THE MEDICAL EVIDENCE IN THE ASSASSINATION OF PRESIDENT JOHN F. KENNEDY

CYRIL H. WECHT and ROBERT P. SMITH

a, Institute of Forensic Sciences, Duquesne University School of Law, Pittsburgh, Pa. and b, Office of the Coroner, Allegheny County, Pittsburgh, Pa. (U.S.A.)

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1. BACKGROUND

1.1. The assassination

Ten years ago, during a motorcade in Dallas, Texas, President John F. Kennedy was assassinated by gunfire before hundreds of horrified onlookers. The President was first seen to clutch at his throat, and then, a few seconds later, his skull was seen to burst. Reports of post-mortem examination later indicated that he was struck by two bullets, the first entering the upper right side of his back and the second entering the back of his head.

Five other persons were seated in the Presidential limousine, which was uncovered at the time. Mrs Kennedy was to the left of the President in the rear seat. John Connally,
The Authors of this paper are as follows: 

(Continued)
position of the rifle.

In an effort to restore the President's breathing, an endotracheal tube was inserted through the neck wound and connected to a respirator. When this proved ineffectual, a tracheotomy was performed to ensure a clear airway. The Parkland doctors also reported the insertion of chest tubes through surgical incisions in the chest.

The Commission also claimed satisfactory alignment of this wound with the Governor's chest wound (about 25 degrees). However, Art牟 stopped and quoted his coma and questioned the angle shown in the sketch, when in fact the sketch angle measures less than 20 degrees.

In an effort to determine whether the President survived the shooting, the Commission relied on an artist's sketch as its authority for the angle of the declination through the President's back/throat wound report- ing that an angle of 17 degrees was determined. The Commission's findings postulated that all the shots were fired from a certain point on the hori- zontal plane.

Moreover, the Commission's reconstruction required that this part of their calculation is almost meaningless. The bullet's path is so much confusion, contradiction, and vagueness that other rifle might raise the specter of a still larger conspiracy.

The Commission's findings pertaining to the President's head wound, with profuse bleeding and loss of brain tissue, and a much smaller wound in the anterior neck below the Adam's apple. The latter wound was designated as Commission Exhibit 3. The President was seen to have a massive head wound, with profuse bleeding and loss of brain tissue, and a much smaller wound in the anterior neck below the Adam's apple. The latter wound was designated as Commission Exhibit 3.

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instances the reference points for measurements were inept. For example, the vertical that he destroyed his "preliminary draft notes" Its the fireplace or his home on the morning that the President had been truck by two bullets and that both had been burned. One or two hours before the President's death, a path was "45 to 60 degrees" downward, and had no point of entry. The bullet which struck the President's back entered at a point "below the shoulders" of the Secret Service or the Dallas police. The FBI agents reported that subsequent revisions of the findings on the following day: The FBI agents reported that the outlet for this wound may be nationalized on the basis of the autopsies. The FBI agents reported that the outlet for this wound may be nationalized on the basis of the autopsies.
that the President's brain was preserved and that several sections were prepared for

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crusty te reported and provided important new details. Chief among these,

The FBI re

The X-rays and photographic materials give every indication of being authentic. Their

Numerous photographs and X-rays were taken in the course of the autopsy. The

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made, this time by a team

The President's clothing, medical sketches, the bullet and bullet fragments re-covered after

2.4. The autopsy material and reported cases on accent

Warren Report, the photographs and X-rays were reviewed by the autopsy team in the

warren Commission declined to examine these. relying instead on the testimony of the autopsy pathologists and a few...

The materials examined consist of X-rays, photographs and film

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1. OBSERVATIONS OF THE AUTOPSY MATERIALS

The President's brain is described only superficially in the autopsy report.

112 the head...
The tracheotomy incision is about 1.5 cm wide at the widest part of the gap. There is no apparent flap, and the edges are smooth. No specific tissue is present at the edges of the incision, and there is no evidence of Suturral-parietal hemispherical tissue. The area around the incision appears normal with no significant abnormalities. The wound in the upper hack is slightly elliptical, with the longer axis in the horizontal direction, measuring about 5 mm x 7 mm. A darkened, abraded rim around the upper and right margins adds to the appearance of the wound. The flaps may be ascertained inasmuch as the flaps are not easily identified in the photographs. The wound in the upper hack is similar to the wound in the neck. X-rays of this region disclose densities associated with the entry wound, suggesting that its nature is most likely from a gunshot wound.

There are no metallic densities visible in the correspondingly similar region. The wounds in the neck are consistent with the findings of the Clark Panel in respect to slight variations in the measurements. The wound in the neck is not as deep as the wound in the hack, and the area near and to the left of the entry wound is more circular. There are no signs of metallic fragments in the X-rays which can be readily associated with it. There are no signs of metallic fragments in the X-rays which can be readily associated with it. There are no signs of metallic fragments in the X-rays which can be readily associated with it. There are no signs of metallic fragments in the X-rays which can be readily associated with it.

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4. The hark medical data

Photographs of the President's back wound indicate that its center is located about a 14\(\times\)11 square. This photograph, at the center of the President, was taken within a few seconds after the final shot. The window believed by the Warren Commission to have been the Musson from which the shots were fired, is located in the upper left corner of the picture as also known to have been open as the President was shot. Measurements and calibrations by the authors indicate that at least two shots were fired from locations substantially farther west (leftward in the photograph) of the outbuildings shown by the Commission. An irregular notch at the midpoint of its lower mandible, possibly caused by the endotracheal tube used by the Parkland Hospital doctors. Lack of sharp focus in the photographs showing the tracheotomy prevented the author from identifying and locating the alleged exit wound of the bullet. X-rays of Governor Connally's chest reveal a number of small particles suggestive of metallic fragments. Although very small, they appear to be metallic. (The report of the Clark Panel gives rise to the belief that these X-rays of Governor Connally were examined by them.)

INTERPRETATION OF THE DATA

In the第一次 (first) approximation, the photographs of the President's back indicate that the impact point was located about a 14\(\times\)11 square. This photograph, at the center of the President, was taken within a few seconds after the final shot. The window believed by the Warren Commission to have been the Musson from which the shots were fired, is located in the upper left corner of the picture as also known to have been open as the President was shot. Measurements and calibrations by the authors indicate that at least two shots were fired from locations substantially farther west (leftward in the photograph) of the outbuildings shown by the Commission. An irregular notch at the midpoint of its lower mandible, possibly caused by the endotracheal tube used by the Parkland Hospital doctors. Lack of sharp focus in the photographs showing the tracheotomy prevented the author from identifying and locating the alleged exit wound of the bullet. X-rays of Governor Connally's chest reveal a number of small particles suggestive of metallic fragments. Although very small, they appear to be metallic. (The report of the Clark Panel gives rise to the belief that these X-rays of Governor Connally were examined by them.)

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The Governor's right arm was penetrated near the wrist, the bullet or missile entering the back side 2 cm above the wrist and exiting from the palm about 2 cm above the crease of the wrist. The right radius suffered a comminuted fracture with deposition of several particles of lead.

The Governor's left thigh received a puncture wound in the medial aspect of the distal thigh, with a small metal fragment resected by X-rays to be embedded in the femur.

The pathway of the bullet which struck the President's head is not amenable to the same kind of calculation. The bullet fragmented, and the points of exit of the fragments are not known with any precision. Nor, because of the bone impact and fragmentation, is it likely that the bullet fragments followed a course in line with the original flight path. Because of the extensive loss of skull, it cannot be absolutely concluded that more than one entry wound was present. However, one entry wound is definitely identifiable, and its location high near the rear of the skull points to a rearward location for the source of the shot.

The data on the wounds of Governor Connally establish that he was struck by a bullet which entered the far right side of the back near the scapula, the corresponding exit wound being in the right chest just above the nipple. Angular measurements on this wound as reported by witnesses before the Warren Commission estimate that the bullet was striking downward at an angle of 25 degrees and a right-to-left angle of 20 degrees relative to the appropriate planes through the Governor's body. A portion of the fifth rib on the right side was broken by this bullet.
Diagrams of the car show the separation between the seats, hack to hack, to be about one and a half seconds. Tests of the Mannlicher-Careano rifle found at the scene have established that it cannot be fired twice consecutively in less than 23 seconds.

The nearly whole bullet recovered at the scene had a 3-degree dope on the street. The nearly whole bullet and the nearly whole bullet recovered at the scene had a 3-degree dope on the street. The nearly whole bullet and the nearly whole bullet recovered at the scene had a 3-degree dope on the street. The nearly whole bullet and the nearly whole bullet recovered at the scene had a 3-degree dope on the street.

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The suspected assassin's site (second floor window) looked down on the Presidential suite and the area that varied from 22 to 26 degrees as the bullet recoiled, the corresponding sight association varied from 47 to 21 degrees. The street level slopes down toward the suspect window by about 18 degrees. Motion picture and still photographs taken just before or during the early portion of the interval when the President and Governor could have received their fatal wounds show both men to have turned their heads to the right, but that the upper parts of their profiles were obscured. The Warren Commission postulated that this bullet penetrated the President's tippet back and lower neck, traversed Governor Connally's chest (sheltering a bullet that was by then pinned to the right arm near the wrist) and entered his left thigh, depositing a metal particle in the femur. Metal particles have been seen in X-rays of these wounds, one on the Governor's wrist having been removed and found to be lead weighing half a gram. Yet the bullet is unashamed as evidence for the Battenberg of the base, and its weight is almost equal to that of damaged lead bullets found in the same gun aside from the rifle. The surface of the bullet is unscratched. Further evidence that could be offered are the following points:

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and bullet fragments recovered aggregated only 11/2 bullets altogether. The Commission

was lost, since the bullet

the

longitudinal axis

This is not at all implausible. considering the confusion that ensued at the scene immedi- ately after the assassination. The Warren Commission itself, having concluded that three shots were tired, was forced to concede that one whole bullet

's body was appreciably turned, tilted, or displaced relative

from that other rifle was not recovered, nor was the rifle itself.

We

have three major objections to the Commission's "single-bullet theory", name-

ly the near-pristine condition of Exhibit 399, the impossibility of the bullet

's back/sleek wound measures only about 114 degrees, while that through

the Governor's chest is larger, namely about 25 degrees. The indicated lateral angles (right to left in the horizontal

plane) show depositions of metallic fragments. This is

the observation that all foals wound sites

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The available evidence, assuming its validity, gives no support to titles which postulate gunmen to the left or right of the Presidential car. The wound in the President's back, evidenced in the autopsy photographs and X-rays, can only have been fired from a location behind the President. However, it cannot be determined whether this aim was fired from the same location or locations as the shots which caused the non-fatal wounds.

If any other bullet struck the President's head, whether before, after, or simultaneously with the known shot, there is no evidence for it in the available autopsy materials. The absence or unavailability of certain evidence in this case leaves a number of residual doubts and unexplained mysteries. The missing evidence includes several autopsy items — the preserved brain, several small pieces of bone, and bullet fragments. All of these items are known to have existed at one time or another. The continued withholding of these items leaves important questions unanswered and is a disservice to the nation.

For example, the detailed data from the spectrographic analysis and from the neutron activation analysis of the bullet, Commission Exhibit 399, and the various bullet fragments and lead particles recovered, could settle a number of questions important in reconstructing the shooting. For example, did the lead in Commission Exhibit 399, or is it not? Does its composition match that of any other fragment recovered, e.g., one of the large fragments found in the front of the car? Is the copper in the two large fragments round in the front of the car from the same bullet or from two different bullets? From what bullet or fragment did the lead found on the inside of the windshield originate? Or the lead smear found on the street curb in the vicinity? Are there any fragments or particles whose composition indicates a different manufacturer from the others?

Such questions cannot be answered by good analytical work. And in a case so fraught with difficulties in explaining the shooting, there can be no adequate answer to these questions.
Instructions were given to the autopsy doctors which prevented the performance of important procedures, such as dissection of an observed wound in the upper back and the sectioning of the brain.

Too many extraneous personnel were in attendance, while highly qualified civilian forensic pathologists, who might have ensured a thorough autopsy, were deliberately not invited.

5.2 Governmental handling and disclosure of evidence

The Government's handling of the evidence in the case created much unnecessary confusion and skepticism. The FBI itself was unaware, for almost two months as reflected in their official reports, that the autopsy team had corrected itself the day after the autopsy and concluded that a bullet had exited from the President's throat. Photographs and X-rays of the President's body were not examined by the Warren Commission, and instead reliance was placed on artist's sketches and verbal descriptions which were later found to be in error.

After the Warren Report was published, the Government continued to withhold fundamental medical and other evidence. The autopsy photographs and X-rays have been kept secret from the public and, until recently, they have even been withheld from qualified, independent, non-government pathologists.

Important analytical data concerning the bullet and bullet fragments continue to be withheld. The data could settle a number of critical questions about the details of the shooting; the data are known to have been acquired by the FBI laboratory, but there is no indication that the Warren Commission ever saw them or even asked for them.

Certain important autopsy materials, including the preserved brain, certain tissue and skin sections, and several photographs are unavailable and unaccounted for.

5.3 Present state of knowledge of the details of the shooting

The Warren Commission's "single-bullet theory" is untenable, and the Commission's conclusion that there was only one assassin cannot be reconciled with available evidence. Medical and photographic data, including measurements of wound angles and calculations of bullet trajectories, strongly suggest that there were two rifles used. The indicated locations are in the same building concluded by the Warren Commission to be the site of a lone assassin, but at points further west in this building and on two different floors.

So far as the available medical evidence shows, all shots were fired from the rear. No support can be found for theories which postulate gunmen to the front or right-front of the Presidential car. The medical evidence indicates that the President's back was hit by one bullet and that his head was hit by one other bullet only.

Residual doubts exist about the details of the shooting. At least some of these can be cleared up by making all of the autopsy materials available, and by releasing the detailed FBI laboratory data on the spectrographic and neutron activation analyses of the bullet and bullet fragments recovered.