

Procedures and equipment

(50) As noted, the panel conducted its examination at the Firearms Identification Section of the Washington, D.C., Metropolitan Police Department. These facilities were conveniently located to the National Archives and the select committee's offices, and were made available by Police Chief Maurice J. Cullinane and Firearms Section Supervisor George R. Wilson.

(51) The panel members met initially on August 24, 1977, with the committee and the technical assistant from the Metropolitan Police Department's Firearms Laboratory. At that time, the following examination procedures were adopted:

(52) Each panel member would independently examine and compare under a microscope the bullet recovered from Dr. King, the cartridge case found in the rifle, the bullets and cartridges test-fired by the panel (see below) and the bullets and cartridge cases received from the FBI and listed as having been fired in the rifle.

(53) The panel would jointly conduct microscopical, chemical and visual examinations of all other evidence, as well as of the rifle, bullets and cartridges test-fired in it (see below). Each examiner would keep individual worksheets and notes.

(54) Among the specific tests to be conducted were:

(55) Comparison of the bullets test-fired by the panel from the rifle (see below), and with bullets received from the FBI and listed as having been fired from the rifle.

(56) Comparison of the cartridge case found in the rifle with cartridge cases test-fired by the panel in the rifle, and with cartridge cases received from the FBI and listed as having been fired in the rifle.

(57) Comparison of the exterior of the rifle with an impression in the surface of the windowsill.

(58) Before discussing his findings with other panel members, each examiner would submit his individual notes and worksheets and a final report to the technical assistant.

(59) On completion of the individual examinations, the panel would meet to discuss the findings of each member, reexamine the evidence as necessary, and then prepare a final, joint report, to be submitted to the select committee.

(60) Members would not be shown the results of the earlier FBI tests. The FBI reports were, however, to be reviewed by the technical assistant.

(61) After considering the results of the FBI's neutron activation analysis, the committee decided not to conduct further examinations of this type. Because the elemental composition of the five Peters cartridge box commercial-type cartridges differed, they could not be used as standards of comparison with the bullet recovered from Dr. King's body.

(62) As noted, the panel was to conduct visual and microscopical examinations, as necessary, on each item of evidence. A summary of general principles follows:

(63) A cartridge, or round of ammunition, consists of a cartridge case, primer, powder, and bullet. The primer contains a detonable mixture and fits into the base of the cartridge case, which contains powder. The bullet, constructed of lead or a lead core encased in a

knot. A small bit of material had been cut from the rear of the neck band and two small bits from the inside lining.

(127) Visual and microscopical examination revealed no unburned or partially burned gunpowder particles in the severed area. The Griess test for nitrites was negative. The sodium rhodizonate test for lead was positive on the light-colored strand of lining protruding from the severed edge of the tie.

(128) The Q78 suit coat was visually, microscopically and chemically examined (fig. 9). It had been cut on the right sleeve and across the right chest. Small bits of material had been cut from the right upper sleeve area and the inner lining. The coat was extensively bloodstained. The upper right lapel area shows a series of irregular, tear-like holes in the outer layer of cloth. No penetration of the interfacing of the lapel was noted.

(129) Visual and microscopical examination revealed no unburned or partially burned gunpowder particles. The Griess test for nitrites was negative. Sodium rhodizonate testing revealed several areas with lead particles around the damaged right lapel area.

(130) Based on the visual, microscopical and chemical examinations of the clothing, the examination of the autopsy photographs of Dr. King, and considering the relative position of the garments when worn in the usual manner, the panel concluded that all damage to the Q76 shirt, Q77 necktie and Q78 jacket was consistent with the damage that would be caused by a high velocity bullet which fragmented on impact, and by the resultant secondary missiles such as bone and teeth fragments. The absence of gunpowder residues indicates that a firearm was not discharged in close proximity to the garments.

Summary of the findings

(131) Every effort was made by the firearms panel to identify or eliminate the Q64 bullet as having been fired from the Q2 rifle. The panel conducted numerous microscopical comparisons among bullets test-fired from the Q2 rifle by the panel and by the FBI. Not only could the Q64 bullet not be identified or eliminated through comparisons with test-fired bullets, but the test-fired bullets could not, in a majority of cases, be identified with one another, although they are known to have been fired from the same rifle.

(132) The panel found that the Q2 rifle, when the type of high velocity ammunition that was recovered in this case was used, did not produce similar individual identifying characteristics with any degree of consistency on bullets fired through it. Because of this situation, the panel could not identify or eliminate the Q64 bullet as having been fired from the Q2 rifle.

(133) The panel was able to determine, based on visual and microscopical examination, that the Q64 bullet is of the same type as the bullet portions of the Q4-Q8 cartridges. Thus, Q64 is the deformed bullet portion of a commercial-type .30-06 Springfield caliber cartridge of Remington-Peters manufacture and is unlike the bullet portions of the Q9-Q12 Remington Arms cartridges, which are military-type.

(134) The panel determined that the Q3 cartridge case was fired in the Q2 rifle and had most probably been loaded into that rifle through the magazine rather than directly into the chamber. Further, the Q4-

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stronger metal jacket, fits into the mouth of the cartridge case. A bullet is fired by placing the cartridge in the chamber of the firearm. The cartridge base rests against a solid support, called a breech or bolt face. When the trigger is pulled, the firing pin strikes the primer, igniting the detonable mixture, which in turn ignites the powder in the cartridge case. The combustion propels the bullet through the barrel.

(64) The bore (inside of the barrel) of modern firearms is rifled with spiral grooves in it to give bullets fired through it a spinning motion for flight stability. The raised portions between the grooves are called lands. The number, width and direction of twist of the lands and grooves are called the class characteristics of a barrel.

(65) In addition to the class characteristics, the components of every firearm, such as the barrel, firingpin and breech face, bear distinctive microscopic characteristics. While the class characteristics are common to all firearms of a given model and manufacture, an individual firearm's microscopic characteristics differ from all other firearms, regardless of model or manufacture. These distinctive markings, usually referred to as individual identifying characteristics, are produced initially by the manufacturing tools, which change microscopically during operation and vary from one firearm to another. Further individual identifying characteristics may be produced as the firearm is used, during its disuse, and as a consequence of maintenance or the lack of it.

(66) When a firearm is discharged, the individual identifying characteristics of its barrel, as well as its class characteristics, are engraved on the bearing surface of the bullet. The individual identifying characteristics of the firingpin and breech or bolt face are impressed on the base or primer of the cartridge case at the time of firing.

(67) Using a comparison microscope, an expert can compare the markings with those produced on a similar cartridge test-fired in the same firearm. If the patterns of the microscopic markings are sufficiently similar, it can be concluded that both cartridge cases were fired in the same firearm.

(68) Microscopical examination of other firearm components and the markings they produce may also demonstrate such things as whether a cartridge was ever loaded into a particular firearm or was loaded into a firearm more than once. It is also possible, through comparative microscopical examinations, to determine whether two bullets were fired from the same firearm.

(69) The committee obtained the firearms evidence from the Criminal Court of Shelby County, Tenn., on March 11, 1977; the autopsy photographs came from the office of the Shelby County medical examiner. All items of evidence were inventoried before and after being transferred to and from the police laboratory in Washington in August and September. Deputy Clerk of the Criminal Court of Shelby County, Charles Koster, came to Washington on August 24, 1977, to oversee the transfer of the firearms evidence to the police laboratory and to review security precautions generally. The evidence was secured in a safe in the laboratory; a log was maintained to record when the evidence was removed for examination.

(70) The bullets and cartridge cases test-fired by the FBI from the rifle were obtained for the committee from Special Agent Cort

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Were any of the Q4-Q12 cartridges ever loaded into the chamber or magazine of the Q2 rifle or any other firearm?

(118) Visual and microscopical examination of the cartridges by the panel revealed no extractor, ejector or other marks to indicate that they were ever loaded in the magazine or chamber of the Q2 rifle or any other firearm.

(119) The panel did find marks within the extractor grooves of the Q4-Q8 cartridges similar to those made by an inertia-type bullet puller. Because the cartridges were originally recovered intact, the panel assumed that the FBI laboratory had taken the cartridges apart for its examinations.

(120) The panel found a series of marks and striations in the extractor grooves, on the sides and across the bases of the Q9-Q12 cartridges that differed significantly from the marks and striations that the Q2 rifle leaves. The panel concluded that these cartridges once were part of a disintegrating machinegun link belt or were contained in an eight-round clip of the type used with the Garand M1 rifle. (See fig. 18.)

Did the Q2 rifle cause the indentation on the surface of the Q71 windowsill?

(121) The windowsill board was examined visually, microscopically and chemically. The sodium rhodizonate test for lead, conducted at a point on Q71 removed from the impression area, was positive, indicating possible contamination from lead in the paint. The Griess test for nitrites from gunpowder residues yielded negative results. The panel decided that nothing of significant value would be obtained by further testing.

(122) Evidence of class characteristics (size and form) which could indicate the type of object making the indentation were likewise not found.

(123) The panel concluded that class and other characteristics were insufficient either for identifying or eliminating the Q2 rifle with respect to the indentation. (See figs. 6A and 6B.)

Was the damage to Dr. King's Q76 shirt, Q77 necktie and Q78 suit coat produced by a bullet, bullet fragments or something else?

(124) The Q76 shirt was visually, microscopically and chemically examined (figs. 7A and 7B). It has been cut across the left and right front and on both sleeves. A small rectangular bit of material had been removed from the back collar area, as well as two small rectangular bits of material from the left cuff area. The collar button and part of the right collar stay were missing. The shirt was extensively blood-stained.

(125) The shirt had a large, elongated hole of irregular shape in the right point area of the collar, extending below the collar line. Visual and microscopical examination revealed no partially burned or unburned gunpowder in this area. The Griess test for nitrites indicated no gunpowder residue. The sodium rhodizonate test for lead showed lead particles at the perimeter of the hole in the right collar area.

(126) The Q77 tie was visually, microscopically and chemically examined (fig. 8). It was completely severed next to the right side of the

knot. A small bit of material had been cut from the rear of the neck band and two small bits from the inside lining.

(127) Visual and microscopical examination revealed no unburned or partially burned gunpowder particles in the severed area. The Griess test for nitrites was negative. The sodium rhodizonate test for lead was positive on the light-colored strand of lining protruding from the severed edge of the tie.

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