SCIENTIFIC DETECTIVE WOULD END EXPERT TESTIMONY

Head of Scotland Yard's Bureau of Identification Urges Training of Sleuths---What Finger Print System and Blood Study Have Done.

GEN. BINGHAM, when Police Commissioner of Greater New York, once said to the writer of this article: "You may take the uniform off an efficient policeman, put him in citizen's dress, and exchange his 'gum shoes' for patent leathers, but you do not necessarily or even remotely make a detective out of him."

C. Ainsworth Mitchell, the head of the Identification Bureau of Scotland Yard, is evidently of the same opinion. He has made an elaborate plea for the scientific education of detectives, which he calls "Science and the Criminal" (Little, Brown & Co.) At the threshold of his volume, he writes:

"Under the present conditions the rank and file of the detective force, recruited, as it is, from the best of the uniformed policemen, contains many men of acute intellect and reasoning capacity, but it cannot be doubted that in many cases their efficiency would have been enormously increased by a scientific training."

The author asserts that if detectives were only trained scientifically, not merely in logic, so as to reconstruct a crime with proper attention paid to theory and fact, but also in chemistry, physics, and other sciences, there would be less need of expert testimony at criminal trials, which, after all, is ex-parte since the expert is never engaged by the prosecution or the defense without his views already being well founded on the evidence known to him.

Mr. Mitchell reviews the history of crime in England through the centuries, showing where miscarriages of justice as well as cases where justice was cheated were due to a lack of knowledge if not of intelligence on the part of detective operatives. He has great respect for police dogs and for wireless telegraphy as used for the first time in the Crippen case, as well as for photography and a scientific knowledge of chirography in order to detect forgeries, and of inks for the same reason. The only absolute method of identification of persons is by means of finger prints.

Even the trained eye and ear are liable to be deceived, and he cites the case of twenty-five students who witnessed a short drama and were asked by their professor to write a detailed description of the characters and incidents, hardly any two of which agreed in details that would have been vital on the witness-stand.

The fallibility of identification by eye-witnesses was strikingly demonstrated at the trial of Benjamin Bates and John Green at the Old Bailey in 1776, on the charge of burglary.

The house of James Penleage had been broken into, and plate to the value of four or five hundred pounds had been stolen.

Mrs. Penleage swore that four men had entered her bedroom, one of whom carried a dark lantern; that two of these men came, one on each side of the bed, and held pistols to her head, and that of these men, of whom she had a perfect view, she recognized one as Green and the other as Bates.

Her husband testified as to the house having been entered, and as to his loss, but stated that as he was nearsighted he would not swear to the men, though he believed Bates had presented a pistol to his head.

Evidence was also given by a servant and by another woman, and notwithstanding the good character given to the prisoners by a number of witnesses, the jury brought in a verdict of "guilty."

The newspapers of the day called attention to the inconclusive evidence of identification, and as a result the prisoners were respited from month to month.

At last another man, who was executed in the country, confessed that he had also been the author of this burglary at the house of Penleage, and that the two men who had been convicted had had nothing to do with it. In consequence of this Bates and Green received a free pardon, but not until they had been in prison for many months.

A contemporary comment upon this trial richly warrants quotation: "On this occasion Britons have cause to triumph in the liberty of the press. If newspapers had not been printed in this country the lives of two honest men would have been sacrificed to the rigor of the laws, yet no party concerned have been the least to blame. The ways of Providence are mysterious; casual circumstances frequently produce great effects; and a life may be saved or lost by an accident apparently beneath the notice of a common observer."

In the famous Maybrick case, where an American woman was accused of poisoning her husband, Mr. Mitchell arraigns the expert toxicologists for both prosecution and defense as extremists who wished to establish a theory—all of which would have been superfluous had the detectives first employed upon the case had sufficient training in chemistry to know that certain articles of commerce contain arsenic in small quantities.

He also condemns the successive Home Secretaries for declining to grant her a pardon, as her guilt was far from being established beyond reasonable doubt. Their action, he adds, is impossible to defend from a logical point of view.

If the prisoner was guilty of murder, there was no justification for yielding to the popular demand. If, on the other hand, there was a reasonable doubt as to whether the man died from the effects of arsenic, she ought to have been set at liberty. But to commute the sentence for the reason given was to convict the prisoner of attempted murder, a charge upon which she had never been tried, and for which, if found guilty, she would not have received penal servitude for life.

At the present time a case of this kind would be brought before the Court of Criminal Appeal, and the prisoner would have the opportunity of having the alleged misdirections of the presiding Judge investigated, and of putting forward additional evidence—advantages that were not available to the accused in this trial.

In connection with this may be mentioned what the author has to say about the adulteration of food, both as an obstacle to investigation in poison cases and also as a crime in itself. "In the worst forms of adulteration," writes Mr. Mitchell, "the adulterator more than deserves the title of criminal," although the adulteration in question may not cost the individual much either in health or pocket, yet, "the loss suffered by the community collectively through various forms of petty frauds of this nature reaches an enormous total every year." He agrees that legislation is doing much to remedy this evil, and that policemen should be acquainted with every form of food adulteration, and should do their best to enforce the laws even to the extent of personal inconveniences to themselves. And he states the case of an ambitious Chief Constable in Merionethshire, who, a few years ago, after a personal investigation of edibles sold in his district, put up the following notice on the doors of every shopkeeper:

ALL GOODS SOLD
HERE ARE ADULTERATED.

The adulteration panic, however, may be carried to a reductio ad absurdum, as in the following case:

There is thus considerable excuse for the amusing blunder made by a counsel who was cross-examining Mr. Siemens, the electrical expert, in a case in which there was a dispute about the working of some electrical plant.

"I think, Mr. Siemens, that you have had a long experience in connection with electricity?"

"That is so."

"Well, now, I want you to tell me whether in the course of all your experience you have ever known electricity to be adulterated?"

"In only one instance," replied the witness.

"And when was that?"

"In the phrase 'greased lightning,'" was the instant witty reply of the electrical expert.

But there are few commodities which can be bought or sold that have the clean record of electricity. In every direction competition is daily becoming keener, and rival firms "cut" the prices, each forcing the other to sell either with the minimum of profit or to stop selling altogether.

Almost as important for identification purposes as the finger print is that of human blood, and, although up to the present day the individual himself may not be identified by his blood, human blood is readily isolated from that of the lower animals.

The number of corpuscles present is also subject to great variations, the blood of amphibia and reptiles, for instance, containing remarkably few. The following numbers in 100 parts of the blood of different animals have been recorded: Horse, 73; pig, 63.5; ox, 35; dog, 35.7, and man, 48 corpuscles.

The color of blood is due to a compound known as haemoglobin, which constitutes about 40 per cent. of the substance of the corpuscles. In the bright red arterial blood the haemoglobin is present in the form of oxyhaemoglobin, and the latter may be separated in crystalline form by suitable treatment of the separated red blood corpuscles. These crystals differ in the case of different animals, both in their chemical and physical characteristics, and have very different forms.

Mr. Mitchell cites several cases in which, had the identification of human blood been known many years ago, miscarriages of justice would not have occurred. He gives various examples of the positive test of the presence of human blood, but declares that the results of the new negative test are much more positive.

Thus on the first occasion in which evidence was given as to the results of this test, which was in a criminal case in France in 1902, the prisoner had asserted that certain incriminating stains had been caused by the blood of a rabbit.

A serum specific for rabbit's blood serum was therefore prepared, and the stains dissolved and tested. No sign of precipitate was obtained within thirty minutes after applying the test, and evidence was therefore given that the stain certainly did not consist of rabbit's blood. On the other hand, a serum-made specific for human blood gave an immediate precipitate with the solution of the stain, which, therefore, in all probability consisted of human blood.

Although this method of testing blood stains has been used on the Continent for several years, it is only within the present year that it has been employed in a criminal case in Great Britain.

Apparently the first occasion was in the recent trial of Mark Wilde for the murder of Mr. George Storrs, a mill-owner, at Gorse Hall. Evidence was given that old stains were present upon the outside of the sleeve of the prisoner's blue serge coat, although they were not visible to the naked eye. These were found to consist of mammalian blood, and the serum test for human blood gave a positive reaction. It was, of course, impossible to form any idea as to the age of the stains, and the witness, Dr. Wilcox, refused even to give an estimate upon this point.

calf has the same structure as that of the cow.

Mr. Mitchell also points to errors that have been made in identification by persons who were expected to know the physical characteristics of persons with whom they were intimately acquainted. He ascribes such mistakes to the credulity of human beings who will accept any story. But for this the notorious Tichborne case, which dragged on for years, would have been settled in a few days. It is difficult now, recalling the facts, to understand how any one could have believed in the identity of the butcher, Arthur Orton, with the missing heir to the estates, Roger Tichborne. The latter was of a slim build, while the claimant was a couple of inches taller and weighed twenty-five stone. The real Roger had had the education of a gentleman, while the claimant could neither write nor speak correctly.

Yet, notwithstanding the enormous dissimilarity in appearance and manners of the two men, the mother of Roger Tichborne recognized Orton as the son whom she and every one had believed to have been drowned when the ship was wrecked. When he came to England to see her he had thought it prudent to feign illness. Lady Tichborne, therefore, went to see him, and he got on the bed and turned his face to the wall. His adopted mother, however, recognized him by his "ears so like his uncle's."

This must have been an instance of self-deception, for there was evidence that the lobes of the ears of the two men were absolutely different.

It was this recognition, however, that encouraged Orton to persevere with his claim to the estates, and assisted in aiding the recollection of other people, who swore that he was Roger.

In dealing with the "systems" of identification the author points out that at the present time photography, although important, would, as hitherto, prove insufficient without an additional system. And it is in connection with that of Bertillon that it has given the best results, for, as is well known, the portraits of the criminals and their measurements and physical characteristics are arranged according to the size of the individual—his body, his head, the width of the body from finger tip to finger tip with arms outstretched, &c.

But he gives the laurel to the finger-print method of identification. At first it was used as a personal mark to give authenticity to a document, being used by the Assyrians on bills of sale, &c., later by Egyptians who caused criminals to seal their confessions with finger nail marks. Imprints of nails may be found on Chinese coins, and there is a tradition that an early Empress had accidentally pressed her nail into a wax model of a coin, since when she has been imitated as a compliment. But these Chinese have also made their criminals make impressions of their finger tips as a record of their convictions.

The first attempt by Europeans to make use of the characteristic ridges of the fingers to record the identity of individuals was that of Sir William Herschel, who introduced a method officially into Bengal.

His system arose out of the difficulty of checking forgeries by the natives in India, and his having made two of them record their finger impressions upon contracts so that he might be able to frighten them should they subsequently deny their signatures.

This was in 1858, and the device proved so unexpectedly successful that for several years Sir William Herschel made a study of the use of finger prints in identification, and finally found them so satisfactory that in 1877 he gave instructions for their systematic use in the Hooghly.

Invariably criminals have been identified by their finger marks.

Dr. Faulds, who while at a hospital in Japan made an exhaustive study of the finger impressions of the Japanese, appears to have been the first to suggest the possibility of tracing a criminal by the imprints of his fingers upon external objects.

He mentions two instances where the method had afforded valuable evidence, and these are worth recording as early examples of the use of the method in detective work.

In one case some rectified spirit had been drunk, and the greasy markings of the finger upon the bottle plainly showed who was the culprit, for their patterns was identical with that of an imprint in Mr. Fauld's collection.

On another occasion some one had been suspected of breaking into a house, but the sooty imprints of fingers left upon the wall proved beyond all doubt that this was not the person.

Finger prints are also inherited, and it has been proved that the finger impressions of two brothers or of a brother and sister have been found to be very similar—more so, in fact, than those of two persons selected at random. Still, the prints can easily be distinguished, even in the case of twins of the same sex, who frequently have the same physical and mental characteristics. Certain observations have also shown that the influence of the mother upon the type of finger print is more pronounced that that of the father.

While finger prints furnish positive proof of guilt, the opposite has been found in the examination of handwriting, and in his chapter on "Identification and Handwriting" Mr. Mitchell explains and illustrates by various cases under what varying conditions handwriting may show alterations and thus lead to wrong conclusions.

More so than in finger prints, heredity plays an important part in the making of handwriting. Besides, the writing may be modified by the results of training and other external influences, adds the author. In comparing the writing of a father and his sons, he explains, one can easily detect the same tendencies toward forming certain letters, while the daughters usually follow the mother. Still, in looking for similar resemblances in the writing of brothers and sisters, there may be seen occasional similarities, but in no case of this kind can one hand be mistaken for that of another.

The normal handwriting of every individual is affected by very many external influences, and by "normal" must be understood the writing that is done when the thoughts of the writer are being concentrated upon what is being written and without a mental sideglance at the form of the writing itself.

In the latter case various psychological influences cause the writing to vary more or less. For instance, the handwriting of an artist may show marked variations at different periods, especially in the form of the capital letters, for the artist usually keeps before his eye the decorative effect of his letters and words, and is constantly making experimental changes in his writing.

In like manner handwriting is often influenced to a considerable extent by subconscious memories of the writing of other people, especially of those whom the writer tries to imitate in other respects. In some individuals this unintentional imitation of other handwriting is so pronounced that they are unable to answer any letter without its characters having some effect upon their own writing.

Conscious imitation is a still more frequent influence upon the form of writing, and some of its effects may become fixed characteristics.

Instances of this are to be seen in the "good" writing of the old-fashioned writing master, whose ideal was a copper-plate engraving of the visiting master, with its thick down stroke and thin up stroke and absolute regularity of letter; in the pointed Italian writing, taught generally in mid-Victorian ladies' schools; in the civil service "hand" set as a standard for securing marks in examination; and in modern commercial handwriting now rapidly giving place to the typewriter.

"Passing emotions," Mr. Mitchell says, "also have their effect upon the handwriting." And he takes Napoleon as an example—"very striking, for instance, is the difference between the orderly signature written after the victory of Austerlitz and the blotted scrawl dashed off after the defeat at Leipsic." And, he continues to explain, signatures written when one is depressed show a downward slant, while happiness causes the opposite tilt to one's letters. Disease, too, shows in the handwriting, and different diseases have different effects on the formation of the letters.

But the best proof of the way in which the condition of the mind alters the handwriting, says Mr. Mitchell, is when a person is in a hypnotic state.

The experiments of Profs. Lombroso and Richet have proved that a suggested change of personality is accompanied by an appropriate style in the handwriting of the subject. Thus, a young, hysterical girl, when hynotized under the suggestion that she was a child, wrote in childish characters.

Still more striking were their experiments upon a young Austrian student, Chiarioni Clericentino, who within little more than an hour was made to assume successively the characters of a child, of Napoleon, of Garibaldi, of a clerk, and of an old man of ninety. He was made to write some words on each of his assumed characters, and the writings not only differed to a marked extent from his normal handwriting, but also had characteristics suggestive of the type of individual he was temporarily personating.

The handwritings of the suggested Napoleon and Garibaldi were quite different from the writing of the real individuals, although it is interesting to note that there is some attempt to form the letters of Garibaldi's signature in the same manner as in the genuine signature.

In a private letter to the present writer Lombroso mentioned that it was quite possible for the hypnotized student to have been familiar with the signature of Garibaldi. Or, again, the hypnotizers may have had their thoughts upon the form of the genuine signature while the student was writing the suggested version of it.

The author quotes Dr. Preyer to the effect that certain individuals, when under hypnotic influence, write in a better handwriting than when they are in a normal condition. He says:

"It is even possible to make them omit by suggestion particular letters from each word they write, 'Europe,' for instance, becoming 'Urop,' and so on, while by further suggestion they may be made to make use again of the missing letter.

"The fact that handwriting may be completely altered under the influence of hypnotism is not only of great scientific interest, but may also have an important bearing on the results of legal cases in which handwriting is concerned.

"It was pointed out some years ago by Dr. Bianchi that hysterical women are particularly prone to write anonymous letters, and it is well known that such women are readily responsive to hypnotic suggestion.

"Facts such as these suggest how necessary it may often be to take into account the possibility of hypnotic influence before deciding upon the authorship of a given piece of writing.

"The extent to which a man should be held responsible for what has been written as the result of hypnotic suggestion from another person will obviously depend upon whether he was the dupe or the willing instrument of the hypnotizer. In any case it may not be easy to prove that the writing is his, for it will probably be very different from his ordinary handwriting.

"Hitherto no case of criminal libel involving such delicate questions as these appears to have come before the courts, but it is one that might conceivably occur at any time, and a jury would then have to decide upon the responsibility of the writer.

"In order to be a successful detector of forgeries, a detective should not only know the different schools of chirography as well as the psychology of handwriting, but he should also know the chemical composition of inks and how to use a microscope.

"Cases in which it is necessary to distinguish between iron-gall writing inks and printing or other carbon inks occur from time to time in criminal investigations. As a recent example a case that was tried a few months ago may be mentioned. The chief clerk of a firm of merchants had for a considerable time been defrauding his employers, and when suspicion at length fell upon him he endeavored to conceal his doings by falsifying the entries of previous years in the ledger.

"In order to do this it was necessary to abstract certain pages in a particular part of the ledger in entirety with the necessary alterations. Then, finding that the ink of the writing would appear too new, and thus invite inquiry, he added a small amount of Indian ink to an ordinary writing ink, and thus obtained a mixture which gave an immediate effect of age to the writing. To the naked eye there was nothing to show that these pages had not been written on the dates mentioned on them, three or four years previously, but on applying a weak bleaching agent the fraud was at once made obvious. The iron-gall part of the pigment faded away, but the particles of carbon that had performed the basis of the Indian ink were left, and their nature could be easily recognized under the microscope. The entries on the other pages in the ledger, which had been written in ordinary writing, were completely bleached in the test."

A very curious illustration of the difficulties that beset the forger of ancient documents was afforded by the trial of Humphreys in 1830 in Edinburgh.

The prisoner was the claimant to the earldom of Stirling, and in support of his claim had produced a number of documents supposed to date back to the seventeenth and early eighteenth centuries. One of these purported to be a portion of a charter granted by King Charles I. to the first Earl of Stirling in 1639, permitting the succession to the earldom to descend through the daughters of the house.

As witness to this there was appended the signature of Archbishop Spottiswood described as "our Chancellor," whereas as a matter of history the seal had been handed to the Marquis of Hamilton a year prior to the date of the pretended charter. There were also various other anachronisms in the documents.

Scientific evidence was also given that the ink upon the pretended charter was not old ink, but ink that had been treated in such a manner as to appear old.

Similar inconsistencies were shown in the other pieces of documentary evidence, and scientific proof was given that the date upon an engraved map, upon the back of which were memoranda supporting the claimant's case, had been added at a later period.

The jury unanimously found the prisoner guilty of forgery.

But, of course, the great arm of the detector of forgery is the microscope.

For instance, a letter may have been so carefully erased as to defy detection by ordinary examination, but a microscopical examination will show the slightly roughened surface of the paper, where the fibres have been disturbed in the process of erasure.

In one of these cases, which was settled before it reached the courts, a letter which was to be put in evidence in a dispute as to some property had originally contained the words "your house," but the "y" had been skilfully erased, so that the words read "our house."

When the paper was held to the light it showed an almost imperceptible thinness at that place, but under the microscope the ruffled fibres on the surface of the paper where the sizing had been scratched off, were very noticeable.

Skillful forgers guard against this obvious sign of alteration by treating the erased place with a solution of resin in spirit, which leaves a fine, shiny layer upon the paper similar to that of the original sizing.

A treatment first with hot water and then with alcohol will remove this coating of glue or resin, and when the paper has been dried again it will be found that this part, which will now be free from its protective layer, will absorb a drop of water more rapidly than the rest of the surface.

Another simple test to reveal erasure is the use of iodine vapor, which will often give a blue coloration (due to starch) with the moistened surface from which sizing has been removed, but will only color the remainder of the paper brown.

This test gave a very pronounced result in the examination of the letter to which reference has been made, in which erasure of the letter "y" had been suspected from the general appearance and microscopical examination of the surface of the paper.

There is a liability to mistake the nature of the handwriting expert, declares Mr. Mitchell, and it is heard in several quarters that such evidence should be no longer admitted as expert.

It is now no uncommon occurrence for a Judge in summing up a case to the jury to emphasize the point that the evidence of the expert is only a matter of opinion, and that the real decision rests with them. In this way it is possible for the Judge to correct the too decided statement of opinion which the expert is sometimes under stress of cross-examination forced to give.

Nethercliffe, who was the chief expert in the days when Lord Brampton was at the bar, had such faith in his methods that finally he came to believe that he could never make a mistake.

This belief received an amusing check in a case in which he was under cross-examination by Lord Brampton (then Mr. Hawkins.)

Nethercliffe had claimed that his system gave infallible results, and had further stated that his son, whom he had trained, made use of the same system.

"Then," said the wily advocate, "your son working on your system is as good as you are?"

"Yes," replied the father with some pride in his voice, "he is."

"That is to say he, too, is infallible?"

"Yes," again replied the witness.

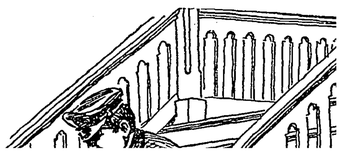
"Well, now, Mr. Nethercliffe, was there ever a case in which you and your son appeared on opposite sides?"

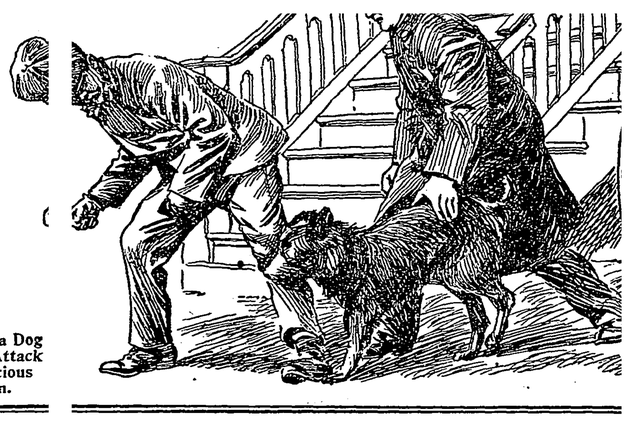
Nethercliffe tried to evade the question, which, he complained, was an unfair one, but on being pressed was forced to admit that on a certain occasion he had given evidence on one side and his son upon the other.

Swift came the unanswerable retort, "How comes it, then, that two infallibles appeared on opposite sides?"

Nethercliffe's dogmatic manner rendered him peculiarly liable to fall into traps like this, and many were the occasions on which he was found trapping.

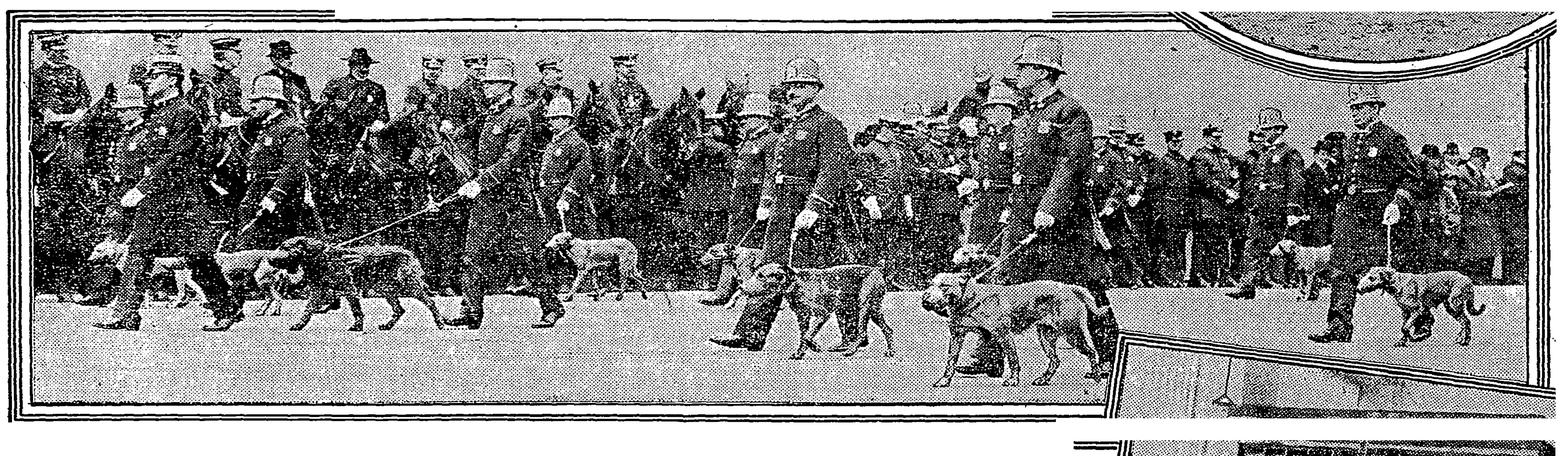
The whole range, scope, and aim of Mr. Mitchell's book is to demonstrate the necessity of the scientific detection of crime by having placed upon the detective force not merely policemen trained to observe and to make deduction and establish a hypothesis on the facts presented, but to have men of scientific training who shall know the value of certain evidence which now is left to the experts at the trial. Such scientific testimony, he declares, is merely another form of circumstantial evidence, to which custom has applied the term "expert." Yet, who is an expert? The best way is to have all scientific material thoroughly sifted by detectives, so that expert evidence shall have the value of individual opinion at the trial and no more, for expert evidence in the hands of experts at the trial may be made to reveal anything.





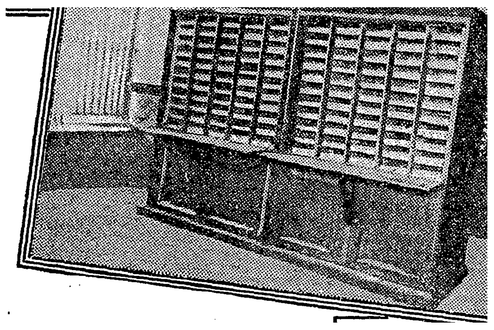
Teaching a Dog How to Attack a Suspicious Person.

Police Training Dog.

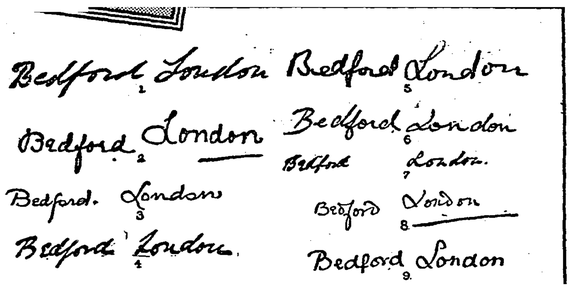


Police Dogs in Parade.

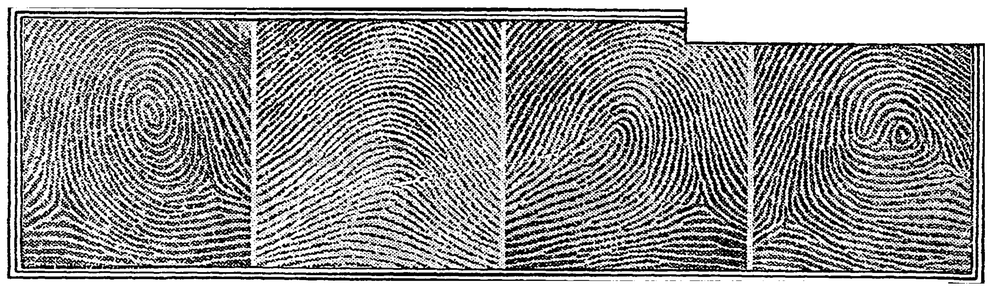
Protecting His Side Partner.



Cabinets at New Scotland Yard in Which Finger Print Forms Are Filed.



Heredity in Handwriting.



The Whorl Type of Finger Print—The Arch Type—The Loop Type—The Composite Type.

The New York Times
Published: July 2, 1911
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