

BULLETS, THREADS, FILMS**Commission Called In Experts**By DAVID BRAATEN
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Faced with meager and conflicting eyewitness testimony and the death of Lee Oswald at the hands of Jack Ruby, the Warren Commission relied heavily on technical experts to interpret the bits and pieces of circumstantial evidence surrounding the Kennedy assassination.

Experts on fingerprints, handwriting, firearms and ballistics, fibers, medicine and photography — even a surveyor — were called on.

Ballistics experts traced a nearly whole bullet that rolled off Texas Gov. John Connally's stretcher, and two bullet fragments found in the presidential limousine, to the rifle found in the Texas School Book Depository Building.

From handwriting specialists, the commission learned that Oswald had purchased the rifle by mail, using an assumed name. And although no decipherable fingerprints were found on the outside of the gun, a clear print of Oswald's palm turned up on a portion of the barrel normally covered by the stock, proving that Oswald had held the disassembled gun at some time.

Fibers — orange-yellow, gray-black and dark blue — wedged between the wooden stock and the butt plate of the rifle matched fibers from the shirt Oswald was wearing the day of the assassination.

Marina's Snapshots

Enlargements of snapshots taken by Marina Oswald of her husband, posing in their backyard with a rifle, convinced an FBI expert — and the commission — that it was the assassination weapon.

And the authenticity of the one snapshot for which the negative existed was not left to Mrs. Oswald's testimony alone: The FBI technician testified that every box camera has minute imperfections in manufacture that leave a unique "signature" on a negative — in much the way a pistol or rifle marks a bullet fired from it.

More expert testimony concerning another Oswald palm print explained how Oswald got the rifle into the school book warehouse on Nov. 22. The print was found on a homemade paper bag discarded next to the window from which the fatal shots were fired. Oswald told a

friend who drove him to work that morning that the bag contained curtain rods.

The FBI's fiber expert found some fibers in the bag that matched a blanket in which, Mrs. Oswald testified, her husband kept the rifle at home.

Finally, a palm print and a fingerprint of Oswald's were discovered on one of the cardboard cartons the assassin piled up around his hiding place in front of the window. And the prints were relatively fresh, the experts decided, because the perspiration that causes them would otherwise have been absorbed into the cardboard.

Since witnesses to the assassination were confused in their testimony about the number and source of the shots, the FBI and the Secret Service staged a painstaking re-enactment of the assassination.

They used a surveyor to line up the supposed trajectory of the bullets, doctors' testimony

on the paths of the slugs that killed President Kennedy and wounded Gov. Connally, and an amateur photographer's movie film taken at street level to determine the location of the presidential limousine when the shots were fired.

Agents assumed the victims' positions in a similar limousine, and each split second of motion along the fatal stretch of road was traced from individual frames of the movie film.

The speed of the President's car was calculated exactly—11.2 miles per hour—from the speed of the movie frames.

Wound Conclusions

As each frame was re-enacted, photographs through the telescopic sight on the death weapon reconstructed accurately the assassin's view of his target.

The agents' poses in accordance with the movie film,

when viewed through the telescopic sight, helped the commission conclude that a single bullet wounded the President and the Governor, and that another bullet killed the President.

In a careful, if grisly, experiment, scientists at Edgewood Arsenal showed that President Kennedy had not, as was rumored, been killed by a dum-dum bullet (a soft-nosed slug that shatters on impact to produce a massive wound).

With the assassin's rifle, standard ammunition was fired at reconstructed skulls from 270 feet, the approximate distance the fatal bullet traveled.

One bullet hit a skull at almost precisely the same point as the bullet that hit the President's head, and caused the same kind of massive wound.

The experts' work for the commission was never pleasant. But it was convincing.