

Dr. R. A. J. Riddle, assistant professor of physics at the U of Calif at L A and a member of that university's Brain Research Institute, has studied the relevant frames of the Z film and stated to the authors what the film shows to the eye and mind of a trained observer:

Newton's second law of motion⁹ has remained inviolate for three centuries. Not even the advent of relativity and quantum mechanics have disturbed its validity. No physical phenomenon is known that fails to obey it. One of the most immediate consequences is the conservation of momentum; basically, this law says that an object hit by a projectile will be given a motion that has the same direction as that of the projectile. At a shooting gallery, for instance, the ducks fall away from the marksman, not toward him. Thus, if someone is shot, and the shot strikes bone, the general direction of recoil will be away from--not toward--the marksman (this assumes, of course, that there are no mitigating effects).^{9-A}

Let us now apply this knowledge to the assn of K as shown in frames 310-323 of the film taken by Z. The following facts are evident from observation and measurement of individual Z frames:

1. Jacqueline K does not move relative to the car.
2. The general direction of motion of K is backwards and to his left.^{9-B} His head velocity along the line of the car is about two feet per second.
3. The initial motion of his head is downward in frames 312-313.¹⁰
4. The effect of the shot is first seen in frame 313.
5. After frame 313 there is no forward motion relative to the car.

Point one, plus testimony from the hearings,¹¹ indicates that there is no acceleration of the car which would cause K to be thrown backwards. On the assumption that a neuromuscular reaction can be ruled out as the cause for this sudden violent backward motion upon impact of the P's head with the bullet, any motion of the body would be governed by the laws of physics, which govern the collision between any two objects.

The motion of K's body in frames 313-323 is totally inconsistent with the impact of a bullet from above and behind.¹² Thus, the only reasonable conclusion consistent with the laws of physics is that the bullet was fired from a position forward and to the right of the P.

It is disturbing that this conclusion contradicts the findings of the WC, but intellectual honesty compels me to offer the above opinion.¹³

Neither the WC nor anyone else, however august, can repeal the law of the conservation of momentum.

FOOTNOTES

9. The rate of change of momentum is proportional to the impressed force, and is in the direction in which the force acts. (Note by Dr. Riddle)

9-A. We must be careful how we apply these principles. It is only in cases where the impact is with bone, i.e., a rigid part of the body, that a definite statement of the resulting motion can be made. This is true of the present case, but not, for example, of a hit in the stomach. (Note by Dr. Riddle)

9-B. J. Edgar Hoover has acknowledged that two of these film frames, 314 and 315, were transposed in publication in Volume XVIII. (Note by Dr. Riddle)

10. The initial motion of the head (frames 312-313) is consistent with a bullet fired from an elevation of about 25 degrees or more from the direction we have postulated, since this would cause a turning motion about the neck in the direction observed. (Note by Dr. Riddle)

11. (Cites testimony of Mrs. Connally from WR 50, and Clint Hill 2H 141, on the sudden acceleration of the car AFTER the 313 shot. Also cites Shaneyfelt 15H 699 and concludes that the testimony of Hill and Sh, taken together, clearly establishes that the car did not accelerate until several seconds after the fatal head shot. Note by Dr. Riddle).

12. Even if the bullet impacted in such a way as to cause a turning motion of the head, we would expect to see some forward motion before the head is completely turned (see footnote 9); we see only a backward motion. (Note by Dr Riddle)

13. R.A.J. Riddle, private study conducted for Ramparts; previously unpublished.