

THE HSCA,  
THE ZAPRUDER FILM,  
AND THE  
SINGLE-BULLET THEORY

Raymond Marcus



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Introduction by David R. Wrone  
Professor of History,  
University of Wisconsin-Stevens Point



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THE ZAPRUDER FILM,  
AND THE  
SINGLE-BULLET THEORY

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**Raymond Marcus**

Dear Harold -  
I thought you  
might want to have  
a completed press-  
run copy. Thanks for  
your plug!

Sincerely,

Ray Marcus

Feb 17, 1993

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## **Introduction**

**by**

**David R. Wrone**

No other question so confounds the mind and disturbs the sense of order and rightness in American life than the fact that several individuals in numerous agencies of the federal government did deliberately, carefully, and in full possession of their wits lie, wrong and defraud the nation in the fake investigations into the assassination of President John F. Kennedy. The enormity of their crime cannot be overstated.

In the almost thirty years since the murder, the public has been deluged by wave after wave of books attacking the official version. Some of these--a relative few compared to the hundreds published--have been solid fact-based works that contribute significantly to the historical record. Many others have been carelessly concocted slapdash efforts; while still others bear the earmarks of deliberate misinformation.

The sheer volume and dubious value of much of this literature presents a serious problem of selection for those who become interested in the case. The public is bewildered. But the muddled books and multiplicity of theories serve another purpose too: in the midst of the confusion politicians and pundits and judges and historians behave as if they have gotten a reprieve from their responsibility. In a sense the American people's search for truth about JFK's murder has become a prisoner of theorists.

Now comes Ray Marcus with a booklet on one small section of the single-bullet theory that is clear, solid, and has no theorizing in it--not a word. It is a beam of sunlight punching through the dark clouds obscuring the murder, and is much welcomed.

The color reproductions of 29 Zapruder frames are essential for following his text. It is one of the very few places a concerned citizen can view some of the frames of this basic photographic source for study; the official investigations made certain that clear prints for forming minds independently of the federally imposed theory of Oswald-the-lone-assassin would not be available.

Some may remember Marcus' excellent booklet of 1966 with the superb title, The Bastard Bullet: A Search for Legitimacy for Commission Exhibit 399.

In The HSCA he states that a shot came at frame 189 and that it was frontal and hit JFK in the throat. In 1963-64 all federal agencies concluded that between frames 166 and 210 trees blocked the view of the motorcade from the sixth floor easternmost window where Oswald was said to have been. The Warren Commission said the first shot could only come after the motorcade passed beyond the trees, or frame 210. They said this shot caused all non-fatal wounds on JFK and Connally. The House Select Committee faced with factual impossibilities imposed by the surd, disagreed, saying the first shot came with frame 189. They asserted that a brief, 1/18th of a second, break in the foliage occurred at frame 186. With other legerdemain they then attempted to sustain the single-bullet theory, necessary to the lone-assassin-Lee Harvey Oswald official conclusion.

Marcus shows that a shot from the Depository at this frame is irrational, false, and a fraud. In addition to the logic of it, the human eye requires 1/6th second to register data and react, making the shot impossible and its assertion a cover-up by the HSCA. The shot, he convincingly demonstrates came from elsewhere and thus not from Oswald or anyone else in that window. But the learned scientists and seasoned pols who stirred up this witches' brew of a disgraceful investigation had no shame; certainly they did not care what had happened to JFK--or the nation, that day in November.

He also demonstrates the frames reveal a second shot hit JFK in the back at 225, which is mechanically impossible by the weapon alleged to have been used by Oswald and destroys the official conclusion. And, in what is an excellent portion, he shows that a hit struck Connally in the back near the right armpit at 237. His discussion of the frame sequences from 225 to 237 is definitive on Connally being struck immediately before he reacted, and not much earlier as both the Warren Commission and the HSCA claimed. 237 requires a separate shot. This is also mechanically impossible from 225 by the official assassin and destroys the official conclusion.

This accounts for three shots. But the official theory that makes Oswald the lone assassin can only use three bullets. How account for JFK's head wounds, and for citizen James Tague's wound? At least two additional bullets would be required. This means another gun or guns and other assassins.

Marcus restricts himself only to the series of frames mentioned.

It seems beyond question that he has proven shots hit JFK at 189 and 225 and Connally at 237. One can be cautious and say that it is possible the directions of the hits at 189 and 225 are open to further study--frontal or rear--but one cannot avoid the conclusion so convincingly provided here that there are shots independent of each other at 189, 225, and 237.

Again the Zapruder film disproves the cockamamie official "conclusion" that a single bullet created all non-fatal wounds.

With work like this Americans have solid, serious, scholarship, not tainted by theory. In twenty-two pages Marcus has done a lot. He shows we must be governed by fact, not fiction.

"Let's wash this concept in critical acid  
and observe how its perimeter contracts."

OLIVER WENDELL HOLMES

**THE HSCA, THE ZAPRUDER FILM,  
AND THE SINGLE-BULLET THEORY**

**Raymond Marcus**

In its Report issued in 1979, the House Select Committee on Assassinations (HSCA) concluded that at least one shot, which they say missed, was fired from the right front--the Grassy Knoll. They based their finding primarily on acoustical evidence. They nevertheless insisted, as did the Warren Commission, that only two shots struck the victims; both from the sixth-floor window of the Texas School Book Depository building. Since one shot obviously struck Kennedy's head at fr.313 of the Zapruder film, the HSCA was forced by its adopted theory of only two hits, to also agree with the Warren Commission's long discredited single-bullet theory--that JFK and Connally were struck by a single bullet which caused all their wounds, other than JFK's fatal head wound.

However, they differed with the Warren Commission as to when this double-hit occurred. The Commission said it happened sometime during the fr.210-225 interval, while Kennedy was hidden from Zapruder's camera view by the Stemmons Freeway sign. The HSCA photo panel says the hit occurred just prior to fr.190. Early in 1965, in my Hypotheses re: the Zapruder Film, I too had concluded that Kennedy was first hit at approximately fr.189 (but I believed then and now that this was a shot from the knoll, entering Kennedy's throat, and that it did not hit Connally). I based my conclusion on three criteria visible in the Zapruder film:

(1) that JFK's right hand, which had been raised in a head-high wave to the crowd until fr.189, drops suddenly to chin/throat level in the fraction of a second from fr.189-193, and stays at that level until he disappears behind the sign at fr.207.

(2) that Jackie, who had been looking to her left, turns sharply to her right and is fully facing JFK by fr.202 (she testified to the Warren Commission that when she turned toward him, his hands were at his throat), and



(3) that the three-frame blur which appears immediately following fr.189, in fr.190-192, resulted from Zapruder's startle reaction to a shot--which he testified to the Warren Commission he believed came from behind him on the Grassy Knoll.

Fourteen years later the HSCA panel used these same basic criteria, JFK'S abrupt hand-drop, Jackie's sudden turn toward him, and the blurring of the film in fr.190-192, in determining that JFK was hit by fr.190;<sup>1</sup> adding the observation that immediately after fr.190, his head, which was facing right, turns sharply to his left (toward the front). They say,

"The President's right hand freezes in the middle of a waving motion, followed by a rapid leftward movement of his head"<sup>2</sup>, and a

"...pronounced series of jiggles or blurs on the Zapruder film, one during frames 189-197, a time when other visual evidence suggests that President Kennedy was first shot...may reasonably be attributed to the photographer's startle reaction to the sound of gunshots",<sup>3, 4</sup> (underlines added)

The panel also concluded that Governor Connally, having been struck by this same fr.189 hit, still shows no visible reaction as he disappears behind the sign in fr.207, and does so only after emerging again in fr.224. I am confident that they are wrong, and that my own conclusion, that he was first hit significantly later, immediately prior to fr.238, remains correct. But putting that aside for the moment, how does the HSCA reconcile its own photo experts' observations of a two-second delay between the reactions of JFK and Connally, with their conclusion that they were hit by the same bullet? They do this by adopting the Warren Commission's practice, familiar to all who have checked its conclusions against its own evidence in the Volumes, of simply stating a conclusion in their Report that their own evidence fails to adequately support, and frequently contradicts. In its Report the HSCA says,

"Taken together with other evidence, the photographic and acoustical evidence led the Committee to conclude that President Kennedy and Governor Connally were struck by one bullet at approximately Zapruder fr.190...."<sup>5</sup>



But the Photo Panel itself, while implicitly indicating that JFK and Connally were hit by a single bullet, is willing to state explicitly only that

"By a vote of 15 to 1, [Cyril Wecht dissenting], the Panel determined that the relative alignment of President Kennedy and Governor Connally in the limousine was consistent with the single-bullet theory".<sup>6</sup>(underlines added)

However, the Panel clearly understood that great difficulties would ensue from a finding that the single-bullet theory was untenable. Therefore, they attempt to narrow the time gap between the observed reactions by fuzzy language, dubious observations, and flimsily supported conclusions. Since they agreed that the observed phenomena clearly establish that JFK was hit by fr.190, their attempt to force the widely separated reactions to fit the single-bullet theory is focused on Connally. To this end, they first say,

"Governor Connally first showed a reaction to some severe external stimulus by Zapruder fr.224...He appears to be frowning, and there is a distinct stiffening of his shoulders and upper trunk. Then there is a radical change in his facial expression, and rapid changes begin to occur in the orientation of his head." <sup>7</sup>

(Actually, these observations do not at all necessarily indicate that Connally was already hit, but can just as easily indicate a normal startle reaction to the sound of a shot that did not hit him--which in fact is consistent with his own frequently stated belief.) The Panel goes on to say,

"In the subsequent frames, Kennedy and Connally appear to show simultaneous reaction-type movements. There is less than a three-frame (0.16 second) delay in their movements".<sup>8</sup> (underlines added)

Note that the the Panel now seemingly wishes to obfuscate its own observations of a thirty-five frame gap between the Kennedy and Connally reactions (189-224) by reducing it to " ...less than a three-frame delay...", and by employing tricky and vague language concerning the victims' "...subsequent...simultaneous reaction-type movements". They fail to specify, so others can check, precisely to which movements they are now applying a three-frame delay. Such "subsequent" movements are clearly less useful in trying to pinpoint the moment of impact than the initial movements immediately following a hit.

By the next page, the panel is ready to move on to its prime task of resuscitating the single bullet-theory by attempting to demonstrate that the two victims were properly aligned; and by now has linguistically all but eliminated the reaction time differential:

"Having noted the virtually simultaneous reactions displayed by Kennedy and Connally, the panel proceeded to consider whether the two men's relative alignment...was consistent with the single-bullet theory".<sup>9</sup> (underlines added)

While basing its erroneous conclusion that Connally was struck by fr.190 on extremely flimsy photographic evidence, the Panel fails to take note of and confront the logical implications of very strong evidence in the film that (a) he was not yet hit in fr.232, and (b) he was hit immediately prior to fr.238.

(a) fr.232: This is a critically important frame. By itself, without requiring support from the extensive and varied other available evidence,<sup>10</sup> it demolishes the single-bullet theory, and with it the established myth of the lone assassin. In fr.232 we see Kennedy in obvious distress, his hands in front of his throat and chest, his arms and elbows flung upward and forward. (In my view, as will be explained later, he is reacting to a second hit, this one in the back at fr.225, after receiving a throat-entry wound approximately two seconds before, at fr.189; the Photo Panel's view being he has by this point been hit only once, at fr.189.)

The crucial question before us is, has Connally, also, already been hit, as the HSCA says? In this frame, 232, having turned from looking to his right as he emerges from behind the sign in fr.222, he is facing forward and is showing no signs of physical distress. His right elbow is down, hidden from us by the side of the car. But we can see his forearm, white sleeve cuff, and wrist in a straight-line ascending attitude, so that his right hand is in front at shoulder height, in a knuckles up, fingers forward and down position. He is holding the brim of his hat, most of which is down out of camera view. The Warren Commission/HSCA position is that by this time all the Governor's wounds have already been inflicted; not only the piercing of his chest, which smashed his fifth right rib, but also the multiple fracturing of his right wrist, and the simultaneous severing of nerves and tendons controlling his right hand and fingers. But it is obvious that he could not be holding his hand as he is in fr.232, in an ascending straight-line knuckles-up position, fingers still gripping his hat brim, had he already sustained the injuries described; whether approximately one second

before as the Warren Commission says, or two-and-one-half seconds earlier as the HSCA says. Nor could he have raised his wrist and hand to this position, continuing to hold his hat, had his wrist already been shattered.

Comparing Connally's appearance in fr.232 with that 1-1/2-seconds later in fr.258, by which time he indisputably has been hit, his right arm is still held in an ascending attitude, but his wrist and hand are now seen dangling limply, as common sense tells us would be the case immediately after having been pierced and shattered. No wonder the Committee showed no desire, any more than the Warren Commission before it, to call attention to fr.232.

(b) fr.238: While fr.232 demolishes the single bullet theory by providing powerful visual evidence that Connally had not yet been hit, fr.238 accomplishes the same task by pinpointing the moment when he was hit. From a forward facing position in fr.232, Connally starts to turn his head and body to his right. By fr.237 he is well around in his turn, his chest perpendicular to the camera (which is to the right front of the limousine), his head not quite that far around.

The critical observation here is the movement of his right shoulder. Beginning in fr.232, his shoulder describes a continuous motion, maintaining a relatively straight-line appearance, with only slight frame-to-frame changes as he turns to his right. But this appearance is suddenly and dramatically changed in the 1/18-second between fr.237-238<sup>11</sup>.

We see in fr.238, that his shoulder is sharply lower than in fr.237 (Jackie's red roses, which were virtually hidden in previous frames by Connally's right shoulder, are now suddenly much more visible in fr.238-239). And, as is plainly evident in fr.238-242, Connally's body has been instantly halted in mid turn, and his head--which was lagging somewhat behind in the turning motion--now snaps rapidly around further to his right.

In the circumstances, the sharp and virtually instantaneous shoulder drop between fr.237-238 can only be reasonably attributed to the impact of a bullet in his back at that moment, which drove his shoulder down and forward (toward Zapruder's camera.)<sup>12</sup>

While failing to publicly confront specifically this clear and dramatic evidence, defenders of the Warren Commission/HSCA single bullet theory invariably attribute the acknowledged difference between JFK's and Connally's reaction times to a delayed reaction by Connally. By thus appealing to the common experience that many people have

had--of having sustained a blow or injury to which they were conscious of pain only later--the defenders deliberately try to obfuscate the obvious, that there are often two kinds of reactions associated with an injury; the motion imparted to the body by the force of the blow, and the pain resulting from the injury. While the latter may well be delayed, the former is instantaneous. There can be no reasonable question that what we are seeing in fr.237-238 is the immediate physical reaction to the impact of the bullet, and not the delayed reaction to pain from a hit significantly earlier.

Also, beginning in fr.237-238, Connally's cheeks are noticeably puffed out, as one might experience while coughing severely; in this instance, the virtually certain result of air being forced from his right lung as a consequence of the slug tearing through his chest.<sup>13</sup>

If any doubt remained for objective but skeptical observers as to the meaning of the dramatic drop of Connally's shoulder at fr.237-238 coinciding with his sudden halt in mid-turn, that doubt should be entirely removed by the obvious puffing of his cheeks in the immediately subsequent frames.

The HSCA photo panel also managed to avoid noticing the sudden motions by JFK immediately following fr.225, which lead me to conclude he was struck for the second time at that point. My observations are as follows:

In fr.225, JFK is clearly in distress, reacting to the fr.189 hit two seconds earlier. His face is contorted and his hands are in front of his chest, right hand above his left. Then there is a four-frame blur at fr.226-229, Kennedy's body is jolted sharply forward, and the position of his hands and elbows--particularly his elbows--change dramatically, as they are flung upward and forward. The force and speed of these movements of his arms and elbows are quite startling when one compares fr.226, where they are first discernible, to fr.232 just 1/3-second later. I believe the short sharp forward movement of JFK's body and the extremely rapid upward and forward thrust of his elbows, accompanied by the blurred frames (again, almost certainly caused by Zapruder's startle reaction), are most logically explained as resulting from the impact of a shot to Kennedy's back at fr.225.

It is instructive to examine how the HSCA's photo panel dealt with the evidence of these additional separate hits, in fr.225 and fr.238. Since granting credence to either of these would immediately nullify the Committee's fixed idea that only two shots, both from the TSBD, struck

the victims, the evasiveness evident in their method is understandable. However, their analysis discloses that they were not entirely unaware of such evidence. Let's look at the two cases separately:

fr.225: I have stated my own conclusion that JFK was struck, for the second time, in the back at fr.225. I based this on my observation that beginning in fr.226, his body moved sharply forward, and his arms and elbows are flung upward and forward. The Panel completely ignores these movements, readily visible to any layman who looks at the individual frames. Together with these rapid movements I also noted a four-frame blur at fr.226-229, which I believed was Zapruder's startle reaction to this shot.

In conducting its blur analysis, the HSCA used the earlier work of the eminent Berkeley physicist, Dr. Luis Alvarez,<sup>14</sup> and that of two members of its photo panel, W. K. Hartmann and Frank Scott. In addition to blur episodes immediately following fr.189 and fr.313, which they attributed to shots, all three experts also detected the blur at fr.226-229<sup>15</sup> While Alvarez in his 1967 study for CBS concluded this blur episode represented a hit,<sup>16</sup> the HSCA dared not pursue this possibility, for they had already expended, at fr.189, one of the two hits to which they were limited by their theory, and the head hit<sup>17</sup> was still to come. Therefore, while ignoring JFK's sudden and dramatic movements following fr.225, they say,

"It is difficult to determine with certainty whether... [this] represents an additional shot. [This] blur episode, detected by all three analysts occurs at fr.220-228 just before movements of Governor Connally in which his cheeks suddenly puff out and his face contorts in a grimace, followed by two apparent outcries in which his mouth opens wide in what appears to be a shout of pain." (underlines added)<sup>18</sup>

Actually, the graphs of the Committee's own experts, Hartmann and Scott, are significantly more specific, clearly indicating they placed the blur episode not at "fr.220-228", but at fr.225-228, with a peak intensity at fr.227<sup>19</sup>. (Alvarez' graph alone shows a wider blur episode, possibly justifying the "fr.220-228" interpretation, but in the 1967 CBS documentary he, too, cites fr.227 as the key frame in this series.)

I believe this purposeful imprecision is a deliberate attempt by the HSCA to fuzz their own experts' findings, and to divert attention away from the fact that the blur actually coincides with the rapid Kennedy movements following fr.225, and thereby avoid confronting what these coinciding phenomena strongly imply.

fr.238: In the above quoted passage, the HSCA Panel is triply deceptive in its comments about Connally, and attempts to mislead by mis-statements of omission and commission. First, while mentioning his cheek puff, they carefully avoided any consideration of its most logical and probable cause--the instantaneous expulsion of air from his punctured and collapsing right lung. This clearly would be an immediate reaction to the hit, not a delayed one. Second, while the experts accurately mark the cheek puff on their graphs at approximately fr.236-238<sup>20</sup>, in the passage quoted the only frames mentioned are fr.220-228. While apparently inexcusably sloppy, this is perfectly understandable behavior considering the HSCA's determination to avoid the land mine of a separate Connally hit, at fr.237. And of course, concerning his shoulder drop at fr.238, they pretend to be completely oblivious; although it is easily observable in a few moments' examination of the individual frames, had been repeatedly and prominently mentioned in assassination literature for at least a decade, and was specifically called to the attention of the HSCA in my letter to them prior to their study.<sup>21</sup>

Their recorded behavior indicates they were aware that had they put together in their analysis the observation of Connally's fr.237-238 shoulder drop--which they failed to mention--with his cheek puff at that same instant--which they noted but refused to explore--and had they drawn the most reasonable and logical conclusion therefrom, the single bullet theory would have instantly collapsed. Instead, by their studied and deliberate vagueness, they attempt to telescope and compress all the observable movements of both JFK and Connally from fr.189 on (where they conclude correctly that Kennedy was first struck), back to that point. This clearly implies their position to be not only that Kennedy's movements at fr.186-189 were caused by the hit at that instant, but also his sudden arm and elbow thrust two seconds later at fr.226-232, and Connally's dramatic movements still later, following fr.237, were all caused by the same JFK hit at fr.189.

This proposition, vital as it is to the Warren Commission/HSCA single bullet theory, can be maintained only by ignoring the clear evidence of the Zapruder film.

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In summary, the HSCA correctly concluded that JFK was first struck by fr.190, (at a time when he was virtually invisible from the TSBD window.)<sup>22</sup> They thereby differed with the Warren Commission conclusion that he was first hit in the period between fr.210-225. But they agreed with the Commission's other erroneous conclusion that both Kennedy and Connally were struck by a single bullet. They did this by drawing unwarranted conclusions from their photo panel's assessment of Connally's appearance in fr.223-225; and by ignoring both the much stronger evidence in fr.232 that he was not yet hit, and the overwhelming evidence in fr.237-238 that he was hit by a separate shot at that time. They also avoided any serious consideration of the evidence pointing toward the likelihood that Kennedy was hit, for the second time, at fr.225.

Its valiant efforts notwithstanding, the HSCA has failed to resuscitate the single-bullet theory. Despite its veneer of scientific objectivity, its conclusions simply do not survive close scrutiny. The theory is, as it has been from the first, not only unsupported by the Warren Commission/HSCA's own evidence, especially the Zapruder film, but decisively contradicted by it. Despite specious and self serving efforts to claim that the question is not of crucial importance, the clear implication which arises from this theory's demonstrable failure was most succinctly stated almost three decades ago by Warren Commission attorney Norman Redlich, who said, "To say they were hit by separate bullets is synonymous with saying there were two assassins."<sup>23 24</sup>

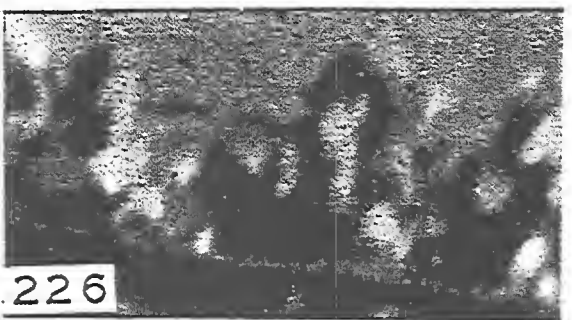
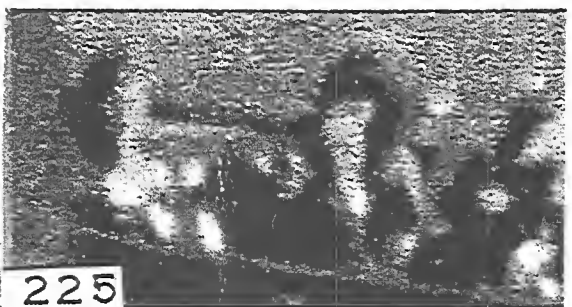
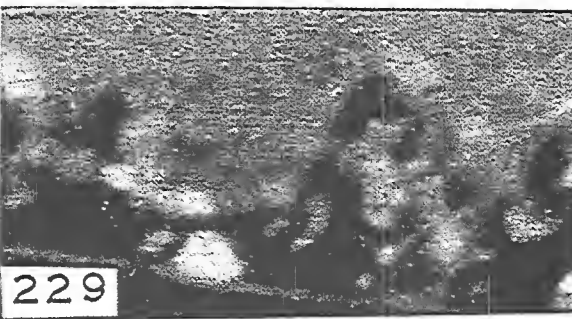
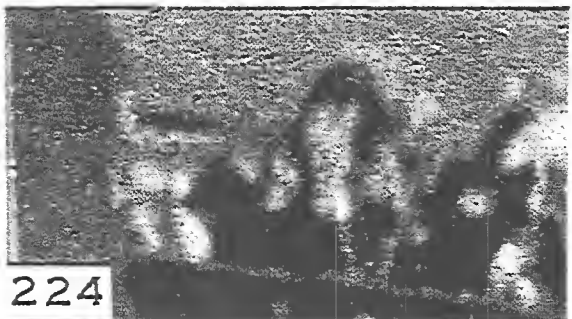
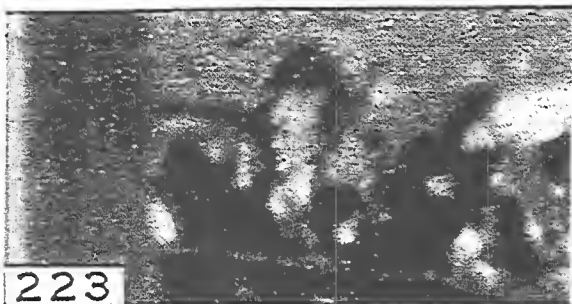
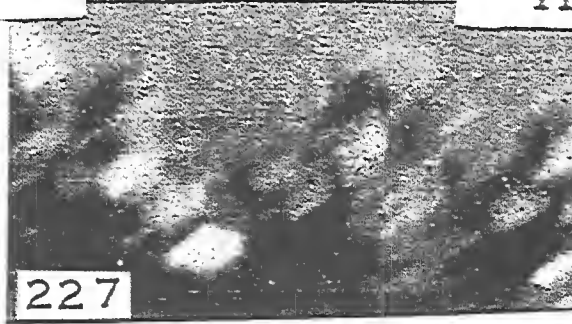
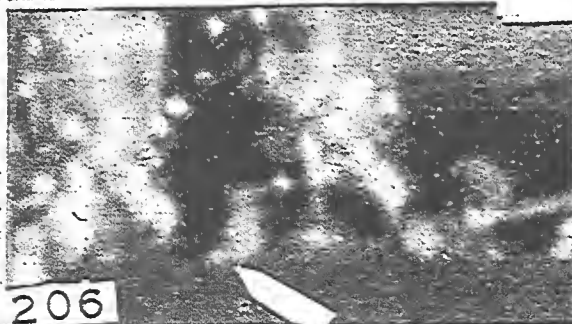
The visual evidence in the Zapruder film proves the enduring validity of his statement.

\* \* \* \* \*



## Zapruder Frames

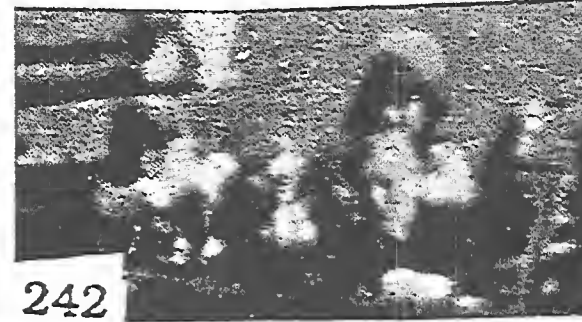
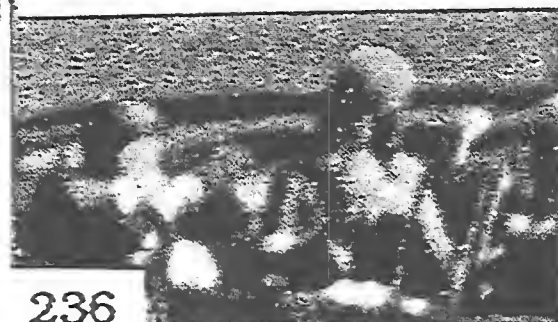
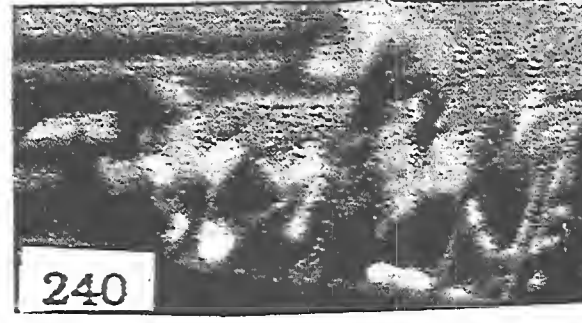
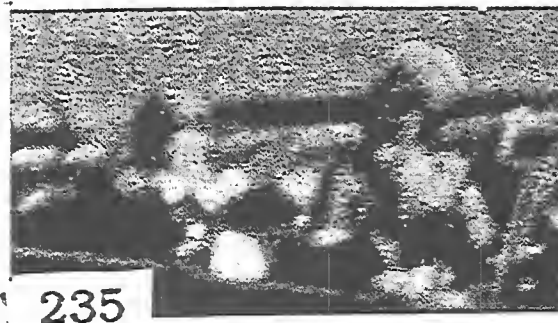
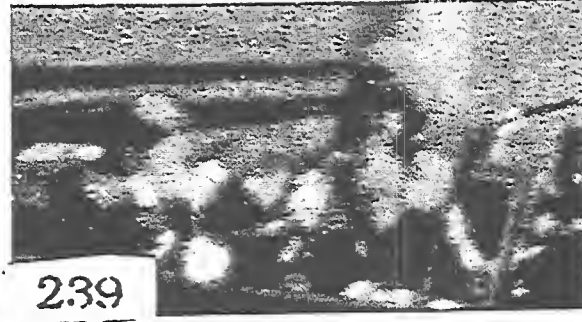
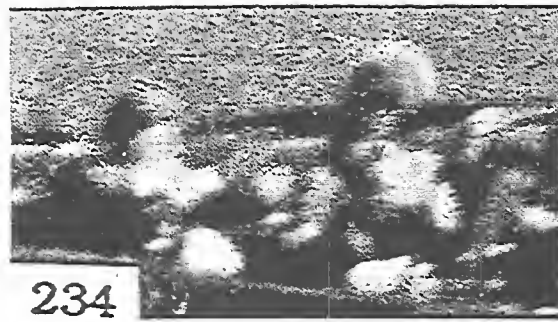
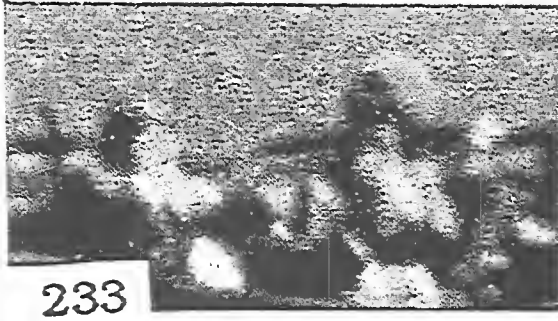
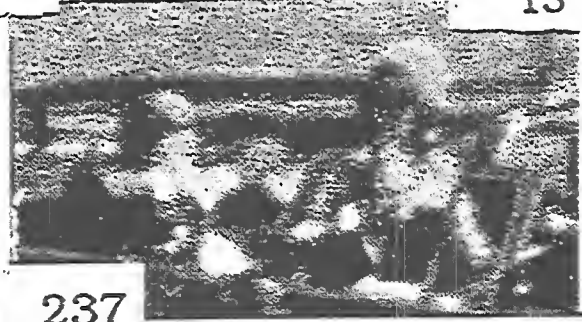
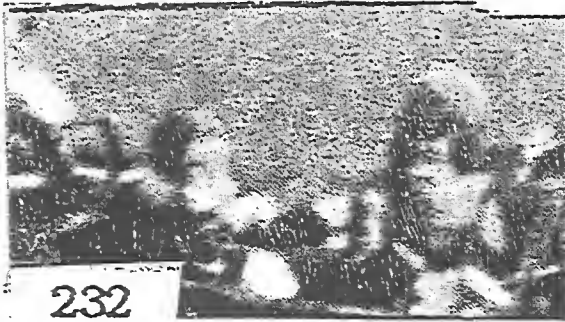
(Passenger Compartment)



fr.232: Connally not yet hit. Note his right hand and wrist in ascending straight-line attitude, at shoulder level, knuckles up, fingers forward and down, holding brim of hat. Position indicates his wrist not yet struck.

fr.233-237: Connally turns to his right. Note his right shoulder.

fr.238-242: Connally's turn is interrupted at fr.238. His right shoulder is driven sharply downward as immediate--not delayed--reaction to hit in back (Jackie's red roses are suddenly more visible). In fr.237-240 his cheeks puff out as air is expelled from punctured right lung.



fr.226: JFK's arms and elbows start upward and forward thrust as result of probable shot in back at fr.225.

fr.232: Reacting to back hit, JFK's arms and elbows in dramatically changed position in 1/3-second since fr.226.

Connally not yet hit. Right hand and wrist in ascending straight-line attitude. Position indicates wrist not yet struck.

fr.258: Connally obviously reacting to hit which struck him one second earlier at 237-238. His hand dangles limply forward and down from the wrist (dark area on right hand is shadow from chrome bar of windshield).

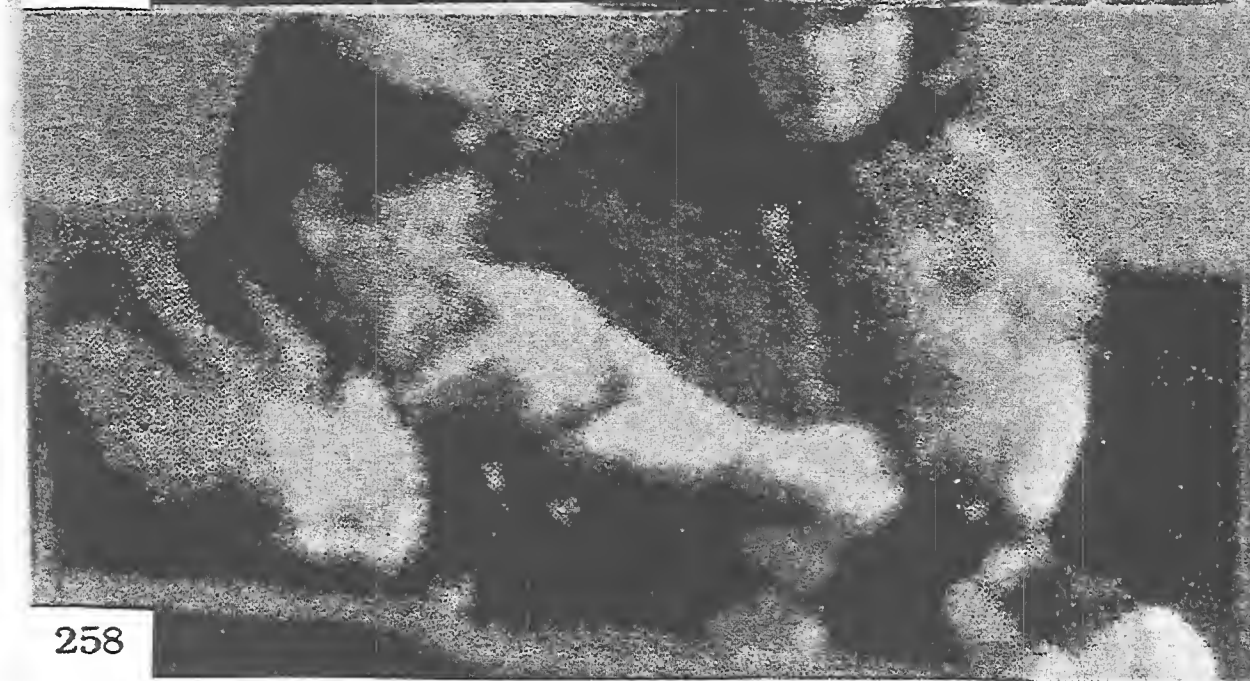




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232



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Sources

and

Notes



## Sources and Notes

1. The HSCA does not mention publicly the serious problems created by its correct conclusion of a JFK fr.189 hit for its theory that all hits came from above and behind--the TSBD. The FBI's finding soon after the assassination that the foliage and branches of a large tree obstructed the view from the TSBD window during fr.166-210, except for a virtually instantaneous 1/18-second opening at fr.186, has never been seriously challenged. This FBI finding makes it extremely unlikely that the fr.189 hit came from the TSBD window.

To believe that it did one must accept that the sixth-floor assassin, having failed to fire when he had a clear shot prior to fr.166 (not to mention the even better opportunity still earlier when the limousine was moving slowly north on Houston Street directly toward the TSBD), and too impatient to wait one second more until fr.210 when he would again have a clear shot, instead chose to fire while his target was behind the tree, and managed somehow to sight JFK in his telescopic crosshairs and squeeze off an accurate shot--either firing virtually blind, or during the 1/18-second opening at fr.186--a time span shorter than the 1/6-second physiologically required for an image to register in the human eye.

2. HSCA Report, p.46

3. HSCA Vol.VI, p.27-28

4. Doesn't the HSCA's correct conclusion of a JFK hit at fr.189, coupled with the compelling Zapruder evidence--which they failed to confront--of a separate hit to Connally forty-eight frames later at fr.237-238, render irrelevant the 42-frame time-constraint (the FBI's determination that the minimum firing time between shots with the Mannlicher-Carcano was 2.3 seconds, or forty-two frames of Zapruder film at 18.3 frames per second)? Unfortunately for the Committee's conclusions, almost certainly not; for there is strong evidence in the film that between the JFK hit at fr.189 and the Connally hit at fr. 237, Kennedy was struck a second time, probably in the back, at approximately fr.225, just as he emerges from behind the sign. This is only thirty-six frames after he was first hit at fr.189, and twelve frames prior to the Connally hit at fr.237; in both cases shots too closely spaced to have been fired by the lone TSBD assassin. (I discuss this in detail on p. 6.)

5. HSCA, Report, p.47

6. HSCA VI, p.16-17

7. *ibid.*

8. *ibid.*

9. HSCA VI, p.18

10. While the focus of this essay, as a means of disproving the single bullet theory, is the Zapruder film, the other most potent item of evidence attesting to the theory's vulnerability is the long infamous "magic bullet" itself. I examined various aspects of this vital piece of evidence in detail in my 1966 essay, The Bastard Bullet: A Search for Legitimacy for Commission Exhibit 399, and came to the conclusion that it was planted at Parkland Hospital in order to incriminate Oswald; and in fact had not been fired at anyone. Since writing it, a number of additional items of pertinent information have surfaced supporting this

### Sources and Notes (cont.)

conclusion. Among them are the statements by Dr. Joseph Dolce in a taped interview for the video, Reasonable Doubt: The Single Bullet Theory and the Assassination of John F. Kennedy (C.S. Films, 1988).

Dr. Dolce was the chief consultant in wound ballistics for the U.S. Army, who supervised tests for the Warren Commission to determine if bullets of the same type as C.E.399 could have inflicted all the wounds attributed to it by the Commission (and years later, by the HSCA), and emerge in as near-pristine condition as C.E. 399. He says,

"... no, it could not have caused all the wounds. Because our experiments showed beyond any doubt that merely shooting the wrist deformed the bullet drastically. And yet this bullet came out as almost a perfectly normal pristine bullet . . . they gave us the original rifle, the Mannlicher-Carcano, plus one-hundred bullets, 6.5 millimeter, and we went and shot the cadaver wrists as I've just mentioned, and in every instance the front or the tip of the bullet was smashed. It's impossible for a bullet to strike a bone, even at low velocity, and still come with a perfectly normal tip. The tip of this bullet was absolutely not deformed in no instance whatsoever, and in no amount. Under no circumstances do I feel that this bullet could hit the wrist and still not be deformed. We proved that by experiments. (emphasis by Dr. Dolce in interview)

Only those unfamiliar with the Warren Commission's typical methods of operation may find it surprising that (1) they--and the HSCA after it--failed to interview Dr. Joseph Dolce, and (2) while making no mention of the results of the experiments he speaks of, they claimed the tests supported the single bullet theory, with C.E.399 as its agent.

11. Hypotheses Re: the Zapruder Film, R. Marcus, 1965, (unpublished)
12. In 1968, Don Olson's study of the Zapruder film convinced him that Connally was actually hit at fr.233-234, instead of fr.237, as I had believed. He suggests that what we are seeing in fr.237-238 is the drop of the right shoulder of Connally's jacket, which as a loose fitting garment, lagged a split-second behind as his shoulder is driven down from under it.
13. Connally's cheek puff was first noticed by Josiah Thompson, Six Seconds in Dallas, pub. B. Geis, 1967.
14. Transcript, CBS News Inquiry, The Warren Report, Part 1, broadcast June 25, 1967.
15. graph, HSCA VI, p.26
16. I agreed with Dr. Alvarez' analysis of blurs, as presented in the 1967 CBS documentary, which indicated shots at approximately fr.186, fr.225, and the obvious one at fr.313. However, since my own analysis (based partially on the blurs, but primarily on the movements of the victims) posited additional hits at fr.237 (Connally) and fr.314 (second JFK head hit--see note 17), I wrote to him telling him of my findings, and asked for more details about his.

### Sources and Notes (cont.)

In the course of extensive correspondence during 1967 and 1968, he admitted that his blur method did not preclude additional shots at the points I indicated, because,

"I am quite convinced that one cannot use this method to look at shots that come closer than 1 second, since then the trains [of blur episodes] would overlap, and could not be resolved."  
(emphasis added)

Since the two additional shots I found both fell within the one-second limitation he himself had specified for his theory, the results reached by our two methods were not incompatible; for his theory, while fixing three as the minimum number of shots, was clearly incapable of determining the maximum number.

Yet CBS in its documentary had based its conclusion of no more than three shots largely on Alvarez' work. Either he had failed to inform CBS that due to the one-second limitation he himself specified, his theory could not set the maximum number of shots; or he did inform them, and they failed, in turn, to inform the public. Of course, had they done so, it would have seriously undermined their strenuous efforts in support of the Warren Commission.

Despite my repeated subsequent attempts in correspondence with Alvarez to learn whether or not he had so informed CBS, he refused to answer the question. (Alvarez letters to Marcus, May 10 and June 8, 1968; Marcus to Alvarez, May 16, May 31, and June 15, 1968.)

17. After completing my Zapruder paper in February 1965, Hypotheses Re: The Zapruder Film, in which I concluded that JFK's head was struck (only) from the front, at fr.312, further study lead me to believe that the explosion of his head beginning in fr.313 was the result not of a single shot, but of two; the first from the rear at fr.312, the second from the right front at fr.313-314 (I first wrote publicly of this in my letter to Ramparts Magazine, published in March, 1967). I came to this conclusion after re-evaluating the following factors:

(1) His head does not describe a continuous motion, but two distinct motions: the first from fr.312-313, a short, sharp, forward and downward movement; and the second, the familiar slamming backward and to his left, in which his head moves rapidly through an up-and-over rearward arc, until it contacts the seat back.

(2) While it seemed clear to me that the force which threw Kennedy's head and body to his left rear had to come from the right front, the large wound extending forward of his right ear, which first appears in fr.314, seemed more consistent with an exit wound, from the rear, than an entry from the front.

(3) Although brain matter and large fragments of bone were hurled backward, a considerable amount of matter was thrown forward, onto the Connallys. (A segment of bone was recovered near the south curb

### Sources and Notes (cont.)

of Elm Street, at a location consistent with a shot from the right front; and there are reasonable indications that Jackie was reaching for another skull fragment as she climbed out onto the rear deck.)

The multi-directional paths of bone and brain matter, considered with factors in (1) and (2), strongly suggested to me that two almost simultaneous head hits, first from the rear, then from the right front, had occurred.

Subsequent disclosure by numerous Parkland trauma room personnel that, contrary to the official line, JFK had a large wound in the back of his head--which they identified over the years to various interviewers as an exit wound in the right occipital-parietal area (lower right-rear area of the skull), strengthened my conviction that he indeed had been struck in the head twice.

In November 1977 and January 1978, the Parkland doctors were questioned about the head wounds by HSCA staff. Dr. James Carrico said,

"The head wound was 2-1/2 X 3 inches, ragged, had blood and hair all around it, located in the part of the parietal occipital region. That would be above and posterior to the ear, almost from the crown of the head, there was brain tissue showing through".

Dr. Marlon Jenkins, an anesthesiologist, was positioned at the head of the table so he had one of the closest views of the head wound. He noted that a portion of the cerebellum (lower rear brain) was hanging out from a hole in the right rear of the head.

Dr. Malcolm Perry said,

"...And I looked at the head wound briefly by leaning over the table and noticed that the parietal occipital head wound was largely evulsive and there was visible brain tissue...and some cerebellum seen..." (HSCA Vol. VII, p.278, 287, 302).

The fact that a number of Parkland doctors, years later and under obvious government-inspired pressure, retracted their original positions thereby reversing their contradiction of the official line, did not convince me that the facts had changed.

Dr. Charles Crenshaw's book, published in 1992, JFK: Conspiracy of Silence, is a valuable record not only of his graphic recollection of the appearance and location of Kennedy's wounds, but also of the kinds of pressures the Parkland doctors were under to conform to the official version.

18. HSCA VI, p.29

19. graph, HSCA VI, p.26

20. *ibid.*

21. Letter, R. Marcus to HSCA, Feb. 12, 1977.

22. See note 1.

23. Interviewed by Edward Jay Epstein, The Warren Commission and the Establishment of Truth, Viking Press, 1966.

### Sources and Notes (cont.)

24. Why did the HSCA, while fundamentally differing from the Warren Commission by concluding that the assassination did indeed result from a conspiracy, nevertheless insist on clinging to the single-bullet theory? I believe the answer lies in the type of conspiracy they were willing to find and accept--a conspiracy planned and carried out by the Mafia, aided perhaps by some anti-Castro Cubans, but excluding any involvement by U.S. government agents; whether acting independently or at the direction of their agencies.

The HSCA's finding of conspiracy was in fact a full vindication of the most basic charge of the critics; that the assassination was the result of a plot, and not the work of a single individual. Therefore, it amounted to an historic refutation of the Warren Commission's conclusion, and of its nearly unanimous major-media supporters.

By any objective measure, this should have been headline news. But in fact, in terms of any sustained interest, the media barely took notice. Of that portion of our population who were adults when the HSCA issued its Report early in 1979, only an insignificantly small fraction--even among highly educated and presumably sophisticated people--are even aware, to this day, that a committee of Congress, after a two-year investigation, came to the conclusion that the assassination of John F. Kennedy was the result of a conspiracy--albeit the limited-hangout conclusion of a Mafia-inspired conspiracy.

Over the years, this has become the favored fall-back position of those who felt, while rejecting evidence of government-connected conspiracy, that they could not defend the Warren Commission's one-lone-nut-killed-another-lone-nut fantasy. During the period of the 1980's and 1990's, a number of books appeared adopting this HSCA-promulgated Mafia-did-it line; and a PBS FRONTLINE television documentary was broadcast in November, 1992, narrated by Jack Newfield, propagating the same view.

But still, while concluding there had been a conspiracy, and acknowledging that at least one shot---which they insist missed---came from the grassy knoll, the HSCA found it necessary to embrace the overwhelmingly vulnerable and long discredited single-bullet theory; and while correctly concluding that JFK was first struck just prior to fr.189, instead of fr.210-225 as the Warren Commission said, they nevertheless fully adopted the hit-and-wound pattern described by the Commission.

I believe they did so because to do otherwise would make it much more difficult for them to maintain their position of no U.S. government-connected involvement. They clearly believed that to abandon the single-bullet theory would have forced them to seriously confront the many significant questions tending to undermine the validity of official positions on such matters as the autopsy report; the number of bullets and fragments removed from the bodies, or found elsewhere; the number, timing, and direction of shots; the alteration and obfuscation of wounds; and the bona fides of the autopsy photos and X-rays.

Objective study of these questions would make it all but impossible to exclude government-connected complicity; certainly

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immediately after the fact, and therefore, to greatly increase the probability of before-the-fact culpability as well. Upon careful examination, it seems clear that given the evidence publicly available, once the Warren Commission seized upon the single-bullet theory as a means--it hoped--of resolving the problems posed for its lone-assassin scenario by the physical evidence (bullets, wounds, and the Zapruder film), the theory became indispensable to the maintenance of this scenario (although they sometimes denied this fact). Consideration of these factors eventually forced the theory's acceptance by the HSCA, whose conclusions, also, specified that the victims were struck by two hits only, both from the TSBD, even while acknowledging an additional (missed) shot from the knoll.

It was early in 1964 that Warren Commission counsel Norman Redlich made the statement, while upholding the single-bullet theory, that;

"To say they were hit by separate bullets is synonymous with saying there were two assassins."

In view of all the circumstances involved in the matter, a logical corollary of the truth of Redlich's theorem would be;

To say they were hit by separate bullets is synonymous with saying there was a government-connected conspiracy.

## Comments by Leading Warren Commission/HSCA Critics:

"The first published work questioning the Single Bullet Theory was written by Raymond Marcus in 1966. The Bastard Bullet took its place beside Sylvia Meagher's Accessories After the Fact, Harold Weisberg's Whitewash, and Penn Jones, Jr.'s Forgive My Grief, becoming one of the primers for assassination researchers. Marcus has added another classic to the assassination literature: The HSCA, The Zapruder Film, and the Single Bullet Theory. Every serious student of the assassination of President Kennedy should study this essay".

**Mary M. Ferrell**

"All in all, Marcus' booklet is a valuable piece of work".

**Penn Jones, Jr.**

"A crucial aspect of the official contention by the Warren Commission and the HSCA is that one bullet transected the President's body and continued in its flight to cause all of Governor Connally's wounds. In this analysis by Raymond Marcus, one of the first and foremost of the first generation of critics, this specious contention has been definitively explored and exposed for the absurdity that it is. In a brief, concise study of the Zapruder film, Marcus has meticulously proved the impossibility of the Commission's and the HSCA's premise. This work is both important and scholarly and is imperative to the study of the President's murder."

**Maggie Field**

"Ray Marcus' autopsy on what in his fine earlier monograph he correctly called The Bastard Bullet exposes the phoniness of the attempt to resuscitate that single-bullet bastard by the House Committee. It is straightforward in simplifying the manufactured official complications and then disproving them. Those interested in the single-bullet theory should read this worthwhile monograph."

**Harold Weisberg**

"Knowledgeable WCR critics may not all concur with the precise scenario set forth by Raymond Marcus in his pictorial analysis of The HSCA, the Zapruder Film, and the Single-Bullet Theory. However, every serious student of the JFK assassination would most certainly agree that the author clearly and incisively proves that the President and Governor John Connally were hit by separate bullets. This illustrated booklet is an excellent example of the dramatic effectiveness of demonstrative evidence."

**Cyril H. Wecht, M.D., J.D.**

"Ray Marcus has done it again. In Marcus' classical book, The Bastard Bullet, his analysis of the Zapruder film and Commission Exhibit 399 punctured the Warren Commission's single-bullet myth. Now, in this new work, he asks us to peer with him again through the Zapruder camera lens. His analysis destroys the essential conclusion of the Report of the House Committee on Assassinations which sought to posit an assassination model which fit a Mafia-non-governmental conspiracy. Marcus' work compels the conclusion that elements of the United States government engineered the conspiracy. This fine piece deserves to be placed on your library shelf next to his brilliant The Bastard Bullet. Make no mistake; on the Zapruder film Marcus is the critics' critic."

**Vincent J. Salandria**