

CONSECUTIVE REVOLVER BARRELS

BY

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A topic of discussion that often comes up in the firearms identification field deals with rifled barrels that have been consecutively manufactured. The first question that always has to be answered is whether or not bullets from two barrels, one made right after the other, possess sufficient individual characteristics that would enable the firearms examiner to distinguish which barrel an evidence bullet was fired through.

The possibility of ever encountering two consecutive barrels in an actual criminal case remain very remote; however that possibility does exist. The first problem in determining whether a difference does exist lies with being able to obtain two successive barrels. Mere serial number sequence has no significance, because firearms manufacturers usually have assembly line procedures that join the various weapons parts, without regard to actual manufacturing sequence.

With the assistance of the Smith & Wesson firearms manufacturing plant our problem was soon over-come, and at our request, two .38 special test barrels were furnished to the U.S. Army Criminal Investigation Laboratory. The two barrels were taken from the normal factory-run barrel stock and controlled under the supervision of the plant superintendent during the rifling and honing phases of barrel manufacturing. The barrels were stamped with the numbers "1" and "2" and then were consecutively rifled and honed by the same tools with the same tolerances.

For test firing purposes, barrels number "1" and "2" were alternately mounted on a .38 special Smith & Wesson Model 10 Revolver. In order to obtain a representation of various bullet markings, lead and full-metal jacketed bullets were used. Ammunition selected from laboratory stock, consisting of .38 special "Targetmaster," cartridges with 148 grain wad cutter lead bullets manufactured by Remington Arms; .38 special cartridges with 158 grain lead bullets manufactured by Remington Arms; and .38 special M-41 military issue cartridges with full-metal jacketed bullets, manufactured by Valcartier Industries Incorporated were fired through each of the barrels.

Using the two test barrels, six (6) rounds of ammunition were fired through each barrel. The recovered test bullets were individually marked and identified by one of the examiners. Then six (6) additional rounds were fired through each of the test barrels, and those bullets recovered and individually marked without disclosing their identity to any of the other examiners.

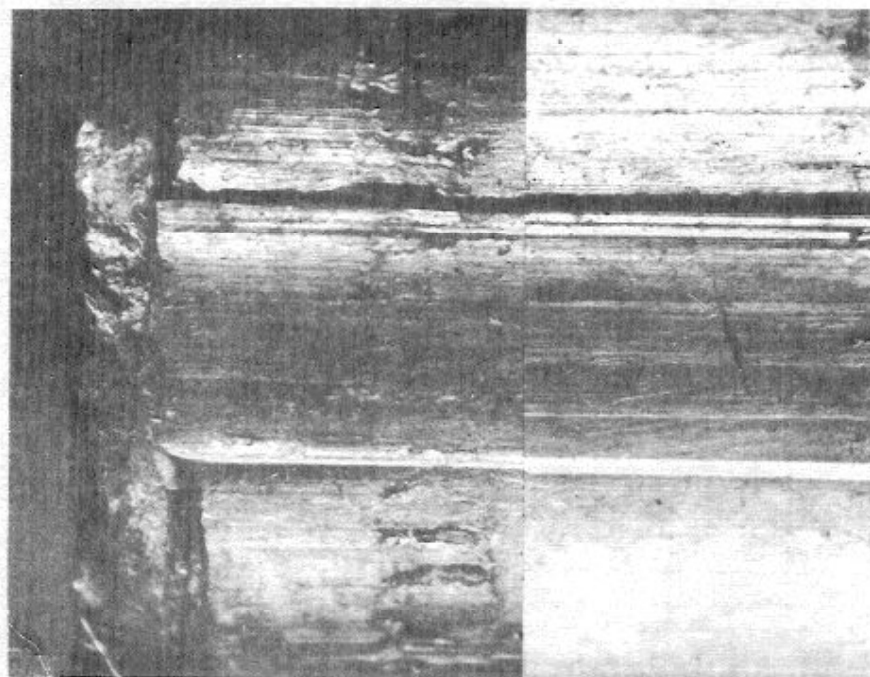
The advantage of having two unfired barrels offered the ultimate as far as similarities between two successive barrels. It is certain that the similar markings visible now would become less prominent after being subjected to normal firing, cleaning, and wear.

Examination of the bullets revealed many differences in the markings caused by each of the barrels. The question now was whether there were enough individual striae to tell which of the bullets were fired through each barrel?

The first group of recovered test bullets were microscopically compared in conjunction with the second group of bullets. Sufficient matching individual striae were noted on the bullets to enable the examiners to easily identify the barrel of origin for each of the bullets.

Similarities in class characteristics were noted; however, microscopic comparison of the bullets revealed that each barrel had caused different markings to such an extent that each land and groove impression on each of the bullets had a great number of individual identifying striae.

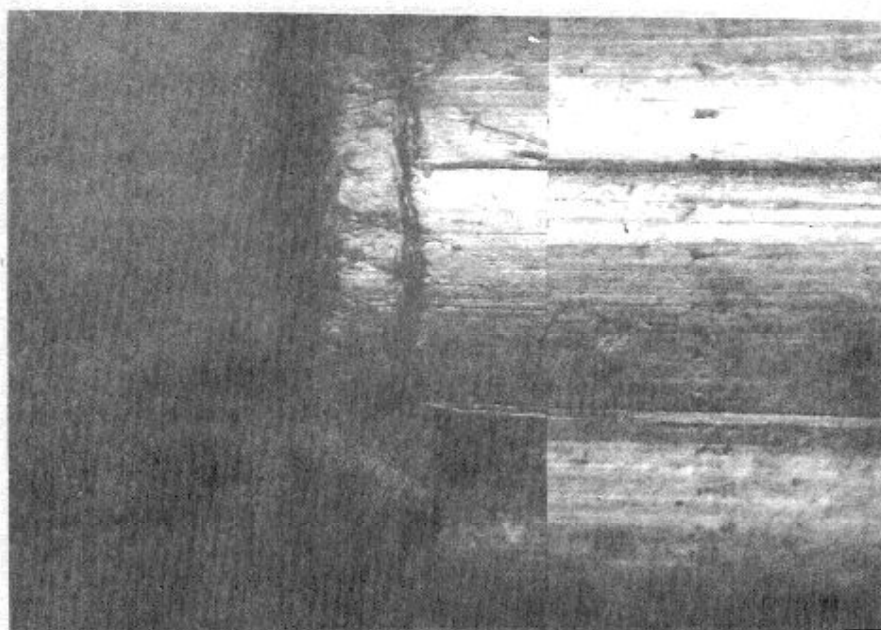
After the bullets had been identified, each land impression of the bullets fired through barrel number "1" was microscopically compared with each land impression of the bullets fired through barrel number "2". (See figures 1 thru 5)



Barrel "1"

Barrel "2"

Figure 1

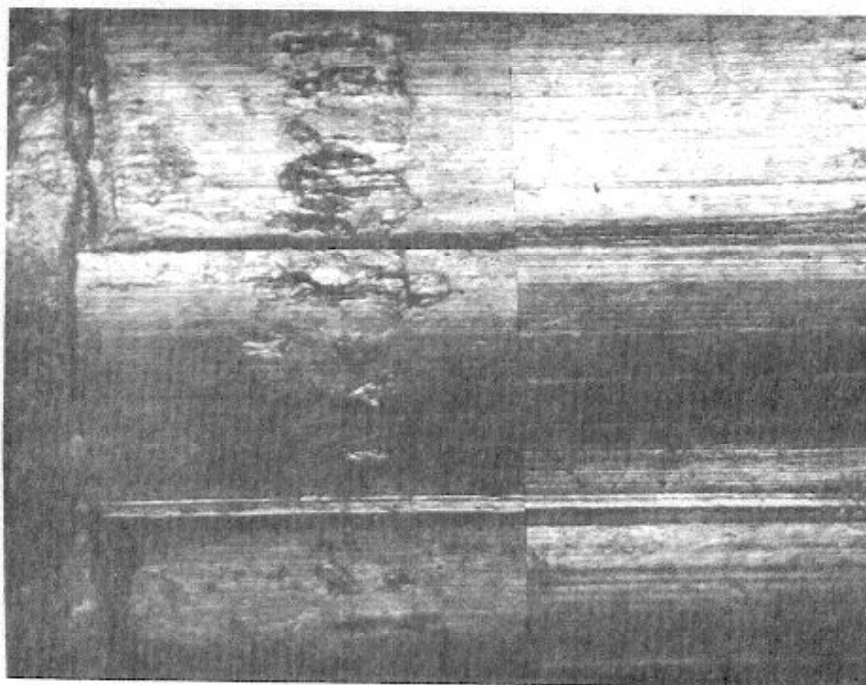


Barrel "1"

Figure 2

Barrel "2"

Land #2

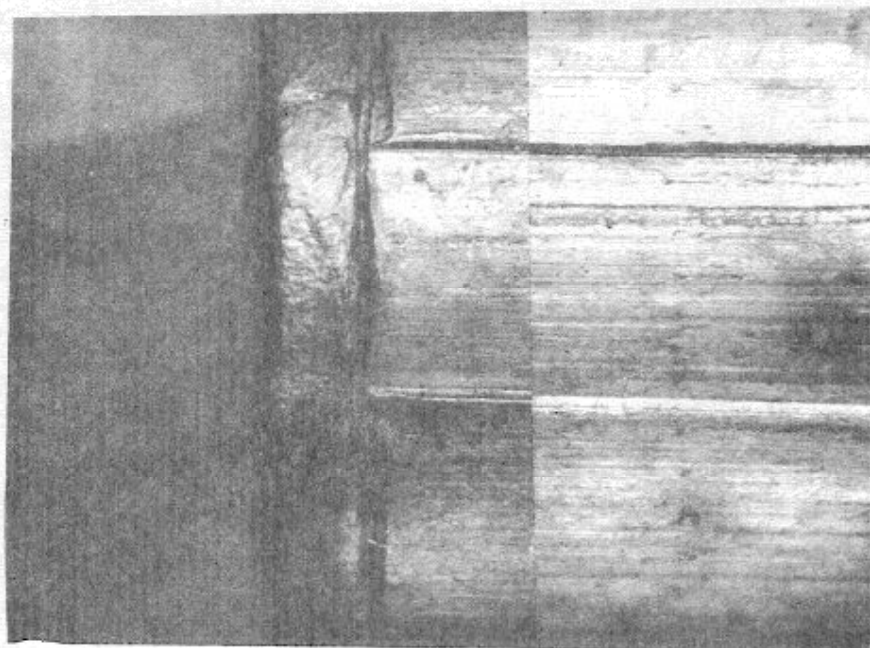


Barrel "1"

Figure 3

Barrel "2"

Land #3

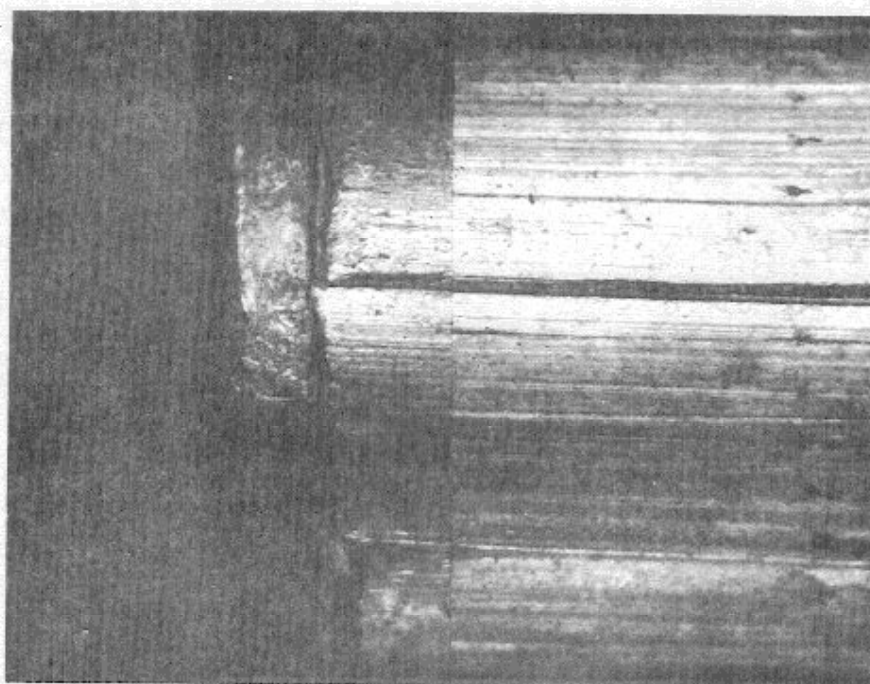


Land #4

Barrel "1"

Figure 4

Barrel "2"



Land #5

Barrel "1"

Figure 5

Barrel "2"

As shown by figures 1 thru 5, the land impressions from barrel "1" when compared with the land impressions from barrel "2", have many dissimilarities. Even though barrel "2" was rifled and honed immediately after barrel "1", there is evidence that the tools have been changed enough to make a significant difference in the succeeding barrel. It should be noted that the bullet from barrel "2" has developed many additional markings that are not present on the bullet from barrel "1". And it can be seen that some of the markings that were on the bullet from barrel "1" are not on the bullet from barrel "2".

Due to the great number of differences noted between the markings on the bullets fired through each of the barrels, there was no difficulty in determining which barrel any of the bullets had been fired through.

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