JFK's Assassination
Conspiracy, Forensic Science, and Common Sense

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The Journal interviews with Humes and Boswell,1 the Dallas physicians,2 and Finck3 cleared up many of the events surrounding the attempted resurrection and subsequent autopsy of President Kennedy. However, correspondence to THE JOURNAL indicates many physicians are still sympathetic to a key conspiracy tenet regarding the Kennedy assassination: that the autopsy physicians conspired with the military, the Central Intelligence Agency (CIA), the Federal Bureau of Investigation (FBI), the Secret Service, and other agencies of government to disguise and suppress medical evidence that would show President Kennedy was publicly executed in Dealey Plaza on November 22, 1963, by multiple gunman.

Unfortunately, many of the arguments raised in the letters supporting such a complex conspiracy went unanswered. These arguments should be addressed in JAMA for several reasons.

See also pp 1507, 1544 and 1552.

First, for many physicians, the only contact they will have with arguments for and against conspiracy will be through THE JOURNAL. Second, judging from the letters, it is apparent that many physicians need education in the pertinent forensic and ballistic sciences that pertain to the assassination. Finally, JAMA should not perpetuate speculation based on medical misinformation or misunderstanding by physicians. Already, many conspirators are using JAMA's nonresponse to some of the letters as an endorsement of their claims.

Micozzi has responded to the question of the single-bullet theory, and readers are directed to JAMA for sources of further information. My discussion will focus on the letters to JAMA by Aguilar, Smith, Mantik, and White,4 which addressed the following issues: the putative alteration and forgery of the autopsy roentgenograms and photographs; the explosive head burst and backward movement of the President; the posterior ejection of blood and brain tissue; the differences in appearances of the wounds in Dallas and in Bethesda; and the small anterior neck wound. These issues are some of the least understood of the assassination and the most frequently raised by the conspiracies to advance their theories.

THE AUTOPSY ROENTGENOGRAMS AND PHOTOGRAPHS: FORGERY OR MISINTERPRETATION?

Aguilar, a medical panel member at the recent (proconspiracy) (Assassination Symposium on John F. Kennedy in Dallas) points out that the 6.5-mm fragment, so prominent on the published anteroposterior skull roentgenogram, was not mentioned in the original autopsy report or in subsequent testimony given by the autopsy physicians. He states that these physicians would not have failed to mention such an obvious radiographic finding if it was there. Thus, he implies, the published roentgenograms that show this fragment must be forgeries.

Aguilar's attempt to use a negative to prove a positive is pure conjecture and, in fact, proves nothing. There are several large fragments of metal evident on the roentgenograms, none of which was specifically mentioned in the report. One large 7x2-mm fragment, not commented on in description of the roentgenograms, was removed from the brain and given to the FBI. Besides, at the time the roentgenograms were taken, the autopsy physicians considered it likely that the bullet had not exited the body, because an exit site of the posterior neck wound had not been identified. Their immediate concern was locating a bullet they thought was still in the body, not identifying and locating each bullet fragment.

Furthermore, Aguilar5 does not indicate what advantage the conspirators would have gained by adding the fragment to the "forged" roentgenogram. There was already a bullet hole with intracranial bullet fragments coming out from it, soft-tissue swelling in the area of the wound, and small, inwardly depressed bone fragments from the inner table of the skull where the bullet entered. Surely that would have been enough to indicate an entrance wound at that level.

Aguilar5 and Mantik6 correctly point out that the Bethesda autopsy team described the rear head wound to be to the right and slightly above the external occipital protuberance (EOP), while subsequent forensic experts, using the autopsy photographs and roentgenograms, located the wound 10 cm above the EOP. Aguilar has discounted the possibility that three pathologists could have been wrong about the location of the wound and, instead, implies this is further evidence the roentgenograms and photos were forged or altered.

However, there are two reasons why it is unlikely that the bullet entered near the level just above the EOP. First, given the position of the President's head in frame 312 of the Zapruder film (the moment just before the head burst), for a bullet to enter just above the EOP and exit the right frontotemporoparietal area, it would have had to travel in an upward direction, fired from inside the limousine's trunk. Not even the most radical or imaginative of the conspiracies has supposed a sniper to have been in this location.

Furthermore, Boswell's testimony and autopsy drawings refute such a low en-
The technician is one of many responsible for the claim that the anteroposterior view shows the right upper third of the face is missing, while the autopsy photographs show the face is intact. Unfortunately, this claim was reinforced in the television program Inside Edition by Robert McClelland, MD, one of the Parkland Hospital surgeons who participated in the attempt to resuscitate President Kennedy, when he stated that some skull roentgenograms "show what appears to be the entire right side of the skull gone, with a portion of the orbit—that's the skull around the eye—missing too."44 According to the face in this area mismatch is yet another indication that the roentgenograms and photographs are fakes. However, this interpretation is also wrong. The "anteroposterior" projection, but a modified Waters' view in which the roentgen beams project upward through the face, through the frontoparietal area of the skull, and then onto the x-ray film. Since the bone of the right frontoparietal area of the skull is missing, much more irradiation has reached the area of the film depleting the right upper third of the face, causing this area to be overpenetrated. Using a spotlight (or enhancing it by computer), one can "bring out" the right frontal sinus, the fractured (but entirely present) right orbit, the right nasal bones, and the frontal bone. The swollen and ecchymotic right orbit seen in the autopsy pictures and Humes' description of the instability of the area correspond precisely to the extensive right orbital fracture and frontal bone fractures seen on the available roentgenograms.

In considering their allegations of fraudulent roentgenograms, both Aguilar and Smith would do well to ask themselves the following two questions: (1) What sort of technology existed in the 1960s to produce a photographic negative (which is what a roentgenogram is) so exact, so precise, and so consistent in its subtle anatomic, radiographic, photographic, and pathological details that it could fool every forensic pathologist, anthropologist, and dentist who studied them? (Answer: none.) (2) There were two lateral roentgenograms, each depicting the same thing from slightly different angles, so why produce two fake roentgenograms?

The HEAD BURST AND BACKWARD MOVEMENT OF THE PRESIDENT

Mantik3 embraces the three most common assumptions made regarding the head wound: (1) that frame 313 of the Zapruder film, which depicts the head burst, is the moment of bullet impact; (2) that the backward head and body movement is a reaction to the bullet impact; and (3) that a left posterior ejection of blood and brain tissue indicates the bullet entered from the front. Each of these assumptions is wrong.

An explosive head injury like the one suffered by President Kennedy results from the transfer of a bullet's kinetic energy to a temporary pressure cavity, which is produced as the bullet decelerates in its transit through the cranium. The cavity forms behind the bullet, and the pressure generated can be enormous: 700 to 1400 pounds per square inch. Since the skull is a closed, bony compartment that cannot expand, the pressure can only be relieved by a sudden burst.

The sequence of events is this: bullet impact; deceleration and pressure cavity formation; tumbling and fragmentation of the bullet; exit of fragments; further expansion of the pressure cavity; and, finally, head burst. The autopsy roentgenograms show the extensive bilateral fracturing of the skull typically produced by such a burst. Each Zapruder frame advances every 1/60 second, and the exposure time of each frame (the time the shutter is actually open) is 1/60 second. In 313, one can see a bone fragment that has ejected from the parietal region of the skull and has already reached a height of 6 to 8 feet in the air. Thus, by the time the shutter has closed in 313, the bullet has not only impacted the head, but has traveled through and exited the head. However, the head has not yet moved backward, nor does it start to move back until 315. Clearly, the impact of the bullet had nothing to do with the subsequent backward head movement.

The complex backward movement of the President, probably due to several interacting causes, is beyond the scope of this discussion. Alvarez45 and Lattimer et al46 provide further analysis. A reflexive pushing off of the president by Mrs Kennedy should also be considered as a contributing factor.

THE POSTERIOR EJECTION OF BLOOD AND BRAIN TISSUE AND THE 'OCcipital' WOUNDS: A SHOT FROM THE FRONT?

Mantik3 cites the reports of officers Hargis and Martin, the two motorcycle police riding to the left rear of the limousine who were splattered by blood and brain tissue. This so-called left posterior ejection is often cited as strong correlative evidence that the shot that hit President Kennedy in the head originated from his right front. However, the cloud of blood and brain visible in 313 did not exit in any given
plane, but exited as an expanding sphere spreading out in all directions. If one takes a pair of calipers to the entire circle of blood in 313, one finds it radiates from a point fairly well centered in the right frontotemporoparietal opening. The initial opening of the large skull defect occurred at the right frontotemporoparietal area because this is the weakest area of the skull and it is further weakened by exiting bullet fragments. As the hole enlarged and involved the superior right parietal area, tissue fanned out in all directions. However, it is not the exiting bullet frayed out but the normally enlarging pressure cavity that was responsible for the head burst and the dramatic ejection of material.

Furthermore, Mantik also discussed the discrepancy in the size, location, and appearance of the head wound between the Dallas and Bethesda examinations. This is hardly surprising. In Dallas, the physicians were trying desperately to save the President's life and were confronted with an actively bleeding wound comprising blood, brain, bone fragments, scalp flaps, and clot. Furthermore, the head wound gushed blood with each chest compression. Most likely, the large frontotemporoparietal bone flap, so evident on the Zapruder film, was closed over and was held in place by clot. Other adherent skin flaps, bone fragments, tissus, and coagulated blood no doubt concealed the true nature of the wound from the Dallas physicians who, as James Carville testified, inspected President Kennedy's wounds quickly "without taking the time to brush off the blood and debris" and left immediately after the President was pronounced dead.296

By the time the body had reached Bethesda, like that of the neck, is a typical site of small exit wounds. Interestingly enough, another error in judging entrance vs exit based on size was made in Dallas. Robert Shaw, MD, the thoracic surgeon who operated on Governor Connally's chest wounds, inspected the through-and-through wound of the Governor's right wrist. He judged the small 5-mm wound on the volar surface to be the entrance and the large 3-cm wound on the dorsum to be the exit.297 However, closer inspection of the wound at operation by Charles Gregory, MD, revealed that the large wound was the entrance and the small wound was the exit.298 This is simply not the case. There are three reasons why the morphology of this wound is easily compatible with an exit wound. First, a heavy metal-jacket, high-velocity bullet that loses very little velocity and does not deform or tumble as it passes through the body will often produce a small exit wound. Second, the skin of the neck may have been shored by President Kennedy's shirt collar. Finally, loose clothing or Nix films. (2) For this wound to have occurred. As the congealed blood liquefied en route from Dallas, it probably was absorbed by the towels and sheets surrounding the head, rendering the true nature and extent of the wound more apparent.

THE SMALL ANTERIOR NECK WOUND: ENTRANCE OR EXIT?

Mantik brings up President Kennedy's anterior neck wound and infers that a wound of 5 mm could not be an exit wound.300 The photograph shows several black-and-white autopsy photographs indirectly obtained from a Secret Service agent who had allegedly received them from his superior in December 1963.301 One of these photographs depicts the cranial cavity after reflection of the scalp and removal of the brain. The book's author purports this photograph shows a defect at the rear of the skull that contains part of an outwardly beveled exit wound, thus indicating a shot from the front. Judging from White's letter, it is apparent he does not realize the photograph has been published upside down. If he inverts the book, he will be able to correctly interpret the photograph. Shot from above and in front, the photograph actually depicts part of the large right frontotemporoparietal defect. Along one of the edges of the skull defect is a semicircular notch with beveling to the outer surface that was considered by the House Select Committee on Assassinations pathologists to represent a frontal exit wound. If White would review the House Select Committee on Assassinations pathologists' discussion with Humes and Boswell of this photograph and others similar to it,302 he will better understand what the photo represents.

The sketch of the wound as drawn by the Dallas physicians, which depicts a low, right posterior wound, is also cited as evidence that a shot fired from the front blew out the back of the President's head. The theory that there was a wound in this location has several problems: (1) The wound, as the Dallas physicians portrayed it, is not visible on the Zapruder or Nix films. (2) For this wound to have been created from a shot fired from anywhere behind the picket fence, the bullet would have had to enter the right front of the head at a sharp angle, then veer sharply to the President's right when inside the cranium to exit from the right occipital area. (3) This wound would have caused much of the right lambdaoidal surface to be missing. This nature is complete in the autopsy roentgenograms, and forensic anthropologists have verified its authenticity by comparison with skull films taken of President Kennedy during life. (4) I have not been able to find one Dealey Plaza eyewitness account describing a low right occipital wound. For instance, Special Agent Glen Bennett, who was in the Secret Service car behind President Kennedy, described it as a shot "that hit the right rear high of the President's head" [emphasis added].303 Bill Newman, who was standing just to the right of President Kennedy, stated, "By the time he was directly in front of me... he was hit in the side of the head [emphasis added].304 Both of these statements are compatible with the wound as seen on the Zapruder film and the roentgenograms. Not one of these witnesses described a wound in the low right posterior portion of the skull. The Dealey Plaza witnesses were probably reliable witnesses of the wound. Just after the head explosion, the wound was fresh, had not yet bled profusely and had not been altered by Mrs Kennedy, who had tried to put her husband's head back together on the way to Parkland Hospital.

THE APPEARANCE OF THE WOUNDS IN DALLAS AND IN BETHESDA

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FORENSIC SCIENCE AND COMMON SENSE

Proper forensic analysis of a homicide requires tremendous knowledge and experience. Yet even the experts at the Wound Ballistics Branch of the US Army Chemical Research and Development Laboratories at Edgewood Arsenal, Md., were surprised by the results of their investigations for the Warren Commission. An expert conducting experiments designed to simulate President Kennedy's wounds, Alfred Olivier, DVM, and his group used Lee Harvey Oswald's gun and fired the same type of bullet allegedly used by the assassin. The experiment was conducted with the aid of gelatin blocks or animal muscle. The bullets traversed the models intact and caused a small entrance and exit wound. To investigate the head wound, his group fired at gelatin-filled skulls from a distance of 270 feet, approximately the distance from the Texas School Book Depository to President Kennedy's head at the time of the fatal shot. Much to Olivier's surprise, the bullet fragmented inside the skull and caused an explosive exit wound. (Lattimer et al reported that the Western Cartridge Company, 6.5-mm bullet was capable of creating such an explosive exit.) Olivier, a scientist, used his findings to enhance his realm of expertise and he formed a reasonable conclusion: Oswald's rifle and ammunition were capable of inflicting both of President Kennedy's wounds. One must remember that what might seem unusual or even impossible to the inexperienced may be quite common to the expert. The relatively small amount of deformation of the so-called presidential bullet is a rallying cry for the conspirators. However, forensic pathologists with extensive gunshot wound experience do not find this unusual. Indeed, one well-known authority has told me that he has not only recovered full-metal-jacket bullets that have caused more bone and tissue destruction suffering less deformity than seen in the Parkland stretchers, but he has recovered completely nonformed, unjacketed .22-caliber lead bullets that have embedded into vertebral bodies (V. G. M. DiMaio, MD, oral communication, December 14, 1992).

The autopsy findings and all photographic and available assassination films support the fact that there were two shots from the rear. Although the preponderance of nonmedical evidence indicates that Lee Harvey Oswald acted alone as a maladjusted individual, killing President Kennedy with a Mannlicher-Cas- casso rifle, it cannot totally disprove his acting with (or being duped by) a small private group of conspirators in a plot to assassinate President Kennedy.

However, there are large problems of logic and common sense with the government-issued or government-involved conspiracy theories. If the Secret Service, the FBI, the CIA, and other agencies with close access to the President wanted to dispose of him, they could have fired their bullets from a number of covert means of dispatch. It is difficult to believe a government-led team of President's assassins came up with the following complex plan. First, take several years setting up Lee Harvey Oswald. Then, get him a job in the Texas School Book Depository so he could be in position kill the President and meticulously plant evidence with which to frame him. For the central piece of evidence, obtain a cheap mail-order rifle with an inexpensive sight. (Apparently no one thought to spend a few more dollars and get a more credible rifle.) Arrange to have the President fired upon from several different directions using at least three teams of marksmen. (Why would it take several teams of marksmen, not one, not two, but, by conspiracy, count, that the balls of fire to hit a slow-moving target at close range with the fatal head shot?) After the President is hit with multiple bullets from multiple directions, the military and numerous government agencies, beginning right at Parkland Hospital, move quickly to conceal multiple bullet holes from civilian physicians (or coerce them all into silence), while away bullets, alter the President's body, forge roentgenograms, and change every home movie and photograph of the assassination to conceal the true nature of the injuries and the number of accomplices involved.

The most astonishing feature of this plan is that the plotters would have to have been confident in advance they would be able to recover every bullet, fire every witness, control the movements of hundreds of witnesses, and destroy every photograph and home movie that had incriminating evidence and leave behind those that did not.

In the legendarily world of the Kennedy assassination conspiracy and its associated booming entertainment industry, any fact or finding that contradicts the popular Rube Goldberg scenario is dismissed as disinformation. Any contrary document or photograph is judged to be a government forgery. Any person or group who questions the conspirators' erroneous or unsubstantiated claims is denounced as coconspirator or dupe. This has been the fate of Henry, Boswell, and Finck. This has become the fate of the members of the Warren Commission. This is becoming the fate of Malcolm Perry, Jim Carrico, Charles Baxter, and M. T. Jenkins. Many members of the conspiracy crowd now claim that these highly successful physicians expressed conclusions in their reports that they had written months or years out of fear of retribution from as yet unidentified nefarious minions still at work in the government. Even JAMA, its editor, and the American Medical Association have been added to the strange conspiracy of accessories after the fact. As the years pass, one thing becomes abundantly clear: for the conspiraci, it is conspiracy above all else, including forensic science and, common sense.

References