

Editor's Note:

Thank you to Lieutenant Kline for his presentation and sharing two of the St. Valentine's Day Massacre guns with our group.



DR. CALVIN GODDARD

CSI: ST. VALENTINE'S DAY MASSACRE



Presented by:





Figure 1.

The St. Valentine's Day Massacre exceeded any gangland killings before or after February 14, 1929, throwing the city into a frenzy of police activity, awakening the Chicago Crime Commission, and dismayed civic-minded businessmen who were tired of hearing their city called the world's "gangster capital." Coroner Herman Bundesen (Figure 1), wielding more authority than any medical examiner before or since, virtually took charge of the case and immediately selected a "blue-ribbon commission" of leading citizens who became part of a special grand jury that would attend a year's worth of hearings.

The hearings accomplished as little as the police investigations, except in one respect. Bert Massey, vice-president of the Colgate-Palmolive-Peet Company, had heard of a New York "criminalist" named Calvin Goddard who had tried to introduce the new science of forensic ballistics into the court case of Nicola Sacco and Bartolomeo Vanzetti, the self-described anarchists accused of a 1920 payroll robbery in South Braintree, Massachusetts, killing a paymaster and a guard in the process. Microscopically examining the smallest striations on the death bullets and bullets fired from the guns of both defendants, he established that the Colt .32 automatic found on Sacco at the time of his arrest, but not Vanzetti's .38 Harrington & Richardson revolver, had fired the fatal shots. Such "ballistics" evidence was too arcane for the court, and the jurors ignored it in favor of their prejudices against "anarchists," then poised to destroy America. In 1927 both Sacco and Vanzetti were executed.

Two years after that the City of Chicago was too preoccupied with closing speakeasies and arresting "the usual suspects" to give much thought to science, or spending city funds on it; but Massey had been sufficiently impressed by

Goddard's work that he enlisted support from Walter Olson, president of the Olson Rug Company, and they used their own funds to hire Goddard's services. He immediately left his private laboratory in New York in the hands of two colleagues* and began setting up an even more elaborate lab in Chicago to work on the Massacre. At Coroner Bundesen's suggestion—because the police themselves were still suspects—a Scientific Crime Detection Laboratory was soon established under the auspices of the Northwestern University Law School, between Chicago's famous "Water Tower" (a souvenir of the Great Chicago Fire) and the Lakefront.

Goddard's was a full-service laboratory, patterned partly after a lab set up five years earlier by August Vollmer in California, and partly after laboratories long-established in several European countries. The Europeans were far ahead of the United States in most areas of forensic science; where they came up short was in ballistics.

Their specialists (and Vollmer's as well) had a basic understanding of the rifling marks on bullets, but for evaluation they still were wrapping slugs in tinfoil and trying to match them by studying the patterns with a magnifying glass. Goddard employed a new split-image comparison microscope (Figure 2) developed by Philip Gravelle, which actually was a pair of microscopes linked to a single eye piece and had two independently rotating posts instead of a mirror-and-plate arrangement that would normally hold a slide.

Bullets mounted with wax on each post could be slowly turned until the nearly-invisible striations perfectly matched up. Or failed to match up, the bullets came from different guns.

Goddard also used a "helixometer" (Figure 3), newly developed by John Fischer based on the medical cytoscope, which could optically examine the interior of a gun barrel for residue, confirm its caliber, and determine the pitch of the rifling. Rifling differed among manufacturers and usually was unique to a particular brand, model and caliber. Similarly, each gun left marks on the primers and casings of their empty shells that were also unique to a single weapon.

Using slugs taken from the Massacre victims including 70 fired bullets of .45 automatic pistol caliber, many of them whole, the rest more or less fragmented, and seventy shell casings picked up off the floor, Goddard first spent many hours explaining the theory and practice of forensic comparison.

Then he established to the satisfaction of the coroner's jury that two .45-caliber Thompson submachine guns had been used. At the time there were five relatively common weapons chambered for this cartridge. They were the Colt

.45 automatic pistol, the Savage experimental .45 automatic, the Colt and Smith & Wesson M1917 .45 revolvers, and the Thompson submachine gun.

Each of these arms had its own individual rifling characteristics, except that the Colt M1911 pistols and M1917 revolvers were supposed to be rifled according to the same

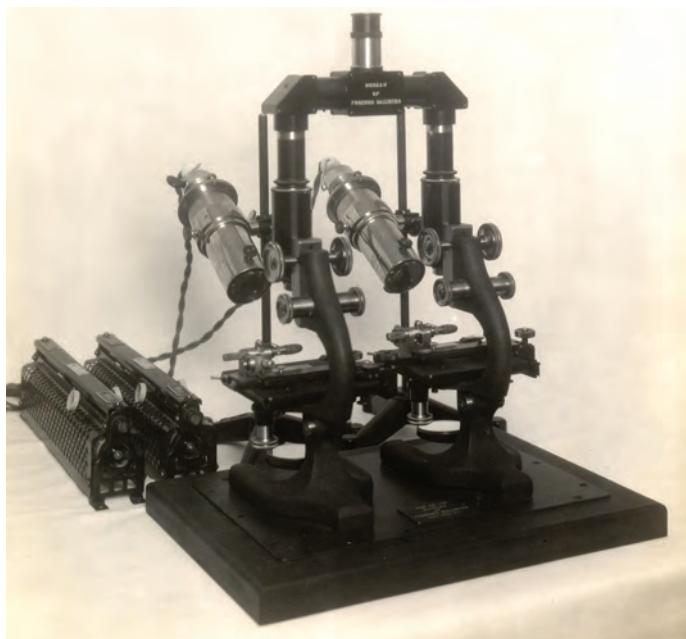


Figure 2. The comparison microscope used to compare bullet markings left by rifling.

specifications. However Colt revolver .45 bullets differ from Colt automatic .45 bullets. Also the Colt guns are rifled with a left twist, while all the fired bullets showed marks with a right hand inclination. This eliminated all Colt handguns.

While the other three guns all had six groove rifling, right twist, the shape of the grooves, pitch and width differed. The Savage automatic, being practically a unique gun, was hardly considered. The S&W revolver was also struck out, as the bullets did not show the tell-tale marks which indicate "fired from a revolver." Thus all that was left

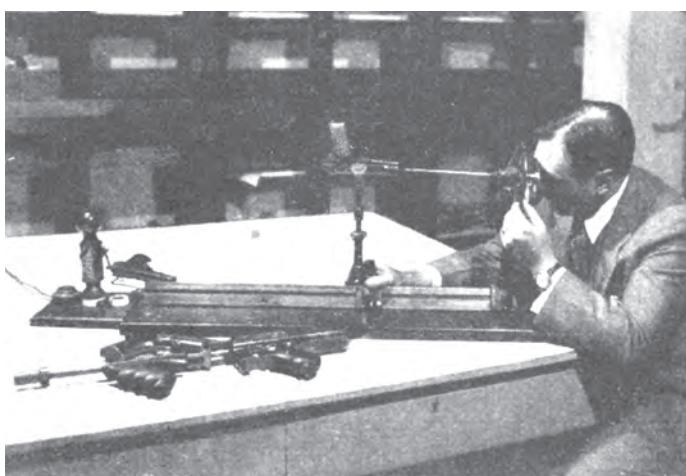


Figure 3. Dr. Goddard with the "Helixometer" for looking down gun barrels.

was the submachine gun. Confirmed by the arc shaped print on the case rim, left by the Thompson gun bolt as it slams forward chambering the cartridge, two of the guns were believed to have been used. Magazines for this firearm came in 50 rounds and 20 round capacities. Fifty of the shells showed identical case marks, while the other 20 showed different patterns of marks. Obviously guns using these two kinds of magazine had been employed.

Since two of the Massacre killers had worn police uniforms, Goddard obtained and test-fired all the Thompsons belonging to the police departments in Chicago and its suburbs. These were ruled out.

The following December, while lying low as "Frederick Dane" near the lakeside town of St. Joseph, Michigan, Fred 'Killer' Burke (Figure 4) panicked following a minor traffic accident and killed a policeman named Charles Skelly. He escaped, but the Berrien County, Michigan, Sheriff's Department raided his house near St. Joseph, Michigan, and found an arsenal of ordnance that included two Thompson guns. These were delivered to Goddard's laboratory for examination. They turned out to be the weapons used in the Massacre, and the man who possessed them, Frederick Dane, who turned out to be Fred "Killer" Burke, had beat it out of town.

The New York police were aware of Goddard's new crime lab (Figure 5) and sent bullets taken from the body of local gangster Frankie Yale (Shot July 1, 1928), which were found to have come from one of the Massacre guns. (A second machine gun used on Yale had been left in the car abandoned in Brooklyn by the killers.)

Besides advancing the science of forensic ballistics, coupled with shooting angles and distances, Goddard's laboratory soon was doing hair and fiber investigations, discovering new chemistries for use in serology (blood), and



Figure 4.



Figure 5.

employing the new "moulage" technique to make rubber-and-plaster casts of footprints and tire tracks. The lab even utilized Leonarde Keeler's new "lie-detector" equipment, which could help police narrow their list of suspects (but which is still not admissible as courtroom evidence).

Additionally, in 1931, the Scientific Crime Detection Laboratory set up month-long classes to train future criminalists, one of whom turned out to be a "G-man," Special Agent Charles Appel, who took his knowledge back to Washington, D.C., to help set up a national crime laboratory using the same equipment and technologies some eighteen months later. When FBI Director Hoover chewed out Melvin Purvis for doing business with the Chicago lab, and also refused to give the lab any credit, Goddard was dismayed.

After the early financing by Massey and Olson, Northwestern University funded the work of the laboratory, which was partly offset by charging for services performed. Even that was not enough to make the laboratory self-supporting, and during Chicago's world fair of 1933 the lab had to set up an exhibit and sell souvenirs, such as a matchbox-size container with a bullet and shell casing. The inscription read:

THIS BOX contains a .45 caliber metal-jacketed Bullet
and a .45 caliber Shell both fired from a Machine Gun taken
from Chicago Gangsters.

In the early 1930s the laboratory outgrew its quarters and was moved from 469 Ohio Street to a nearby Northwestern building at 222 East Superior. Calvin Goddard went back to New York, leaving the lab in the hands of Fred E. Inbau and a well-trained civilian staff. By 1938 the Chicago police had lost its gangster-era stigma, purchased the facility for \$25,000, including two chemical laboratories, a photography room and darkroom, its comparison microscopes and related equipment, a chamber outfitted with a "lie detector," a document examiner's room, a library that included some 1000 books

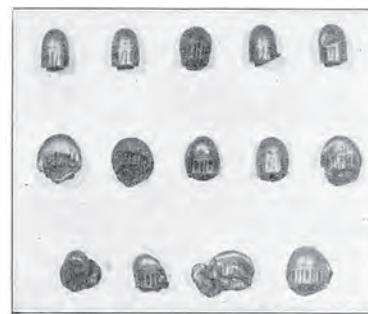
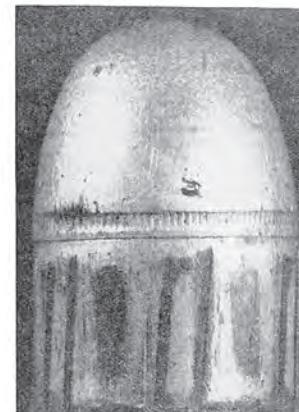


Plate 16. Fourteen fired bullets found on floor of garage.



* Plate 17. .45 automatic pistol bullet of U. S. Cartridge Company make with cannelure, fired through Thompson gun.



Plate 18. .45 automatic pistol bullet of U. S. Cartridge Company make without cannelure, fired through Thompson gun.



Plate 19. .45 automatic pistol bullet fired through Savage automatic pistol.



Plate 20. .45 automatic pistol bullet fired through .45 Smith and Wesson revolver.

Figure 6. Comparison of different .45 caliber slugs, fired from popular firearms of the day.

on scientific crime detection, and an exhibits room containing many hundreds of guns and other implements of crime (Figure 6).

Most of the civilian staff was employed to operate the police department's lab, to be located in the police headquarters building at 1121 South State Street, and when the department expressed a desire to replace these men with police personnel, Inbau began training officers who had at least some background in science.

One of the original crime lab's major and lasting contributions was its American Journal of Police Science, first published in January-February, 1930, by the Northwestern University Press, and which has since been incorporated into the Journal of Criminal Law and Criminology, published

originally in 1910 by Northwestern as an academic periodical and still widely circulated today.

THE ST. VALENTINE'S DAY MASSACRE

The Massacre remains officially unsolved, but the standard account has it engineered by Capone's right-hand man,

"Machine Gun" Jack McGurn, who supposedly tricked the Moran gang into assembling at 2122 North Clark Street, their Near North Side booze depot, to take delivery of a load of Old Log Cabin whiskey hijacked from Capone. This turns out to have been speculation based on the remarks of a federal Prohibition official who had learned of a recent hijacking. (The victims, except for a mechanic and the optometrist, were gang royalty, dressed in their best; and Moran later dismissed the hijacked-liquor story, saying he'd called the meeting to deal with a recent assassination attempt and the possibility of there being a Capone mob informant.) The same Prohibition official also thought the killers might well be crooked Chicago cops on a personal mission—an accusation he later denied making, but which still caused his banishment to another city and eventual resignation.

In any case, about 10:30 a.m. on February 14, 1929, the Moran lieutenants were drinking coffee in their unheated garage (innocuously identified as the S.M.C. Cartage Co.) (Figure 8) when they were interrupted by two men in police uniforms. Annoyed but not particularly worried at what they assumed would be a routine shake-down, they surrendered their weapons and were ordered to line up facing the north wall, about the only place not cluttered with cars and trucks used in their particular line of "cartage." Before a payoff could be discussed, two or three more men in expensive overcoats entered the garage and the Moran group was raked with seventy bullets from two Thompsons, plus a couple of shotgun blasts. The killers then handed their now-empty guns to the men in uniform who marched them, as if arrested, back outside to a phony police car and sped off.

Bugs Moran, the intended target, survived only because he arrived a few minutes late, saw the bogus police car, and retreated. (Two other North Siders were also running late, and it now appears that one of them, or another gang member, had secretly defected to the Capone Outfit.)



Figure 7.

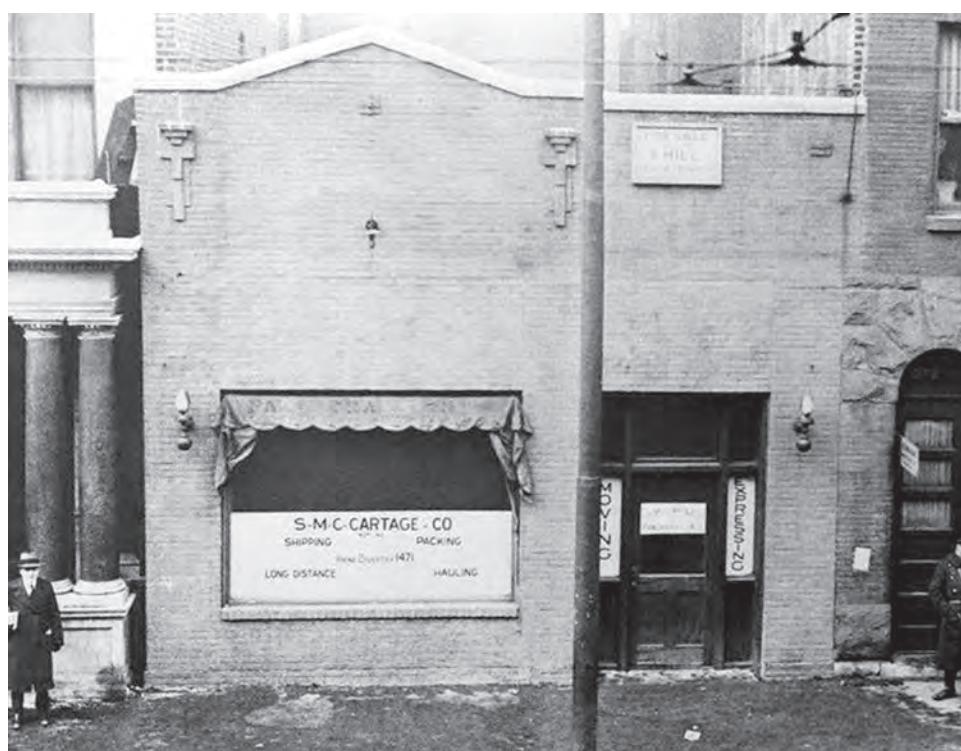


Figure 8.

A woman neighbor heard what sounded like gunfire and the howling of a dog, and asked her roomer to investigate. In the back of the garage, still reeking with gun smoke, he found six dead men and one who would die a short time later.

This much was reported by the newspapers, and the mass murder horrified Chicago as well as the rest of the country. Police later arrested McGurn in a room at the luxurious Stevens Hotel on Michigan Avenue (now the Hilton Towers), but his girlfriend, Louise Rolfe, whom he later married, would always stick to her story that Jack had been with her in bed all morning, presumably making St. Valentine's Day love. He used his interest in the Guyon Hotel at 3000 West Washington to post bond and ultimately was set free for lack of evidence.

In the months following the Massacre, a coroner's jury of prominent Chicagoans met many times without developing enough evidence to prosecute anyone, though police work established that the killers had headquartered at Maddox's Circus Café, 1857 West North Avenue, while awaiting the word from lookouts in rented rooms across from the S.M.C. Cartage Co. garage. Further evidence that the killers were not the "usual suspects" came from a woman in nearby Lincoln Park whose horseback-riding companion had noticed them earlier and described them as "West Side gangsters" as opposed to Moran's North Siders.

A major blunder on the part of Fred Burke later confirmed his involvement in the Massacre. The following December, while lying low as "Frederick Dane" near the

lakeside town of St. Joseph, Michigan, Burke panicked following a minor traffic accident and killed a policeman named Charles Skelly. He escaped, but sheriff's officers ransacking his lavishly furnished house uncovered a cache of weapons that included two Thompson submachine guns. These were sent to Chicago for ballistic testing by firearms-identification expert Calvin Goddard.

For reasons still unclear, Michigan authorities refused to send Burke to Illinois even for questioning, and he eventually died in the Michigan state prison while serving life for the murder of Officer Skelly.

In January 1935, several members of the Barker-Karpis gang were captured in an FBI raid (Figure 9) on a Chicago apartment building at 3920 North Pine Grove Avenue. One was Byron Bolton, charged with kidnapping. While in federal custody he (possibly through a lawyer, and probably because he thought the mob had tipped off the FBI to their hideout) gave a considerably different version of the Massacre to the Chicago American. He revealed that he, not the Keywell brothers from the Detroit Purple Gang, had been one of the Clark Street lookouts; and that some of the planning had taken place at a Capone hideaway in Wisconsin operated by Fred Goetz, with two state legislators present. He had been the errand boy who not only catered the meeting but also purchased one of the two cars used by the principal gunmen. These were not the suspects named by the police and reported by the press, but rather the "American boys," including Fred Burke, imported mainly from St. Louis

to serve as Capone's "special-assignment" squad. Bolton remembered the phony name he had used to buy one of the cars some five years earlier. Though he had left his post to use a phone when he thought he recognized Moran, he guessed the killers to be Burke, Gus Winkeler, Fred Goetz, Murray Humphreys and Claude Maddox. However, the newspaper's anonymous source had obtained the details second- or even third-hand and may have confused Bolton's plotters with the actual shooters. Bolton stupidly had left behind a bottle of prescription medicine and a letter addressed to him from his downstate family, which gave the police an unfamiliar name they all but ignored at the time. The newspaper devoted its front page to this scoop, but since Bolton had not shared any Massacre information with his FBI captors, J. Edgar Hoover immediately



Figure 9.

declared it false in all respects, and the other papers took Hoover at his word.

Though scotched by Hoover at the time, Bolton's "confession" in the Chicago American was largely confirmed a short time later by a most unlikely source. After reading the paper, the widow of Gus Winkeler (an "American boy" who had stayed with Capone, only to be murdered in 1933 by the mob's Frank Nitti faction) told what she knew to the FBI. And although Hoover had dismissed Bolton's American story, his men immediately were ordered to squeeze Bolton for old Massacre details, which secretly went into an FBI file.

With minor differences, Georgette Winkeler supported Bolton's story and added new perpetrators, including her deceased husband (whom the papers called James Ray at the time) and the names of two other St. Louis gunman, Raymond Nugent and Robert Carey (in place of Humphreys or Maddox). She said Fred Goetz was the man who had brought the police uniforms to her and Gus's home, and had amused himself by wearing one to frighten visiting mobsters.

The standard and widely-accepted story describes one bogus detective car arriving at the S.M.C. Cartage Co., but an elderly woman in the building next door was looking out her bay window, had seen two detective-type cars (one of which stopped), and wondered what was going on. Police likewise ignored the claim of a neighborhood youngster who insisted that he had seen a second car in the alley behind the garage; and that two men dressed as police had first gone in the back double doors when they were opened for a truck. Sensing that some excitement would soon occur, he had then hurried around to the front, probably about the time of the shooting, and there witnessed the scene described by others: Two armed men in uniform marching other men in civilian clothes to the Clark Street detective car, which then sped away. This suggests that the phony cops slipped in through the back, disarmed the occupants with their revolvers, and then let the plainclothes machine-gunners in through the front. The Chicago police did not dispute newspapers' simpler one-car story, although an officer who stayed on the case as a hobby later calculated that as many as eleven to fourteen men participated in the Massacre, some remaining in the getaway cars, others leaving through both front and rear doors, as well as several lookouts who would have been parked up and down Clark Street to block any pursuit by real police. Two of these probably were Tony Capezio, part owner of the Circus Café, and Rocco DeGrazia, at whose apartment some of the gunmen were staying at the time. According to Georgette Winkeler, DeGrazia was part of the Massacre crew, probably as a lookout; and a name added to the group in more recent times was that of Tony Accardo, then a rookie who drove for Jack McGurn but who would one day boss all organized crime in Chicago.

Many of these random facts went unnoticed or unreported, but some came together on February 21 when a car fitted out to resemble a detective Cadillac exploded in an alley garage on Wood Street, about a block from Maddox's Circus Cafe and maybe a ten-minute drive from Clark Street. Arriving firemen found a siren, a police gong and a Luger pistol in the wreckage, and police decided that the garage had been rented by Maddox himself, using a phony name and an address next door to his Circus Cafe (which had suddenly gone out of business). Both buildings were vacant, but the one next to the cafe obviously had served as a meeting place for Maddox's Circus Gang, which included his St. Louis friends and amounted to a Capone beachhead on Chicago's Near North Side.

Someone had seen a burned man run from the garage toward a nearby hospital, but he left minutes later without waiting for treatment and possible questioning by police. That minor mystery was cleared up some forty years later when outlaw Alvin Karpis published his biography. The burn victim was "Tough Tony" Capezio, ally of Capone and a friend of Karpis (whose family lived in Chicago), who had been tediously dismantling a 1927 Cadillac. He evidently was unaware that the fuel system included a canister of gasoline attached to the firewall to gravity feed the carburetor, and had gotten into it with a cutting torch.

The blast ended that project, and the leads it provided were not diligently pursued. On February 27, the second murder car, a 1926 Peerless, was blasted with dynamite in the suburb of Maywood, where firemen found another police gong and gun rack, as well as a pocket notebook belonging to Albert Weinshank, one of the Massacre victims. Maddox lived in Maywood, but nothing came of that lead, either, possibly because the town was a stronghold of Capone.

The role of Capone is perhaps the greatest mystery—whether he personally ordered the Massacre out of a murderous megalomania (as popular history would have it); ordered the killing of Moran, partly in self-defense (a short time earlier his men had tried to shoot Moran near a night-club, but missed); or if he truly was exasperated with the continuing gangland violence (as he always claimed) and had left the matter to Frank Nitti, who delegated it to Willie Heeney, who put Fred Goetz in charge of the "American boys," expecting them to use good judgment. Those are some of the possibilities, for there were several other factors involved.

The North Siders recently had teamed up with gangster Joe Aiello in his war with Capone for control of the Unione Siciliana. Originally an immigrants' benevolent society, the Unione had turned small-scale distilling into a major cottage industry in "Little Sicily," which bordered Moran's

territory on Chicago's Near North Side. Meanwhile, Moran had discovered the enormous profit potential in both racketeering and gambling, which pitted him against Capone allies (including the "American boys") who were invading his own North Side. Moran's unruly gang had never ceased sniping at Capone since the murder of Dean O'Banion in his flower shop in 1924; and Capone had lately deeded North Side gambling operations to Gus Winkeler and his friends, if they could muscle Moran out of the picture.

According to one police scenario, the threat of killing was all that was ordered. But when Pete Gusenberg realized the cops were phonies he went for a gun in a nearby desk drawer, and the shooters opened up with their Thompsons. A more plausible theory is that the gunmen did not anticipate the crowd they had lined up, or could not get anyone to admit he was Moran, and didn't know what to do except kill them all. One can only imagine Capone in Miami getting the phone call from Chicago and thinking to himself, If you want anything done right, you got to do it yourself.

The St. Valentine's Day Massacre was a public-relations disaster that cost the Chicago Syndicate millions of dollars following the police department's crackdown on speakeasies (which numbered 8000 to 10,000) and countless gambling joints, ranging from handbooks to betting parlors to casino-size

clubs. It caused economic turmoil in the business community that had thrived on out-of-town visitors, and left the city with a scar as conspicuous as those on Capone's left cheek. It also blackened the name of Capone, who had rather enjoyed his improving image as the Babe Ruth of American gangsters. And it inspired two wealthy businessmen to fund the establishment of the country's first full-service crime lab, to be operated by Northwestern University's Law School because Chicago's police were so notoriously corrupt.

*With his North Side mob in shambles, Moran's criminal career spiraled downwards. After hiding out for many months, he ventured back to the Chicago area and tried to place slot machines in the northern suburbs. At the time of the Massacre he had suspected a traitor in his ranks, and it might have been Ted Newberry, who soon was welcomed by the Capone mob. That Moran eventually learned the identity of the shooters (or some of them) is suggested by his conversation in 1932 with an old friend and former booze-truck driver he happened to encounter in a suburban bar. He off-handedly remarked that he had just returned from the coast, where he had "taken care of" a Bob Carey. Neither the now-elderly trucker nor his recent interviewer, Rose Keefe, knew that name, but Carey, according to Georgette Winkeler, was one of the Valentine's Day shooters.

Adapted from The St. Valentine's Day Massacre, based largely on the unpublished manuscript of Georgette Winkeler (spelled Winkler in the press), FBI documents, news stories at the time, three newspaper features in later years, and an Alvin Karpis footnote in John Kobler's Capone.

Thompsons of the St. Valentine's Day Massacre



Thompson Submachine Gun, Model Of 1921A - Serial Number 2347, caliber .45ACP.

HISTORY OF SERIAL NUMBER 2347

Manufactured by the Colt's Patent Firearms Co. and delivered to Auto-Ordnance between July 18-23, 1921. The firearm was then sold to Deputy Sheriff Les Farmer of Marion, Ill on November 12, 1924. Farmer became a member of the Egan's Rats gang and the gun was eventually in the possession of Fred "Killer" Burke.

The gun was later seized from the safe house for Fred "Killer" Burke by the Berrien County Sheriff's Department,

Michigan on December of 1929. The Thompson was turned over to Dr. Goddard and forensically proven to have been used in the St. Valentine's Day Massacre. The serial number was never removed from this Thompson.

The New York Police also sent Dr. Goddard bullets from the murder of Frankie Yale. The Yale murder was the first time a Thompson was used in a crime in New York. The New York bullets also were from this Thompson.

Dr. Goddard and the Corner's Jury are shown with this gun in the photographs used in this exhibit. The Thompson



Thompson Submachine Gun, Model of 1921A, Serial Number 2347.



Thompson Submachine Gun, Model Of 1921AC - Serial Number 7580, caliber .45ACP.



is now in the custody of the Berrien County Sheriff's Department.

HISTORY OF SERIAL NUMBER 7580

Manufactured by the Colt's Patent Firearms Co. and delivered to Auto-Ordnance between January 30-31, 1922, as a Model of 1921A. This Thompson was modified by Colt's for Auto-Ordnance to have a Cutts Compensator added to the barrel, making a Model of 1921AC.

The firearm was then sold to a Chicago sporting goods store called Von Frantzius Sporting Goods and delivered on October, 19, 1928. The shipment was for three Thompsons and was shipped with three Type L (fifty round) drums.

Von Frantzius then sold the Thompson over the counter to a man identified

as Frank V. Thompson (no relation to Gen. John T. Thompson) who also paid Von Frantzius to use a gunsmith by the name of Valentine Guch to remove the factory serial numbers on the frame and receiver (cost for work \$2.00).

Von Frantzius then shipped a crate loaded with four bricks to an address for Victor Thompson in Elgin, Ill, and gave the guns to Frank Thompson on October 23, 1928.

Frank Thompson then sold the gun to a Bozo Shupe of Chicago. Shupe would not testify as to what happened to this firearm and was later found murdered on the near west side of Chicago. The firearm, along with the L drum had been given to the Gangsters which used it in the St. Valentine's Day Massacre, February 14, 1929.

The gun was later seized from the safe house for Fred "Killer" Burke by the Berrien County Sheriff's Department, Michigan on December of 1929. The Thompson was turned over to Dr. Goddard and forensically proven to have been used in the St. Valentine's Day Massacre. The serial number

was raised by acid by Dr. Goddard and the number restamped, which explains the finish on the firearm. Dr. Goddard and the Corner's Jury are shown with this gun in the photographs used in this exhibit. The Thompson is now in the custody of the Berrien County Sheriff's Department.

Comparisons of the Shell Casings from the St. Valentine's Day Thompsons

Serial Number 2347



Plate 15. Firing pin imprint with elevation at base of crater, left on shell fired in 2nd Thompson gun.

Serial Number 7580



Plate 14. Smooth concave firing pin imprint left in primer of shell fired in first Thompson gun.

Ejector Marks on Cartridges



Plate 12. Mark left on shell rim by ejector of first Thompson gun. Note parallel lines duplicating those present on ejector in Plate 11.

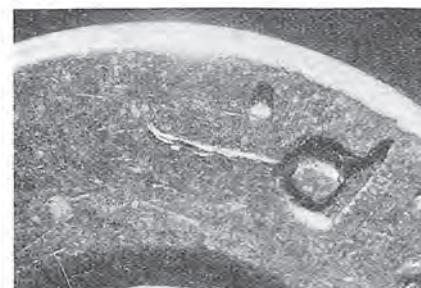


Plate 13. Ejector mark on rim of shell fired in second Thompson gun. Note marked difference between this and ejector mark shown in Plate 12.