

Copyright 1935

By

Small-Arms Technical Publishing Co.

First Printing, 1935

Second Printing, 1940

Third Printing, 1942

Fourth Printing, 1943

PRINTED IN U. S. A.

FOREWORD

Publications on the identification of firearms, a subject so vitally important to modern law enforcement and prosecution, have in the past been inadequate in scope, and consisted largely of scattered articles, published in the various peace officers' and technical journals, each article dealing with only a limited phase. Further, these articles were always difficult to obtain, and more difficult to search for some desired point.

Hence Major J. S. Hatcher's book, "Firearms Identification," is particularly welcome, and a pre-reading of its chapters indicates that he has produced just what I was confident he would, a comprehensive, accurate treatise.

Major Hatcher is well able to produce an authoritative book, for he has long been recognized as a conscientious, capable, and scholarly expert. I am proud that he has co-operated in the work of the Federal Bureau of Investigation by serving as a member of its training school faculty, giving newly-appointed Special Agents the benefits of his theory and practice. The manner in which these men have grasped his instruction shows that he not only knows the subject of firearms identification, but can present his ideas well.

By its meticulous emphasis of every important detail, this book should do much to discourage that dangerous practice of recent years wherein law enforcement agencies purchase microscopes and expect the fingerprint experts in their departments to overnight become experts in the analysis of firearms evidence, and to carry on such work in their spare time. At the same time it should do much to impress upon these law enforcement agencies the great importance of the proper evaluation of firearms evidence in criminal cases by an impartial expert who devotes his full time to mastering the intricacies of this science. Expert testimony on the subject has been sufficiently tried in the courts to clearly establish its value when prepared by an honest technician, fully qualified in the science and appreciative of its limitations when the quantum of available data concerning the evidence is not sufficient. In crimes where firearms have been used, expert analysis of the re-

sulting evidence is as essential to the investigation as the questioning of witnesses or any other phase of the inquiry made by a thorough investigator.

Major Hatcher's volume will be welcomed by both the conscientious student and the expert. The orderly arrangement of his material seems admirably suited, either as a logical sequence of study or for ready reference by the expert. In readily understandable statements he explains much of the bewildering terminology descriptive of the great variety of ammunition and weapons which are now, or have been on the market in recent years. From years of association with, and research into the many ramifications of the entire subject of firearms, the author is particularly well qualified to arrange the problems in a logical order and to properly determine the amount of attention best given to each.

Although indisputably a technical treatise, the book makes tremendously interesting reading and should be particularly fascinating to that great army of "gun cranks" who find the study of firearms and their loads an intriguing hobby. The Judiciary will find it an instructive reference work and an authoritative one.

J. EDGAR HOOVER,

Director.

INTRODUCTION

In cases of death by shooting, it frequently happens that the life or liberty of a suspected person may depend entirely upon the ability of the authorities to determine what kind of weapon did the shooting, or whether a fired cartridge or bullet involved in the fatality did or did not come from a certain gun. The knowledge of firearms and explosives and how they act, that is possessed by the public at large, including most peace officers and members of the legal profession, is so meagre that almost unbelievable mistakes in testimony vitally affecting the guilt or innocence of an accused person are continually occurring.

During the past twenty or more years, the author has had occasion to observe many instances in which the apprehension of some individual responsible for a crime with firearms or explosives has been delayed or rendered impossible by the lack of even a small amount of knowledge of the right kind by the detectives or police who made the investigation. He has observed other instances in which attorneys, courts and juries have been imposed on or misled by insufficiently informed or unscrupulous individuals who have managed to qualify as expert witnesses on firearms. The unfortunate fact that members of the legal profession may have been imposed on in this manner is small cause for wonder, in view of the fact that the subject of firearms and explosives is a large and highly specialized one, the many technical details of which can ordinarily be known only to those who for some reason have had experience with firearms and studied them extensively.

Thus a practical knowledge of guns and explosives is of immense value in certain phases of police and legal work, but it is not all that is now required, for modern methods of cartridge and bullet identification depend upon highly scientific methods involving the use of the comparison microscope and other laboratory apparatus in the solution of the problem.

With the increasing application of these scientific instruments

and methods, the practice of firearms identification is assuming an ever increasing importance and prestige, and the time has now arrived when no police or detective force can afford to be without its firearms expert; and no trial judge, district attorney, or attorney engaged in the practice of criminal law can afford to be without a knowledge of the principles involved, as well as of the correct firearms terminology. It certainly does not enhance the reputation of any member of the legal profession amongst those of his hearers or possible clients who are acquainted with firearms, to hear him making some of the common errors such as speaking glibly of how the "bullet exploded" when he obviously refers to the cartridge, or to hear him ask if the defendant "cocked the trigger;" and it is highly important for the success of his case for him to know what any expert witness is talking about, and to be able to recognize instantly any inaccuracies in the testimony, or any manifestly absurd statements made by the witness. It may at any time be useful to know what kind of pertinent evidence a firearms expert may be able to uncover, so as to avoid overlooking any possibilities of obtaining material that may be useful to him in presenting his case.

In preparing this book covering both practical firearms investigation and the more advanced and specialized scientific identification of fired bullets and cartridges, the purpose of the author is to be of the maximum assistance to the cause of justice by providing an accurate textbook on these subjects for those who desire to practice this work, as well as a comprehensive reference book for members of the legal profession and others who may have use for such a volume.

Though the author cannot lay claim to any artistic talent, he has endeavored as best he could to illustrate many of the points discussed in his text by the use of free-hand sketches in pen and ink, as these often allow a certain point to be brought out much better than it can be done by a photograph. This is because the very points that it is desired to impress upon the reader can be accentuated by the pen, though the camera might fail to show them at all. In referring to these sketches, the reader should bear in mind that it has been considered desirable to accent or exaggerate somewhat the important points of the illustration, in order to convey a clear idea of what to look for. Sketches such as those of the firing pin imprints on page 260 or of the characteristic marks left on fired cases, shown on pages 261 and 263 are examples. In actual practice, the samples under observation would rarely, if ever, show such pronounced markings as those

indicated in these sketches, especially when viewed by the naked eye.

In preparing his text, the author has purposely omitted any mention of the various things which a criminal may do to his gun, either before or after the commission of a crime, to render the work of identification more difficult. It is fully expected that this book may be criticized by some readers as being incomplete because these questions are not discussed; but it has been considered to be the better policy not to make public knowledge that may be used as an aid in evading justice. Fortunately, the things of this kind that a criminal may attempt will usually enable the expert to know that the arm has been tampered with for no good reason, and this very circumstance in itself carries a presumption of guilt or criminal intent.

Because pistols or revolvers are the weapons that are most often involved in shooting cases, a knowledge of these arms, their ammunition, ballistics and use is essential to a thorough understanding of firearms investigation and identification, and for that reason it has been thought advisable to incorporate in one volume with this book the author's TEXTBOOK OF PISTOLS AND REVOLVERS, which has also been published separately for the use of those who are interested only in shooting. The binding of both of these books as a unit is considered to be the proper and logical procedure, because the worker who becomes to any large extent interested in firearms identification will have constant use for much material not now available except in the TEXTBOOK OF PISTOLS AND REVOLVERS.

Annapolis, Maryland.

February, 1935.

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CHAPTER 1

FIREARMS EXPERTS AND THE COURTS

IT very often happens that the decision in a court case in which shooting is involved depends very largely upon the testimony of one or more expert witnesses of firearms. Sometimes the expert is called by the prosecution, other times by the defense; and at still other times, particularly in the past, before the present scientific and accurate methods of bullet and cartridge identification had been developed, it frequently happened that self-styled "experts" were introduced by both sides, and the court and jury were treated to the spectacle of two supposedly infallible experts disputing each other by giving conflicting testimony, as still sometimes happens in cases involving handwriting.

Such performances certainly do not tend to give the public or the courts any great confidence in the value of this kind of testimony, so it is fortunate that in late years the application of scientific methods and instruments to the accurate identification of bullets and cartridge cases has reached such a state of development that it frequently is possible, by the aid of the microscope and of enlarged photographs, to show *exactly* what happened, without the slightest chance for a difference of opinion. In one such case, the State's attorney, (who by the way, is now the Attorney General of the United States), himself recommended a nolle prosequi of the case after he had seen from a comparison of the murder bullet with one from the defendant's gun, that they did not match. For further details of this case, see page 299. This substitution of clearly demonstrable fact for mere opinion has greatly strengthened the value of expert testimony in firearms cases, and has created a marked change in the status and prestige of the expert in this line.

This subject is ordinarily thought of primarily in connection with criminal cases, but in late years particularly, there have

been more and more instances of civil suits for personal damages arising from some incident or accident connected with the use of firearms. Suits of this kind are increasing in number, and offer a fertile field for the services of the expert. They may involve some failure of material, such as the bursting of a gun, which is very often the fault of the user, but which is likely to result in a suit against either the maker of the gun, or of the cartridge, or of both; or from the accidental or intentional wounding of one person by another, in which case the user of the gun may very properly find himself the defendant in a damage suit, even though he is relieved from criminal responsibility. In still another class of cases the proprietor of a shooting gallery may be sued for some injury to one of his patrons, or a gun club or shooting organization may be sued for an injury sustained by a range attendant or some other person on the range; or possibly to some person who may not even be on the range, as in cases which have happened in the past where a bullet has for some reason been allowed to go wild and strike a dwelling or individual in the neighborhood.

- ✓ Firearms and explosives act in their own peculiar and characteristic way, which may seem simple enough to those who are familiar with such things, but in regard to which the public in general, including many of the police, are almost completely uninformed. For this reason, individuals who have had even a moderate experience with firearms and explosives frequently have sufficient special knowledge of this kind to enable them to give a final answer to questions on which the authorities may be totally in the dark. An example of this is the case of an individual who was mysteriously shot with a .380 automatic pistol bullet.

A man who happened to be in the vicinity of the shooting was arrested because he was found to possess a .380 caliber Colt automatic pistol which had recently been fired. Things looked very serious for him until one of his friends who was interested in firearms heard of the case and began to investigate it. On examining the bullet taken from the body of the victim, this friend observed that there were seven rifling grooves on the bullet, and he happened to know enough about firearms to realize all Colt automatic pistols have six grooves and that the only .380 automatic pistol made in this country with seven grooves is the Remington. When this fact was pointed out to the authorities they

released the prisoner and began looking for the owner of a Remington pistol, with the result that the real murderer was soon apprehended.

There is little doubt that the first prisoner would have been convicted of a crime of which he was entirely innocent if he had not been fortunate enough to have had a friend who took more than the usual interest in guns.

In another case a bullet recovered from the victim was a .45 caliber metal jacketed bullet, the type used in the government model automatic pistol. It did not take long for the police to find a suspect who had a .45 caliber automatic pistol in his possession and it probably would have gone hard with him if it had not been for the fact that a firearms expert was available who pointed out that the Colt automatic pistol has rifling with a left-hand twist, whereas the bullet in question showed right-hand rifling marks. The expert advised the authorities that the shooting was done with a Smith & Wesson Model 1917 revolver which shoots the same cartridge as the automatic pistol but which has a right-hand twist.

These examples, which might be multiplied by the hundred, illustrate the very great service to the cause of justice that can be rendered by even a moderate knowledge of firearms. The information rendered in these cases did not require any deep or abstruse knowledge or any special apparatus. It required only the ordinary knowledge that any alert user of firearms might possess.

[There are, however, many problems occurring in connection with criminal cases in which the answer, while apparently very difficult to obtain, is really quite simple provided there is available one of the several scientists who now make firearms identification their specialty. These men have records available of the specifications and characteristics of practically every firearm that has ever been made and they also have elaborate and delicate instruments constructed especially for firearms identification. Moreover, they also have years of experience and study on this subject.]

Without this experience as well as access to the records and instruments referred to above, no man is fully equipped to qualify as a firearms identification expert. Unfortunately, it is only in recent years that such experts have been available, and a few years ago almost anybody with a slight smattering of small arms knowledge and a plausible manner could get up before a jury as an expert witness and either swear away the life of the accused or else throw a monkey wrench in the wheels of justice at fifty

dollars a day and expenses. Fortunately the individual whose main equipment is a pocket magnifier and a footrule plus unlimited gall, is finding it increasingly harder to be permitted to qualify as an expert on this subject.

A case of this kind is described as follows by R. E. Herrick in *Arms and the Man* for May 15, 1923:

"The accused secured the best legal talent that could be found, and the prosecuting attorney bestirred himself to make his case as nearly impregnable as he could humanly hope to do.

"To bolster his case Mr. Prosecuting Attorney employed the services of an expert (self-styled) on firearms and ammunition. This man is the operative of a large, well-known detective agency.

"It was brought out in the cross-examination of this expert that he had secured a certain bullet found on the floor of the cellar, and another one from the inside lining of the coat worn by the deceased at the time of the killing. He had secured the revolver belonging to the accused and had recovered several bullets fired from this gun and by means of a magnifying glass and a so-called 'micrometer' had determined that the bullet found in the deceased man's coat had been fired from the gun admittedly belonging to the accused.

"One of his tests had been to cut off the jacket of the bullet to note the effect of the lands of the barrel on the soft lead beneath. Just what he expected to find there I cannot imagine. Perhaps he expected to find some sort of magic photograph showing the image of the fifty dollars per day he was getting for his 'expert' testimony. I suspect it was merely hocus pocus.

"His magnifying glass used for comparing indentations on the recovered bullets, was, as I remember, either a single or double lens pocket magnifier. His micrometer caliper was nothing more or less than a Starrett inside and outside caliper rule, graduated down to 1/64". And on the readings of such instruments as these, this 'expert' on firearms and ammunition was willing to swear a man's life away at the rate of fifty dollars per day.

"I would like to hear the roar that would go up if the Ordnance Department sent out National Match Springfields accompanied by star gage records reading something like this: 19.5/64", 19/64", 19/64", and so on."

In this case Mr. Herrick, who was president of the Boise Rifle Club, was called by the defense and I will quote further from his article as follows:

"One amusing incident occurred during cross-examination of the 'expert' by the defense. The witness was asked to show the jury the instrument used to measure these bullets. The witness passed over said caliper. The questioner took it, examined it a moment, held it up and exclaimed, 'Why this is not a micrometer, this is a monkey wrench,' much to the amusement of the spectators.

"Major Hatcher would do well to get this 'expert' on his staff at Frankford Arsenal, for see how complete is his knowledge of the manufacture of firearms:

"Question by defense attorney: 'Mr. G., have you ever spent any time in a factory where revolvers are made?'

"Answer: 'Yes, sir. I have been through Browning Bros. Plant.'

"Question. 'Explain to the jury how revolver barrels are made.'

"Answer: 'They are cast in moulds.'

"Shades of Samuel Colt and of Eliphalet Remington! Such 'expert' testimony in a trial wherein twelve good men and true are to decide whether a fellow man is not guilty of the crime of murder. If that sort of testimony is worth fifty dollars per day then a hodcarrier who knows his business should receive remuneration at a rate of not less than \$5,000 per day."

This case is merely one of a number of similar or even more flagrant ones that have come to my attention. In one case in New England a man was actually convicted and sentenced to death but afterward given a new trial and acquitted when a member of a revolver club became interested in the case and developed the fact that in spite of magnifying glass and micrometer, the "expert" in this case had failed to notice that the bullet had six grooves whereas the defendant's gun had only five.

The Famous Stielow Case

The present science of firearms identification as it exists in this country may be said to have its origin in the notoriety aroused by a gross miscarriage of justice in New York State. One C. E. Waite, formerly an operative in the Department of Justice, became interested in this case and started work along this line which since his death has been ably carried on by Colonel Calvin Goddard and others.

At daybreak on March 22, 1915, Charlie Stielow, an illiterate, good-natured tenant farmer, on going out of his house discovered a woman in her nightdress lying dead on his doorstep, shot through

the heart. Her footsteps in the light fall of snow led from the nearby house of Charles B. Phelps, the owner of the farm.

The dead woman was housekeeper for the aged Phelps who was reputed to keep large sums of money in the house. Stielow found the kitchen door of the Phelps house open, a bullet hole in the glass and his employer, a man of seventy, unconscious on the kitchen floor with three bullet wounds in his body. A lighted lamp was burning low on a nearby table. Stielow at once ran to a neighbor's house and gave the alarm. It was quite evident that robbery was the motive, as the bureau where Mr. Phelps kept his money was rifled and his wallet was missing.

The murder was committed in a small rural community, and the local authorities, unused to coping with such crimes as homicide had allowed the curious crowd to trample the foot prints and destroy most of the clues before any real constructive work was done toward solving the mystery.

Stielow lived in the tenant house with his wife and two children, his wife's mother and his wife's brother, Nelson Green. The shooting had been done with a .22 caliber firearm and both Stielow and Green swore at the inquest that neither had a gun of any kind, but it turned out later that Stielow owned a cheap .22 caliber revolver and a .22 caliber rifle and that he had given these guns to a younger brother-in-law to hide.

After ten days had elapsed without any progress Nelson Green was arrested and at two o'clock the next morning detectives secured his signature to his confession that Stielow and he had committed the murders. Stielow was thereupon arrested and held in jail separately from Green. He made a request to be allowed to talk to his wife as he said he had a heavy burden on his soul. He was, therefore, accused of the crime and as is not unusual in such cases, he also finally confessed.

The two confessions checked generally, though neither told anything that was not common knowledge to everybody who had been in the vicinity, except that each man accused the other of instigating the crime and firing the fatal shots. The confessions stated that they had planned to rob Phelps and had waited outside until he was in bed, then rapped on the kitchen door and shot him down when he answered the knock. As they went toward the bedroom where they expected to find the money, the housekeeper ran out of her room through the kitchen and out of the door, closing it behind her. The two men ran after her, shot her through the

glass, ran to the bedroom, made a search until they found the money, and leaving the house heard and saw the housekeeper pounding and clawing at the front door of the tenant house and screaming to be admitted. Ignoring her, they entered the rear door of the house, discussed the screams with the women folks, and then went to bed. They said they got about two hundred dollars and each man accused the other of having kept it.

At the trial the farmer repudiated this confession, and when questioned about the "heavy burden" he had spoken of, said it was the fact that he had lied about not having any guns. An expert for the prosecution testified that under the microscope he had found nine abnormal defects in the flare of the muzzle of Stielow's gun, and found nine corresponding peculiar scratches on the four bullets taken from the bodies. The scratches were not visible to the naked eye, he said, and were first detected under the lens, and he gave it as his opinion that all the bullets were fired from Stielow's gun and could have been fired from no other.

On cross-examination it was brought out that the enlarged photograph of the bullets showed to the jury by the "expert" did not reproduce the nine marks; it was, for some unknown reason, a photograph of the opposite side of the bullet.

Asked why the uneven ridges at the very extremity of the barrel should mark the bullet, the "expert" replied: "The cylinder fitted so tightly against the rear of the barrel that there was no leakage of gas at the breech. The full force of the gas following the bullet out at the muzzle, the lead expands as it leaves the muzzle, fills in any depressions existing at the outer edge of the bore and receives scratches from the elevations existing between said depressions."

On the basis of the "expert" testimony that the bullets had been fired from Stielow's revolver and could have been fired from no other, the jury found Stielow guilty of murder in the first degree and sentenced him to die in the electric chair some time during the week of September 5, 1915. Green was told that Stielow had been sentenced to death and that if he would confess he might get off with twenty years. Accordingly he plead guilty and was sent to Auburn Penitentiary.

But Stielow did not go to the electric chair. His lawyer was convinced of his innocence and began a series of appeals, and a Humanitarian Cult of New York City began taking an interest in the case. Members of this Cult soon found some slight evidence

that two tramps and horse traders who had been in the vicinity of the house might know something of the murders.

While this investigation was going on, the case had been reviewed by the Court of Appeals and a motion for a new trial was denied in February 1916. In June of that year a second application for a new trial, and in July a third, were denied, and in October a fourth appeal met the same fate. All the judges found that Stielow had been fairly tried and justly convicted.

In the meantime the Humanitarian Cult had been strengthening the evidence against the two horse peddlers and finally on December 4, 1916, the Governor, unsatisfied of Stielow's guilt, commuted his sentence to life imprisonment.

During this time the ignorant farmer had been adjudged guilty by a jury and by ten judges who had subsequently passed on his case in connection with the numerous appeals. Finally the Governor had one of the two suspected horse traders brought before him and his answers were so evasive and unsatisfactory that the Governor appointed a prominent Syracuse lawyer, Mr. George H. Bond, to conduct a special investigation into the case of the murder of Phelps and his housekeeper, Miss Wolcott. Mr. Bond drafted Mr. Waite from the Attorney General's office to aid him.

Under searching analysis, the confessions of Green and Stielow, once considered solid evidence, appeared in a new light. Such glaring inconsistencies were discovered as to make it almost self-evident that the men who made the confessions could not have had first hand knowledge of the crime.

After shooting down Phelps, as told in the confession, Stielow was supposed to have picked up the lamp and advanced from the kitchen through the dining room and a small hall, and was just about to enter the old man's room to search it, when Miss Wolcott ran out of her room, through the dining room toward the kitchen door. By the time they reached the kitchen she was outside and the door was closed behind her. They shot her through the glass door and heard a scream. If the confession is to be credited, the two men fired at the fleeing woman, and did not even bother to see whether or not she was hit, but let her run screaming into the night to arouse the neighborhood, while they returned to ransack the premises and make a careful search for the money.

Miss Wolcott, when she ran through the kitchen passed close to Stielow who was carrying a lighted lamp and wore no disguise. His mere bulk would have identified him, and it is incredible that