



What Detail?

Special Agent Neal J. Morin
North Carolina State Bureau of Investigation Crime Laboratory
Firearm and Tool Mark Section



An unusual case was received in the Firearm and Tool Mark Section of the North Carolina State Bureau of Investigation Crime Laboratory in Raleigh, North Carolina that warranted documentation. The case involved a single fired bullet submitted for analysis. The submitting agency requested a list of possible firearms to assist them in their investigation. The following is a description of the circumstances surrounding the case and the fired bullet submitted for analysis.

The case involved an armed robbery where the victim was shot in the stomach at contact distance. The victim in this case was driving to visit his girlfriend late in the evening. The victim had car trouble and his car stopped about three blocks from his girlfriend's apartment. Unable to restart the car, the victim got out of the car with the intention of walking to his girlfriend's apartment. Almost immediately upon leaving his vehicle, the victim was accosted by three males. They demanded he give them his money. At this time, a fourth suspect comes forward, sticks a firearm in the victim's stomach and fires. The suspects take the victim's money and flee. The victim is able to get up and walk the three blocks to his girlfriend's apartment. EMS is called and the victim is taken to the hospital where the bullet is removed from his lower abdominal area. The victim is released a day later and goes to the local police station to give his statement. The victim describes the firearm as a shoulder fired weapon. The victim did not get a good look at the firearm, but he didn't believe the firearm had a short barrel (cut off or shortened). According to the hospital report, the bullet was removed from the victim after penetrating a short distance under the skin, approximately one inch. The local police department then submitted the fired bullet to the lab for analysis and a list of possible firearms.

Upon opening the evidence in this case, a small plastic bottle was found containing one (1) fired bullet*. The bullet had been cleaned at the hospital and was completely intact with almost no damage. The fired bullet was 308 caliber and weighed 150 grains. The fired bullet has a copper alloy jacket and a lead core. The nose of the bullet has a small portion of lead exposed and the jacket material at the nose has a scalloped design. The bullet was of the flat point design with a flat base. The bullet was most consistent with bullets loaded in Remington, 30-30 Winchester cartridges. The only damage to the bullet was at the lead tip on the nose, which was very slightly pushed back and deformed. What made this bullet so unusual was the fact that there were no rifling marks present. When viewed under the comparison microscope the bullet appeared as if it had been pulled from its cartridge case and never fired. The only mark found on the bullet was a very small flat spot at the base with some very fine striations, but no defined leading or trailing edges.

The fact that the victim appears to have been shot with a rifle cartridge at contact distance, received a non-fatal wound and having a rifle bullet with no marks present made this case something out of the ordinary. Knowing these facts, we started to put together possible firearm configurations and/or calibers that could recreate what had occurred.

Since the bullet had no marks, we surmised that the bullet would have had to be fired from a rifle of the wrong/larger caliber. (Example: Firing a 30-30 Winchester cartridge in a rifle chambered in 444 Marlin); fired in a firearm with a smooth bore; or fired in a firearm which the barrel had been cut off immediately in front of the chamber. Since the victim did not indicate that the barrel had been shortened, the last possibility was eliminated.

It was now time to test to see which type of firearm would best fit the facts we knew about this case. A test was done where two (2) Remington 30-30 Winchester cartridges were fired in a Marlin rifle chambered in 444 Marlin taken from the section reference library. (Diagram 1) In this test, marks were found on the bullets that were inconsistent with what was found on the evidence bullet. Each of these test bullets had at least one measurable land and groove at the base of the bullet and land and groove impressions at the nose of the bullets. (Diagrams 2, 3 & 4)

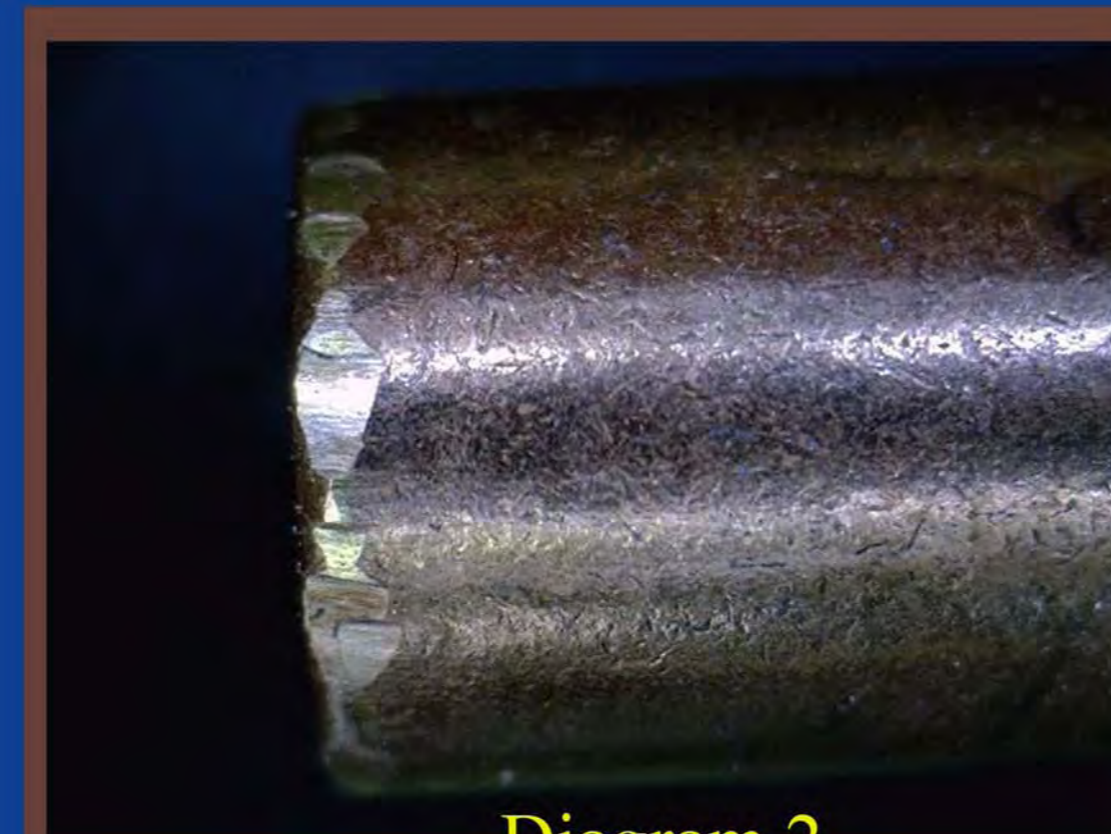


Diagram 2



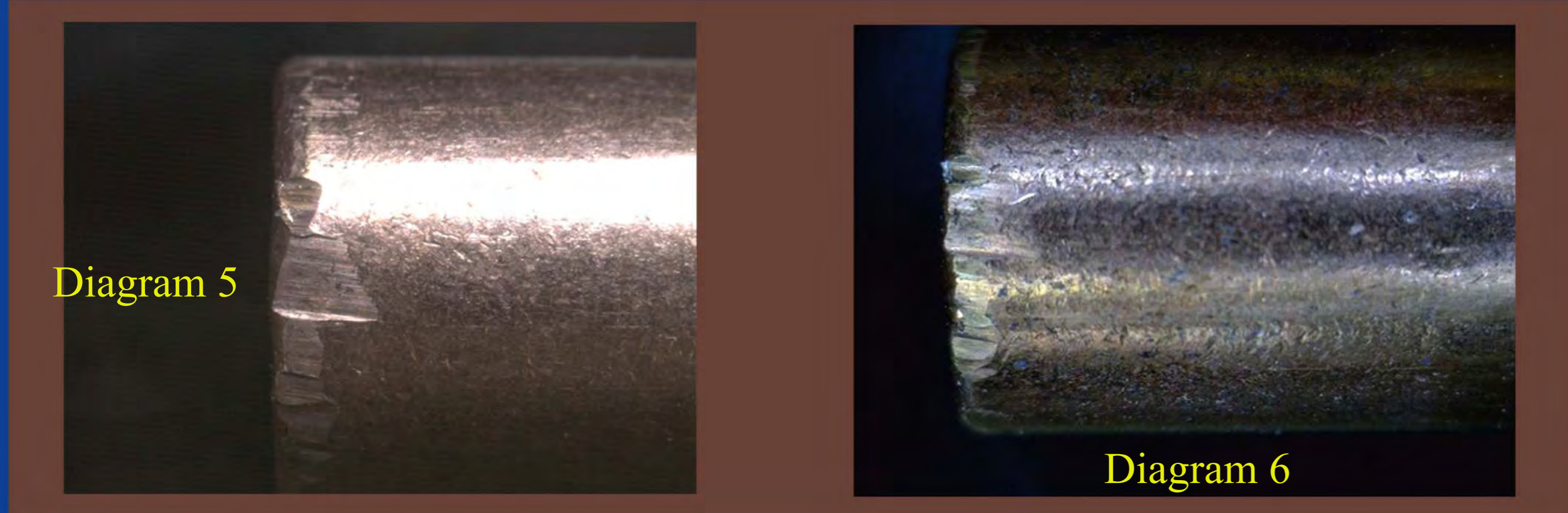
Diagram 3



Diagram 4

There is also enough detail for a possible match back to the firearm. (Diagrams 5 & 6) The cartridge cases were blown out and cracked from the neck to about half way down the cartridge case.

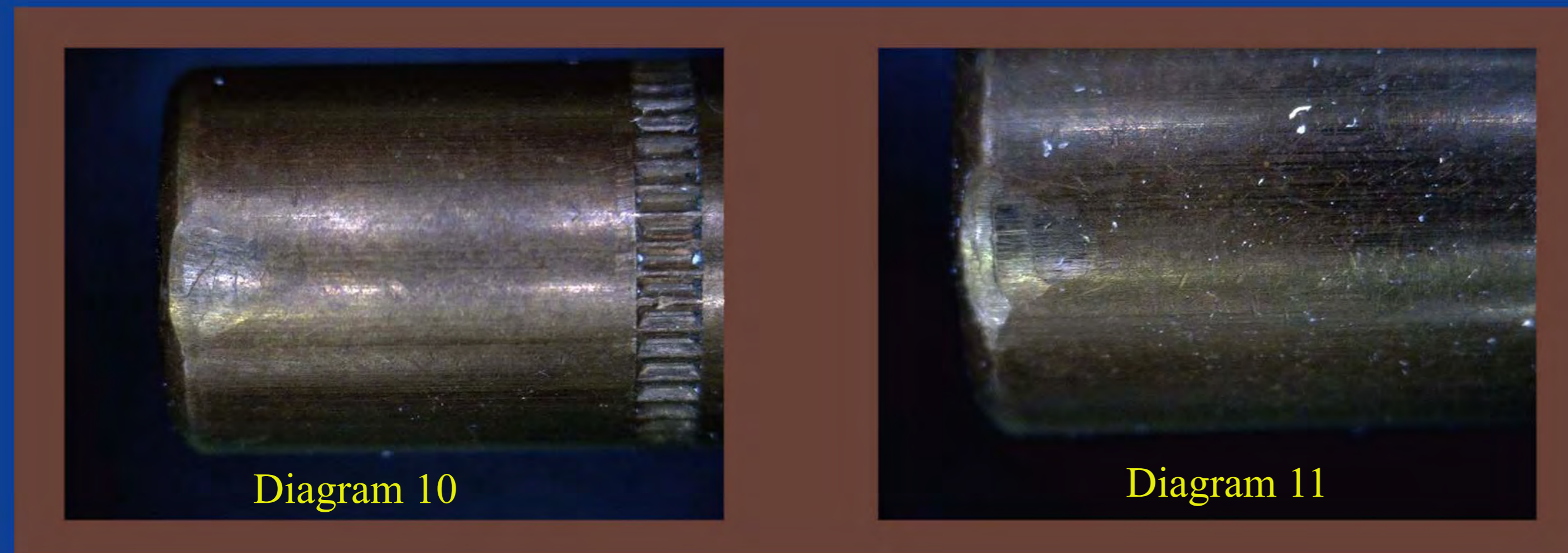
Next, a test was done to see if a 30-30 Winchester could be fired in a 410 shotgun. An Ithaca Model 66 Super Single, single shot break open shotgun was taken from the section reference library. (Diagram 7) An inert 30-30 Winchester cartridge was chambered in the shotgun. While the cartridge did not fit tightly in the chamber, the rim was fully supported. It was then decided to do a live fire test.



Two (2) PMC 30-30 Winchester cartridges were used to fire into a horizontal water tank, allowing recovery of the bullets. Next, three (3) PMC 30-30 Winchester cartridges were used to fire across a chronograph to record muzzle velocities. An Oehler Model 35P chronograph with three screens was used for the test. The velocities recorded were very erratic and showed velocities from 352 fps to 1201 fps. (Diagram 8)

The velocity recorded between the first and second screen and the second and third screen showed that the bullet was rapidly decelerating immediately after exit from the muzzle. These low velocities would, in most cases, be just enough to penetrate skin. When fired in the 410 shotgun, the 30-30 Winchester cartridges sounded and felt more like shooting a firearm in caliber 22 Long Rifle. There was no recoil and a very mild report. The cartridge cases removed after firing all showed the same characteristics. They were blown out and cracked from the neck to about half way down the cartridge case. (Diagram 9)

The rest of the cartridge case was generally left intact, but may have a split in the side below the blown out portion of the case. The bullets recovered from the water tank both had the same characteristics as the evidence bullet. There was no damage to the bullet and no rifling marks of any kind. The only marks found were a slight flat spot at the base with some very fine striations. (Diagrams 10 & 11) One of the bullets also had a small mark near the nose, which was not observed on the original evidence bullet.



Oehler Model 35P Chronograph printout of three shots fired from an Ithaca 410 shotgun firing PMC 30-30 Winchester cartridges loaded with 150 grain bullets.

1201-01-0932	*
1023-02-0352	*
0611-03-0705	*

03-0932	+
03-0352	-
03-0580	E
03-0663	M
03-0292	S

Our test showed that a 30-30 Winchester cartridge can be fired in a 410 shotgun. The resulting lack of land and groove impressions on the fired bullet and the very slow velocities observed, closely match what was observed on the evidence bullet and the non-life threatening wound received by the victim. While some small spots with fine detail were found on the bullets, this detail could have come from contact anywhere in the barrel and would be random and unrepeatable. We were unable to give the submitting agency a list of possible firearms, but were able to inform them of our test results.

*Note: The original submitted evidence bullet was not photographed at the time the case was worked due to lack of suitable equipment to take detailed pictures.