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Ordway Hilton

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PROOF OF AN UNALTERED DOCUMENT

ORDWAY HILTON

The author has been active in the field of handwriting and typewriting identification for the past twenty years and has maintained an office in New York City since 1946. He is President of the American Academy of Forensic Sciences; Police Science Editor of this Journal; and author of the *Scientific Examination of Questioned Documents* (Callaghan & Co., Chicago, 1956) as well as numerous articles which have appeared in this and other leading technical journals. This paper was originally published in *Kriminalistik* (Nov. 1958), having been translated into the German by Dr. Alfred Kraut of München, Germany, and appears in this Journal by special arrangement.

Many alterations and changes in documents can be detected, often by a single key test. Visual, ultraviolet, infrared, or chemical tests may disclose erasures. Differences in pens, inks, or pencils, or an improper sequence of intersecting strokes, or of strokes and folds, may reveal additions. So may crowding and abnormal alignment. But what is necessary to establish conclusively that there has been no change? Can it be accomplished by a single test, or by a whole battery of them? If a battery, then what tests are essential? When all is done can the document examiner say definitely that nothing is changed, nothing added?

The proof that a paper is unaltered is a challenging problem. It is an important one for here the document examiner must support the genuine. In most circumstances this proof is essential to maintain the validity of a disputed document.

Unfortunately, there is no single test which will establish the unaltered status of a document. Genuineness, that is the state of being unaltered, is only proven by showing that there has been no alteration, or more specifically that no fraudulent act has been committed. What actual tests need to be made depends upon the document and the changes which may have or are alleged to have been made. Let us consider the all inclusive question: "Has there been any change or alteration in this document?" What factors must be considered?

HAS ANYTHING BEEN ERASED?

If there has been no alteration, then certainly there must not have been any erasure. But how can we be sure of this? The answer depends on how the document was prepared and how an erasure could be affected. From this starting point we must apply those known tests which will reveal an erasure and obtain a negative result in each.

Handwritten Document. Whether the document

is pencil written, prepared with fluid ink and nib pen, or produced with a ball pen determines how an erasure might be effected. Abrasion, rubbing with a rubber, can be used to remove any of these writings, but this is the only way that ordinary pencil writing can be taken off the paper. Fluid and ball pen ink may be chemically bleached with such reagents as hypochloride for fluid ink for example.

The first step with any suspected erasure is to examine visually the suspected area under various controlled lighting conditions. Some magnification is usually desirable. Are there any traces of partially erased writing? Does oblique lighting show any indentations especially from pencil or ball pen writing? Are there disturbed paper fibers or is the sheen or reflective quality of the paper surface different in the suspected area? Skillful erasing may not disturb the fibers, but still the effect of rubbing with a soft rubber eraser may change the reflective qualities of the paper surface. Clumsy erasing may rough the surface badly or even wear the paper thin. The latter condition could most easily be detected by holding the sheet between the light source and the eye. If chemicals have been used, slight stains have been known to be present in the suspected area. Not only the face, but also the back of the sheet should be examined for here the pattern of embossing may be the first indication of tampering. Besides oblique light examination study in subdued daylight (north light is ideal) is part of the preliminary steps in these cases. Dull, overcast days are helpful in making these examinations, but adjustable venetian blinds or shutters can create comparable lighting in the laboratory.

It is conceivable that a skillful erasure may leave no visual traces, but can still be detected. To be assured that light pencil strokes have not been erased either infrared viewing equipment or

infrared photography should be resorted to. (An oblique light photograph might also be made if any question remains after visual examination.) Infrared while very effective where carbon deposits (pencil or India (carbon) ink) are concerned is of little help with ball pen or fluid inks. However, filtered ultraviolet radiation often discloses the areas in which erasing fluid had been applied and may be helpful in deciphering the erased ink writing. If all these tests prove negative, this is strong evidence that there has been no erasure. However, with pencil or ball pen writing it may well be desirable to treat the back of the sheet with an iodine staining solution used to develop writing impressions to determine if any pressure areas remain from effaced writing strokes. When the original writing was done with an iron base ink, sulphocyanic acid fumes certainly will disclose the bleached ink strokes.

These series of tests do not exhaust the various means of detecting and deciphering erased writing, but are sufficient to handle the various classes of erasures.¹ If all are negative, then certainly we cannot find any evidence of erasures. Are we thus safe in saying that there has been none? Some workers may maintain that there is the possibility of a very skillful erasure. With synthetic dye inks or very weak pencil writing it might possibly be true, but in the vast majority of cases we should be able to state definitely now that nothing has been removed.

Typewritten Documents. To erase typewriting one must either use an eraser, an abrasive one works more effectively than pure rubber, or scratch it out with a knife or razor blade. A few synthetic dye ribbons can be bleached chemically, but carbon inked ribbons are much more universally used. This latter ink is not effected by chemical reagents. Thus, a series of visual and microscopic examinations described under "Handwritten Documents" will reveal almost every erasure. Do not forget that the back of the sheet may show smudges or embossings in the erased area.

With a carbon inked ribbon infrared examination or photography is a further means of testing. Of course, if the typewriter ribbon ink can be

bleached chemically, a filtered ultraviolet examination should be made. In either case the actual typewriting process may have embossed the paper, and while the pigment can be removed by erasing, the remaining embossed outline can be recorded by oblique light photography. This combination of tests should reveal whether an erasure has been made.

There is one other test possible with typewriting if new matter has been written over the erased area. This typewriting should be examined under ruled test plates. It is extremely difficult to realign paper exactly as it was once if it has been removed from the machine. Thus, this further test can reveal tampering in a number of instances. (Even the addition of new material in areas where there is no need of erasing may be detected by these tests, but this is to be considered more in detail subsequently.)

If there has been no erasure, each of these tests must so indicate. It is the accumulated weight of the series of tests which establishes that the document has not been erased.

Carbon Copy. Tests for erasures in carbon copies are exactly the same as those discussed for typewriting. Not all carbon paper actually contains carbon, but if it does the suspected area ought to be tested by infrared radiation. This type of carbon impression cannot be bleached, but it can be rubbed out with an eraser. Some colored carbons are bleachable; these papers should be examined under ultraviolet light. If a non-carbon-containing carbon copy is rubbed out successfully it may be extremely difficult to determine this fact by any available tests, but usually not all of the original marking substance is removed. In fact small traces are usually very persistent. With any type of carbon paper one can see that it takes a series of tests to establish that there has been no erasure, and under some circumstances it may not be possible to state with absolute certainty that there was not once writing which had been completely removed.

If the original and carbon copies are both available, and both show no evidence of erasing, they should be carefully compared. The fact that the carbon copy is an exact duplicate of the original makes the chance of a skillful erasure so remote that it can be considered impossible. Under these circumstances a very definite opinion can be expressed.

HAS ANYTHING BEEN ADDED?

Documents can be altered very effectively by the addition of words, sentences, paragraphs, or

¹ Other chemical tests for erased ink writing are discussed in the writer's article, "An Evaluation of Chemical Methods for Restoring Erased Ink Writing," *POLICE JOURNAL* (England), Vol. 29, pp. 264-272, October 1956. Photographic methods for deciphering erased pencil writing appeared in the writer's article in the *INTERNATIONAL CRIMINAL POLICE REVIEW*, No. 85, pp. 47-50, February 1955. Also see Chapter 4 of the writer's text, *THE SCIENTIFIC EXAMINATION OF QUESTIONED DOCUMENTS*, published by Callaghan & Company, Chicago, Illinois, 1956.

even pages. The physical make up of some documents—with wide blanks between sections—invite this kind of change, and if we are to state that there has been no alteration, we must be able to establish that nothing has been added after the original preparation and execution.

Have any key words been inserted? We all recognize the effect of a skillfully inserted "not" in a sentence, but many other single word insertions may be just as significant. Is there undue crowding of a word? Is the pen or pencil different? Does the typewriting align properly throughout the page? Are the margins consistent or suddenly irregular? Is the sequence of intersecting ink strokes abnormal? Were the folds of the paper put in before any of the crossing writing? Depending, of course, upon the circumstances surrounding the preparation of the document, these questions will generally be answered negatively when the document is unaltered.

The same series of questions may have to be answered if there is a possibility of one or more sentences having been inserted.

Handwritten Documents. With handwritten documents, microscopic study is the most effective means of detecting additions. The tint of the writing ink in the suspected area must be studied under good lighting conditions and compared with the other ink on the paper. Study of the reflective color or sheen should be made by holding the paper at eye level between the viewer and the source of light. Comparison of both the deepest and lightest strokes in both sections is important. Possibly chemical spot tests or chromatographic analysis may be required to resolve the question. If the writing is in pencil, is the quality of the stroke—its depth and color, fineness or thickness, microscopic comparison, secondary or reflected color, deepest and lightest strokes, depth of indentations—consistent with the rest of the document? There should be no significant variation if the page is unaltered. The quality of the pen strokes must also be uniform throughout the page if there is no addition.

Certainly, the writing must all be by the same person, or there must be a logical reason why more than one writer prepared the page. To be sure of this means study of the writing habits of the suspected words and the balance of the text. Are these words written in imitation of the balance of the writing, that is have they been forged? If by the same writer, is there evidence of writing at different times, under somewhat different writing conditions? Here a study of the embossing or lack thereof on the back of the page may reveal

important evidence. So may the freedom, care, alignment, slant of the writing itself. Significant divergencies in any of these factors may be evidence of an insertion; complete uniformity points strongly to a normal, continuous writing.

When there is a fold across the suspected word or when strokes of it impinge on the words that follow, we may be able to find very concrete evidence that nothing has been altered. For example, if all the writing was done before folding except the executing signatures, obviously nothing was added after execution. If the lines of writing show proper sequence wherever strokes from the upper most line impinge on the next lower, this is evidence of normal preparation and no added writing. Sequence of strokes involve study under the microscope to determine how the ink or pencil writing reacted at points of intersection. Unfortunately, there may be points where no definite determination can be made, but in all instances this question should be thoroughly investigated.

By considering each of these factors in connection with a handwritten document, it may be possible to express a very definite opinion that nothing has been added or at least that there is no physical evidence which would suggest that there might have been an addition.

Typewritten Documents. Additions to any typewritten matter may be detected by consideration of a number of factors. Improper alignment under test plates is a usual defect. Either the vertical alignment is improper, letters are offset slightly to the right or left; or the horizontal alignment varies, the interlinear distance is too great or too small; or the added typewriting is not parallel to the balance of the page. Only the most skillful operator would be able to reinsert the sheet and adjust the paper so that all factors are exactly right, and besides this requisite skill he would need to have exceptional luck! In addition to these problems the type face and machine defects must be studied to be sure that the same machine was used throughout. Visual and chemical tests should be applied to the ribbon impressions. Additions sometime after the original preparation may be disclosed by a different ribbon or a different ribbon condition if a cloth ribbon was in use. If all these physical factors are consistent with a continuous preparation of a typewritten page, certainly we are justified in stating that no addition has been made, or at worst, with the suspected material being a single short word at the end of the line, that there is no evidence which points away from the conclusion that nothing has been added.

Carbon Copy. Again in cases in which we are fortunate enough to have a carbon copy as well as the original, and the two are exactly alike in all details we have very positive evidence that nothing has been added.

If only the carbon copy is under study and the original is unavailable was the same carbon paper used throughout? Is the pigment the same under microscopic and chemical tests in all parts of the document? Is the apparent wear of the carbon consistent? In addition do all the tests applicable to an original document which can be adapted to the carbon copy as well indicate no additions? If these examinations fail to reveal an addition we are generally on very firm ground in stating that there has been none. Remember, if an addition is made to a carbon copy through carbon paper, the writer or typist is "operating blind"; the carbon paper is covering the document while the addition is made.²

HAVE ONE OR MORE PAGES BEEN INSERTED OR SUBSTITUTED?

With the possible insertion or substitution of an entire page in a document all of the factors considered in connection with the additions to handwritten and typewritten documents may apply except, of course, with typewriting there is no test for continuous typewriting from one page to the next. There are other factors though that must also be considered—factors involving the paper and staple holes or other methods of fastening the sheets together.

Absolute consistency between the sheets of paper which make up a multiple page document is strong evidence of normal, continuous preparation of the pages. Is the same kind of paper used for each page? More important is the paper from the same batch or package, that is are its measurements exactly the same? Does it appear the same

² Some skillful typists who are called upon frequently in their work to make corrections or short additions to carbon copies develop a technique which allows them to adjust the carbon copy carefully in the machine and then to type a carbon impression of the new, added material. After adjustment, a small "sandwich" of paper and carbon paper, making up the corresponding number of sheets which lay on top of this carbon during its preparation, is held in place manually while the added words are typewritten through the "sandwich". Only the most skillful employ this technique, and it is one which is best suited for the correction or addition of only a few letters or words. In these instances the carbon impression matches well in its quality and gross alignment, but the latter is subject to the same slight variation in alignment that an addition to the ribbon copy may have. In addition unless the identical carbon paper is used, there may be a discernible variance between the added words and the balance of the sheet.

under microscopic, visual, and ultraviolet light examinations?³ Is its surface texture, look-through, color or brightness, thickness, sizing, fibers, etc., the same? Are there any writing impressions or offsets which connect these sheets with the preceding ones? Consistency in any of these paper factors points strongly toward a naturally prepared document, but do not necessarily establish it convincingly. However, when they occur together with absolute uniformity in pen and ink, pencil or typewriting the opinion can be stated more definitely.

If the pages are stapled together, then all pages should be examined to determine whether there are any unused staple holes in one page which are not found in the others. Marks of other types of fastening techniques which appear in one page, but not in the other may be indicative of a substitution.

A further test should be made on any multiple page document to establish that all of the pages were prepared continuously or that this is the most likely conclusion. Are the margins comparable page after page? Are the indentations for paragraphs and the spacing between lines similar? If handwritten, is the quality of handwriting that of continuous writing or is there some abrupt change in the quality when the suspected substitution is compared with other pages? With typewriting, is the same machine used, is it in the same condition, and does the same ribbon prevail?

Thus, it is clear that to establish that no page has been inserted or substituted a number of factors must be considered. The more factors there are pointing away from the conclusion that there has been a substitution, the more definite an opinion can be stated that none has occurred.

CONCLUSION

An unaltered document is one which contains no erasures, no additions, no substitution of pages. To establish this fact positively and definitely involves consideration of a very large number of factors. In some instances, even after all of these factors are considered, it is not possible to say that the document is unaltered, but only that the preponderance of evidence points away from the conclusion that there has been any change. The facts contained within the document itself govern just how positively the question can be answered.

³ The subject of differentiating between writing papers by ultraviolet light is discussed by this writer in "Pitfalls in the Use of Ultraviolet Examinations to Differentiate Between Writing Papers", *JOURNAL OF CRIMINAL LAW AND CRIMINOLOGY*, Vol. 40, pp. 519-22, 1949.