

Summer 1932

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### Recommended Citation

C. Ainsworth Mitchell, Scientific Documentary Evidence in Criminal Trials, 23 Am. Inst. Crim. L. & Criminology 336 (1932-1933)

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*Editorial Note*—The section which follows has been added to this Journal in order to present to former subscribers of the American Journal of Police Science a department in which they may find material of a type not ordinarily available outside of the pages of that Journal. Articles of a more general nature received as contributions to the American Journal of Police Science will be printed in the sections devoted to "Contributed Articles," and "Briefer Contributions."

Reviews of books in the field of Police Science will appear under the "Book Reviews" section in this and subsequent issues, and notes on subjects of current interest in this field will appear in the "Current Notes" section.

CALVIN GODDARD.

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## POLICE SCIENCE



CALVIN GODDARD, [Ed.]

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### SCIENTIFIC DOCUMENTARY EVIDENCE IN CRIMINAL TRIALS

C. AINSWORTH MITCHELL<sup>1</sup>

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Editor's Note: The following paper was originally read on July 4, 1931, at a meeting of the North of England Section of the Society of Public Analysts. Dr. Mitchell has kindly consented to our reprinting the article as published in the March, 1932, issue of *The Analyst*.

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When your Honorary Secretary (Mr. J. Stubbs) asked me to read a paper at your Summer Meeting, and this request was repeated by our President, I felt that it would be ungracious not to respond, and I, therefore, agreed to give a survey of the scientific evidence which may be based on documents in criminal trials and to illustrate this by cases within my own experience.

Scientific documentary evidence is, of course, circumstantial in character, and it is a common practice for counsel for the defense in criminal trials to decry all circumstantial evidence, notwithstanding the fact that it is often more trustworthy than personal testimony. Apart from that, if it were excluded, there would be few convictions even of dishonest tradesmen, and fewer still of the inveterate poi-

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soner, who is the last person to advertise his intentions or to let his acts be seen.

The rules that govern documentary evidence are the same as those governing any other expert evidence. For example, since the leading case of *Seaman v. Netherclift* (1876), a witness on oath is in a privileged position, whether he asserts that a sample has been grossly adulterated, or that a signature is a forgery. There are also certain judicial decisions which have been given in connection with documents, and are also applicable to scientific evidence in general. For instance, Mr. Justice Finlay, in the case of *Rex v. Henry* (1929), allowed a tracing to be shown to the jury, and in the case of *Rex v. Podmore* (1930) the Lord Chief Justice held that a photograph upon which marks had been made with the object of directing the attention of the jury to certain details in the original document, was admissible, since it went to strengthen the evidence.

Many of the scientific data upon which evidence as applied to documents can be based have been accumulated comparatively recently, and new cases frequently present problems for which no solution can be found in textbooks. These may best be considered under the headings of the various materials, beginning with ink.

#### EVIDENCE RELATING TO INKS

*Differentiation of Writing Inks.*—The first time evidence of differences in ordinary blue-black writing inks on a document was given in this country was in 1907 at the trial of Brinkley (*Rex v. Brinkley*). A forged will was the motive for an unintentional murder (if that is not a contradiction in terms), for the prisoner had tried to poison a man whose name appeared as a witness on the will, but who had stated that he had signed only what he had been told was a petition for an outing. A bottle of stout, dosed with prussic acid, was left in this man's lodgings, where it was drunk by his landlord and landlady, both of whom died. An important point in the evidence was whether the statement about the signing of a petition for an outing in a public-house was true, and accordingly the ink used in that public-house was compared with the ink in the signature upon the will. Chemical tests could not be made, since the President of the Probate Court refused his permission for the will to be touched, but, fortunately, an optical examination was sufficient for the purpose. The ink ("Azuryte") from the public-house contained a particularly brilliant blue dye, which enabled it to be distinguished readily from most other inks in common use at that time; and by first matching the inks on the will under the microscope, and then preparing broad

color bands which could be compared by means of a tintometer, it was possible to demonstrate in court that the ink from the public-house agreed exactly with the ink in the signature on the alleged will, and also that there were three separate inks upon that document. Brinkley admitted this, but tried to explain it away by saying that he had given two bottles of ink to a little girl. He was convicted and executed.

Prior to the war, English ink manufacturers were using a large variety of blue dyes as provisional coloring matters, and this was helpful for distinguishing between different inks, whether by optical or chemical methods (see ANALYST, 1908, 33, 80), but for some years past the Board of Trade has consistently refused to allow any dye-stuffs to be imported for ink-making, with the result that the provisional coloring matter in writing ink is usually the same "Ink Blue" (Soluble Blue), and chemical tests must now be based, in the main, on the different proportions of dye, tannin substances and iron in the inks.

Osborn's comparison microscope, which has been devised since the Brinkley case, is a valuable instrument for comparing colors and recording their Lovibond values, although it is not advisable to attempt to demonstrate its use to a jury; the color-strip method, as used in that trial, is still the simplest way of showing in Court differences of color in inks on a document.

*Gradation of Color.*—The color of an ink will naturally vary with such conditions as the length of time the ink has remained exposed to the air in an inkpot, or the time it was left upon paper before blotting. These points are of considerable importance in judging whether the whole of a given piece of writing was done at the same time, as may readily be seen on comparing successive entries in hotel registers. It was a significant fact that in the case of *Bishop of Lincoln v. Wakeford* (1921) the disputed words "and wife" in the two entries in the hotel book agreed exactly in gradation of tone with the preceding words, "J. Wakeford." It would have been an exceptionally skilful forger who could have twice completed those entries in ink of exactly the correct shade.

*Photographic Differentiation.*—Another optical method of distinguishing between two writing inks, one of which is richer in blue units than the other, is by means of photography on an ordinary "process" plate. When such difference in color is present, two inks which, when examined under the microscope, appear to match one another, may show a pronounced difference when photographed, the

ink richer in red appearing much darker in the print than in the original document. This method afforded conclusive evidence in the case of *Rex v. Cornwallis* (1919), in which a woman produced a letter acknowledging the receipt of £200, with a final "0" added to the amount in a different ink.

A remarkable case in which a photographic reproduction suggested forgery was that of *Hawes v. Skelton* (1924), in which a will was discovered in the pocket of the overall of a woman who was bathing a dog. The signature on this will showed different colors, and had manifestly been re-touched, but the Judge (Mr. Justice Horridge) was not satisfied that these abnormalities were sufficient to condemn the document, and deferred the case for a scientific opinion. The bottle of ink with which the document was alleged to have been signed was produced in Court. It was said to contain a mixture of three different inks bought at a sale, and experiments showed that this mixture was capable of accounting for all the abnormalities found on the document. It produced writing of different colors according to the depth to which the pen was dipped into the ink, and the ink ran badly from the nib, necessitating re-touching of the writing. As a result of this evidence the Judge pronounced in favor of the will.

*Age of Ink in Writing.*—The change of color which rapidly takes place when ink begins to oxidize on paper may sometimes afford proof that writing is recent. Thus, in a claim brought against an insurance company by a clothier for the alleged loss of his stock by fire, it was found that entries in a stock book, which purported to be two years old, darkened perceptibly in the course of three or four days, and must, therefore, have been comparatively recent. The color readings in tintometer units were taken on successive days during the period of the test, and were checked by another observer, so that there was no doubt as to the progressive change in color. But, at best, evidence of this kind is unsatisfactory, since it is subjective in character, and cannot be supported by photographic proof or checked by subsequent examination.

Chemical evidence of the age of ink is much more convincing than color records, since the test can be repeatedly checked, as I have shown in my discussion on the subject (*ANALYST*, 1920, 40, 247). In the case of *Rex v. Pilcher* (1911) special permission was obtained from the President of the Probate Court for chemical tests to be applied to the inks upon a will purporting to be thirteen years old. All the inks on the document readily ran over the paper when treated with reagents, and formed blue smudges, whereas the inks on the

older counterfoils of cheque books of the deceased woman, which dated back for six or eight years, remained practically unaffected by the reagents under the same conditions; hence the inks on the disputed will could not have been as old as its date. After this evidence had been given, Colonel Pilcher confessed that he had uttered the will, knowing it to be a forgery, and he was sentenced to three years' imprisonment.

*Anachronisms in Inks.*—On several occasions fraudulent claims for old-age pensions have been exposed owing to the fact that the entries in family Bibles, produced as evidence of age, were written in blue-black ink containing an aniline dye, whereas aniline dyes had not been discovered at the dates mentioned. Such dyes appear to have been introduced into writing fluids in this country about 1880, but the earliest instance I have yet found in old ledgers was an entry written in 1885.

A more uncommon anachronism was disclosed in connection with two documents in the case of *Rex v. Rogers* (1930). It would need the pen of a Thomas Hardy to do justice to the story unfolded at that trial of a man who had foisted forged documents on to an ignorant old woman, an old-age pensioner, and had received £5 from her. She was a descendant of William Penn, the Quaker, and claimed to be entitled to his estates. The two documents, which she was led to believe would establish her claim, were genuine old parchments, one of which related to a conveyance of land by the Earl and Countess of Yarmouth in 1688. In each instance the name of "William Penn" appeared after the signatures of the other witnesses, and was apparently in the same kind of iron-gall ink which had disintegrated with age, leaving a residue of oxidized iron compounds. But the inks of the William Penn signatures, unlike all other writing on the documents, contained no iron, and when treated with a minute drop of hydrochloric acid, became milky. This was found to be due to silver, which had become brown—in other words, the ink had the characteristics of a silver marking ink. This discovery became still more significant when counsel for the defense asked whether the forgery could have been perpetrated by William Ireland, who was responsible for the wholesale forgery of Shakesperian documents at the close of the eighteenth century. Ireland afterwards wrote a full confession of his methods, and, from the description of his ink, he was evidently using a preparation containing a silver salt.\*

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\* *The Confessions of William Henry Ireland, containing the Particulars of his Fabrication of the Shakspeare Manuscripts* (1805), p. 39. "One of the journeymen, looking at the manuscript, informed me that he could give me a

The answers to the question raised about Ireland were: (1) Ireland did not use a steel pen for his forgeries, as had manifestly been used in the Penn forgeries (Fig. 1); steel pens were not invented until 1808. (2) Ireland confined his attentions to fifteenth and sixteenth century documents; in those days there would have been no motive for producing autographs of William Penn. (3) There were no characteristics in the writing to suggest that Ireland had had anything to do with the forgery, which was a clumsy imitation of the genuine writing, as may be seen by comparison with the signature on one of the genuine Penn documents brought into Court for comparison (see Plate, Figs. 2 and 3).

The prisoner was found guilty of uttering the forged documents, and was sentenced to a term of imprisonment.

*Ink in Creases in Paper.*—The way in which a paper has been folded may be significant especially when there is writing across the fold. If the writing has been added since the folding of the paper, it will sometimes be found that the ink has spread slightly along the crease, owing to the paper having become more porous through a break in the surface sizing after repeated folding in the same place. In a case tried in 1929, a fact of this kind afforded proof that some writing on an agreement was not so old as the document itself.

#### SEQUENCE OF STROKES IN WRITING

The grounds for certainty that a stroke in writing which appears to be on top of another stroke really is uppermost have been discussed in a previous paper (Mitchell and Ward, *ANALYST*, 1927, 52, 580). Briefly the rule is that if one of the pigments in the intersecting lines is a thin film of color, as in stamping ink or blue-black writing ink which has been blotted immediately after writing, it is not possible to express an opinion which line was made first; but, if the pigment is sufficiently dense, as in printing ink, or if a layer of solid pigment forms, as when iron-gall inks oxidize on paper, definite conclusions may be drawn. These conditions were present in the case of

mixture that would resemble old ink much more than that which I had used; and, in consequence of my request, he immediately mixed together in a phial three different liquids used by bookbinders in marbling the covers of their calf bindings. These ingredients, being shaken up, produced a fermentation; when, the froth having subsided, the liquid was of a dark brown color. The young man then wrote his name with this mixture, but it was very faint on the paper; however, on holding it for a few seconds before the fire, the ink gradually assumed a very dark brown appearance. . . . It was with the same ink I afterwards wrote the Shaksperian manuscripts. Their scorched appearance originated in my being compelled to hold them to the fire, as before stated; and, as I was constantly fearful of interruption, I sometimes placed them so near the bars as to injure the paper; which was done in order to complete and conceal them as speedily as possible from any unexpected person who might come suddenly into the chambers." (Cf. Plate, Fig. 4.)

*Rex v. Cohen*, discussed in a former paper (ANALYST, 1920, 45, 252). In another case (*Lonnen v. Lonnen*) a codicil to a will, which two witnesses swore that they had seen signed, was upset by the fact that at two points the writing of the codicil intersected the writing of the signature of the testator, and could be demonstrated by means of enlarged photography to the uppermost, thereby proving that the codicil had been inserted after the will had been signed.

With black lead pencil writing the sequence of strokes can always be determined by the lines of the silver striations (due to the impurities in the graphite or to the added clay), which are seen when the strokes are examined in oblique lighting (see ANALYST, 1922, 47, 379).

#### DIFFERENTIATION OF PENCIL PIGMENTS

Microscopical differentiation of pencil marks is sometimes possible (*J. Soc. Chem. Ind.*, 1919, 38, 381T), but caution is necessary, since wetting the lead or varying the pressure, may alter the way in which pigment is deposited on the paper, and the series of strokes containing approximately the same amounts of pigment must be chosen for the comparison. The differentiation of old graphite pencils from modern composite pencils is usually practicable, however, owing to the fact that the silver striations of the former are irregular and interrupted, whilst those of the latter are like strings of beads.

Chemical tests depend upon the fact that graphites contain widely differing amounts of iron and chlorides, and, in exceptional cases, there is sufficient titanium to respond to a micro-chemical test. Colored pencils can usually be distinguished from one another without much difficulty (see ANALYST, 1922, 47, 385).

#### COPYING INK PENCILS

An outline of the methods by which we may distinguish between the pigments of copying ink pencils on paper will be found in THE ANALYST (1917, 42, 3). There is more scope than with ordinary blacklead pencils, owing to the fact that there are usually three constituents present—koalin clay, violet dyestuff, and blacklead, and that the proportions of these affect the reactions given by the writing. In the case of *Rex v. Wood* (1907), in which charred fragments of paper were found in the grate of the house where a woman had been murdered, it was possible to prove by a series of tests that the pigment on the paper agreed with that of a copying ink pencil in the possession of an artist who was accused of the murder. Ultimately he admitted having written the letter, but was acquitted of the murder.

The possibility of such pigments resisting the action of seawater for some weeks was raised in the case of *Macbeth v. King* (1916), in which the genuineness of a stave of wood with a message supposed to have originated from a steamship, presumably sunk by

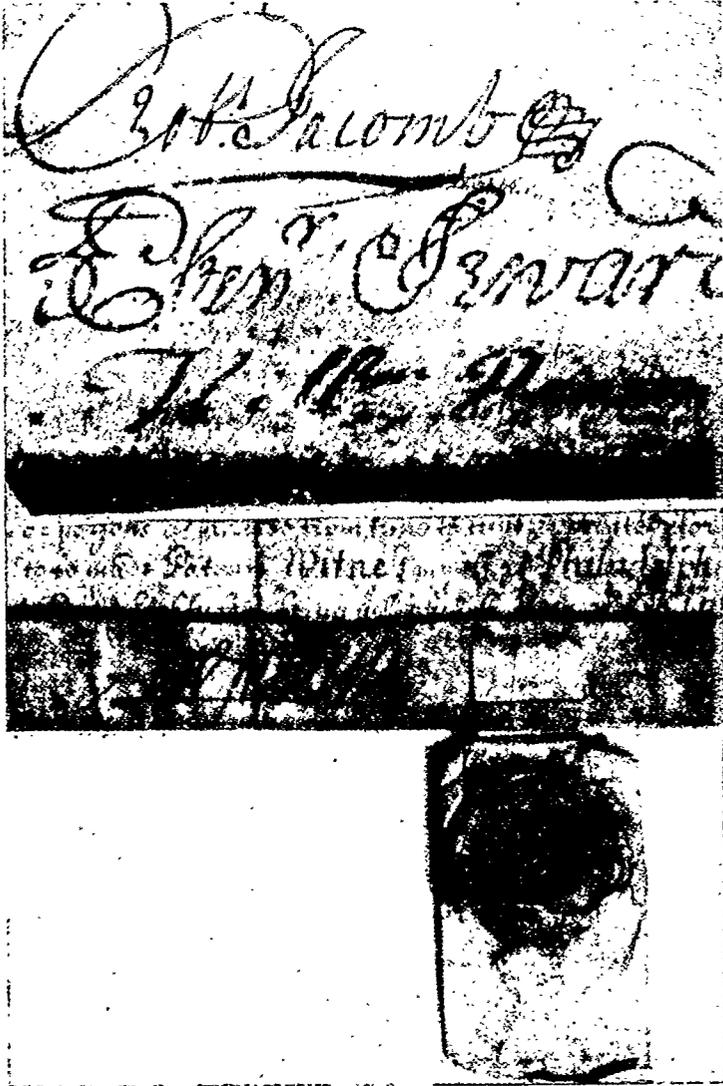


Figure 1 (above) Forged signature of William Penn.  
Figure 2 (below) Genuine signature and seal of William Penn, when Governor of Pennsylvania.



Figure 3. Enlargement of forged signature of William Penn, showing the effect of a steel nib.

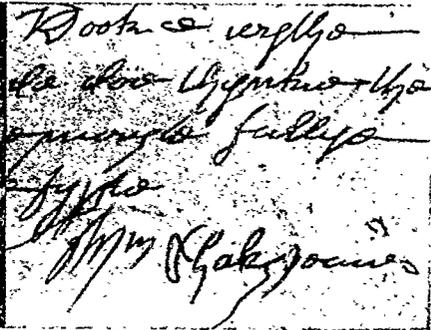


Figure 4. One of Ireland's forgeries of Shakespeare's writing and signature.

a torpedo, was a point at issue. Experiments described to the Court showed that copying ink pencil writing on a piece of oak would not be obliterated by six weeks' exposure to sea-water and air.

The behavior of copying ink pencil writing towards various solvents had to be determined in the case of *Rex v. Podmore* (1930), in which a scrap of paper, about two inches square, which was found behind a barrel in a garage at Southampton where a man had been murdered, led ultimately to the conviction of the murderer. This fragment was caked with dirt and soaked in oil, and had been repeatedly trodden under foot, and the problem was to remove the dirt and oil, without also removing the pigment of the copying ink pencil. After numerous experiments with various makes of copying ink pencil, petroleum spirit was found to be suitable for the purpose, and a message from a man calling himself "W. F. Thomas" was left upon the paper. Until then, it was not known that anyone of the name of "Thomas" (an alias of Podmore) had been in any way connected with the victim.

The use of ultra-violet light made it possible to read much more of this message than could be brought out by an ordinary photograph, but, to avoid any suggestion of the use of the imagination, the evidence on this fragment at the trial was restricted to the words and characters which the jury could see for themselves.

#### INDENTATIONS IN PAPER

Another document of great importance produced at this trial was a leaf from a note-book showing indentations which had, presumably, been made by the pressure of a pencil on another leaf of the book subsequently torn out. By means of photography with the use of oblique lighting to illuminate the edges of the indentations,

words relating to bogus orders, with the initials of "Thomas," were rendered visible, and this formed a further link in the evidence which led to the conviction of Podmore.

#### SECRET WRITING

The search for characters secretly written in a document is usually needed only on special occasions, such as the detection of espionage in war time or irregular communication with the outside world by prisoners. The substances which are capable of being used as invisible inks are almost innumerable, but, broadly speaking, they fall into two classes—those forming a colored compound on treatment with a mordant, and those which become visible when examined by special optical methods such as ultra-violet light. A discussion of the subject will be found in my book, *The Scientific Examination of Documents*, p. 153 (Chas. Griffin & Co.), and in Lucas's *Forensic Chemistry*, 2nd Ed., p. 105 (E. Arnold & Co.),

In the earlier trials of German spies during the war (*Rex v. Kuepferle* (*Times* Report, May 15, 1915), *Rex v. Müller and Hahn*, and some others), the primitive method of writing with lemon juice was employed, and evidence was required to prove that steel pens in the possession of the accused had deposits upon them consistent with their having been dipped into lemon juice, whilst cut lemons gave reactions for iron at points where, apparently, something had been inserted into them. In later trials, more elaborate methods of secret writing were employed, as may be gathered from the story of these spy cases in Felsted's *German Spies at Bay* (Hutchinson).

The knowledge of the use of saliva for secret writing, and of its development with a dilute solution of ink, was common property long before the war (*cf.* Dennstedt and Voigtländer, *Lehrbuch der gerichtlichen Chemie*, 1907, p. 122). In a study of the action of saliva upon iron-gall ink (*ANALYST*, 1920, 45, 256) I have shown that it behaves like an oxydaze, accelerating the oxidation of the ferrous tannate and forming a compound which is distinct from that which forms normally when ink is oxidized by exposure to the air. The process of the development with ink of writing done with saliva thus appears to be partly physical (absorption of dye where the fibre of the paper has been indented) and partly chemical (accelerated oxidation of the ink).

#### TYPEWRITING

Very fortunately it is not generally understood, especially by those who are given to writing anonymous letters, that typewriting can be identified with that produced by a particular machine, with a

much greater degree of certainty than the identification of handwriting. Apart from the fact that each manufacturer uses a different fount of type, which is usually varied in successive models, every machine has its individual faults of alignment and displaced and imperfect letters, by means of which its identity, and, in certain cases, its age, can be established.

The best methods and instruments for recognizing and demonstrating such identity are described by Osborn in his *Questioned Documents* (2nd Ed., p. 437, *et seq.*). Identity in the relative positions of various letters is shown by means of photographs taken under glasses ruled in standard squares, and the typing produced by battered letters is easily recognized, even by an unintelligent jury, when shown in an enlarged photograph. Osborn cites many examples of cases in which the evidence derived from a study of typewritten documents has been incontrovertible, and these might be supplemented by numerous cases in this country. Among the most recent of these is *Rex v. Parry* (1930), in which a former tax collector was convicted of inducing an old man and his wife to make a successful fraudulent claim for the repayment of income tax, by which he also benefited. He denied that the fraudulent returns had originated from his office, but the typing upon them agreed in all its characteristics with that upon admitted letters typed on his machine, and this was one of the facts which led to his conviction.

#### PRINTED MATTER

Much of what we have just been saying about the differentiation of typing applies also to printed characters. The founts used by different printers have distinctive differences, and parts of certain letters tend to become defective with us. Evidence on such points is required when the authenticity of a printed document, such as a passport (*vide infra*), is questioned.

#### SEALS

The methods of forging seals have been already fully described by Türkel in his *Fälschungen*, p. 14 (*cf.* ANALYST, 1931, 56, 141). Photographic methods can be used for detecting such forgeries, and in some cases chemical evidence may be decisive. For example, in the case of *Rex v. Fink* (1911), the defense set up in a case in which a check had been forged was that the forgery had been committed after the check had been posted in a sealed envelope. Chemical tests, however, were applied to the wax of Major Fink and to the seal on the letter, and gave practically identical results for coloring

matter, ash and sulphate, whereas the corresponding fiures given by the wax from the post office where the letter was posted, and by six samples of red sealing wax, bought at random, were totally different.

#### STAMPS AND POSTMARKS

An illustration of information obtainable from examination of the stamp and postmark on an envelope, may be found in a case in which an anonymous letter, bearing a German postmark and registration mark, was received in a London office. Microscopical examination showed that only that part of the postmark upon the stamp was genuine, the remainder of the circle upon the paper having been crudely completed. Ultimately it was found that the letter had originated from within the office, and that the stamp and registration number had been detached from a genuine registered German letter (the receipt for which had been duly signed), and then put on to another envelope containing the anonymous letter, after which the missing part of the postmark had been replaced by hand, probably in India ink.

#### COMPOSITION OF THE PAPER

The composition of the paper on which a document has been written may give useful suggestions, as in a case in 1914, in which the crudely forged notes of an Oriental bank were found to consist of pure flax. This suggested that the forgeries had probably emanated from Russia, as was subsequently found to be the case. Chemical tests, including the difference in the liberation (by the sizing) of iodine from potassium iodide and the determination of the acidity, afforded proof that the forged American passport produced by the German spy, Brekoff (*alias Rowland*), was not genuine, and evidence to that effect was given at his trial in 1915. In addition to chemical differences in the papers, the dyestuffs in the paper seals attached to the two documents were chemically different, and there were differences in the type in which the passports were printed. Among the printing defects was one which could easily be seen by the jury, for in the German version the American eagle had been docked of one of its tail feathers. There were also two other cases in which similar evidence was required.

#### ARTIFICIAL WATERMARKS

The method that is usually employed for fabricating a watermark is to stamp the paper with the required device in a wax medium. Such spurious watermarks can, as a rule, be removed by treating the paper with a suitable solvent, as was found to be pos-

sible with certain notes which were being widely circulated. The fraud can also generally be made manifest by examining the document in ultra-violet light, when the artificial watermark will often show a pronounced fluorescence.

#### CHARRED DOCUMENTS

I have discussed the methods that are in use for deciphering charred documents in previous papers (*Discovery*, 1924, 5, 356; *ANALYST*, 1925, 50, 174). Photographic methods, in which the charred fragments leaves an imprint of printed matter on a sensitized plate, depend upon the fact that printing ink which has been burned produces certain products which reduce silver salts, whereas, charred cellulose has no action. In the communications mentioned above it was shown that different printing inks behave differently in this respect.

The other method of deciphering charred fragments is to continue the calcination further, for which purpose I have found the use of two pieces of wire gauze held in crucible tongs to be the most suitable, since the calcination can be controlled so that a coherent ash of the required color is left. The lampblack of printing inks, being less combustible than the char of paper, is left in its original black characters on white ash, whilst the alumina forming the bases of colored printing inks remains in white on dark gray or blackish ash. Ordinary writing ink leaves a brownish residue of iron oxide, and the graphite of black lead pencils and of copying ink pencils can be obtained as a residue on either white or gray ash.

The reason why so little writing was visible in the charred fragments in the Wood case (*supra*) was that the pigment of the copying ink (Swan) pencil which had been used contained no graphite.

This calcination method was found effective in a case in 1923, in which it afforded confirmation of the statement of a prisoner that he had accidentally burnt a bundle of bank notes of high value (*cf.* *ANALYST*, 1925, 50, 178). Experiments made at that time showed that banknote paper contains so little filling material that it would be quite possible for a bundle of notes to be burnt and to leave very little coherent ash.

#### EVIDENCE ON HANDWRITING

The Podmore case and others brought up handwriting identification. Sooner or later every chemist who undertakes the scientific examination of documents will be faced with the difficulty that his work must be incomplete unless it also deals with the examination of the writing on the documents; in fact, the Government Analysts of several

of the Dominions and Colonies have been compelled by circumstances to take the subject of handwriting into consideration. In the interests of justice this is a move in the right direction, for much of the obloquy attaching to handwriting experts has been due to the fact that the earlier experts were frequently trained observers of minute detail (some were engravers), but they had not had a scientific training, and thus were prone to draw deductions which were not warranted by the observed facts. For instance, it was not uncommon for a handwriting expert to swear positively in the box that a given piece of writing was written by a particular person, whereas all that his observations justified was the inference that the characteristics of the writing agreed in form or writing habit with those of that person. Hence, when (as sometimes happened) it was found that more than one person shared those characteristics, a mistake had to be admitted, and discredit was brought upon the whole system of comparing handwriting.

Essentially, the judgment of handwriting is an analytical process, and depends upon the same fundamental rules of inductive logic (isolate, vary, measure) as are used in chemical analysis, but it is only exceptionally that a categorical conclusion can be drawn. The real value of the evidence is that it assists the Court to decide in which direction the balance of probability lies. For example, in the Podmore case the demonstrable facts were that the characteristics of the writing on the dirty fragment of paper and of the indented writing in the order book agreed with those of admitted writing of the accused. If it was not his writing, either it must have been a deliberate imitation of it, or there must have been two persons writing in exactly the same way and having the same initials, in the garage at Southampton at about the same time. It was for the jury to decide to what extent such a coincidence would be probable.

Or, again, in the case of Archdeacon Wakeford, the writing in the hotel register of the disputed words "and wife" agreed in all respects with admitted writing, even including the formation of a straight stroke as a sign for "and"—a habit which, until it was discovered in a volume of his manuscript, was unknown to those best acquainted with him. The only possible conclusion, other than that the writing was that of the accused, was that it was the work of an abnormally skilful forger, and it was then for the Court to decide whether such a forger could have been present at the hotel on two unexpected occasions, and could have added the words in such a way as to give the correct color tones of the inks, as well as to reproduce the exact formation and style of the genuine writing.

## TRACED FORGERIES

Only in exceptional instances is it possible to state a conclusion in more positive terms than has been indicated, for example, in the case of *Beckerkunst v. Cohen* (1929), in which a forged will was produced, signed in an abnormal way by a woman whose condition was proved by medical evidence to be such that firm writing such as that of the signature in the document would have been impossible. In this case the results of comparison of the signature on the will with other signatures of the deceased woman supplemented the medical evidence, but there are instances when the evidence of documents by themselves may be conclusive. For example, in the case of *Rex v. Henry* (1929) a will was produced in terms which were practically identical with those on a draft of the will produced some months previously and then photographed. The formation of the works and their coincidence in position on the paper were explicable only on the assumption that one was, in part, a tracing from the other. When, subsequently, the production of the draft was again required, a third document, purporting to be this draft, was produced. This differed materially from the original draft, which had been photographed, and the space left where a piece had been cut from the edge of the former differed in size and shape from the corresponding space cut out in the latter; this space might have become larger in the interval between the times when the production of the draft will was demanded, but it was an impossibility for it to have shrunk.

On rare occasions the model which has served for a tracing may be discovered, and when it is, it may convert probability into certainty.\* The classic instance of this type of forgery is the American case of Rice-Patrick, in which the signatures on four pages of a will agreed so closely with one another, that it was obvious that they must have been tracings, since no one would reproduce all the lines of the words in practically the same relative positions (see Osborn, *Questioned Documents*, p. 293).

When considering indications of tracing, there is one possibility which must not be overlooked. Solicitors sometimes indicate, by pencilling in a name, the place on a document where the signature is required, and sometimes a client whose intelligence is not of a high order will attempt to copy the pattern. In the case of *Oliver v. Oliver* (1930) there were features in a signature which, had they been in a

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\*In the case of *Rex v. Brown* (1931), which was *sub judice* when this point was mentioned, a signature showing indisputable indications of marks made with a dry point was found, and the coincidence of this signature with one on the document in dispute was conclusive evidence that the latter was not genuine.