

NOTE: SOME REVISIONS IN THIS LETTER ARE NECESSARY:

BERNABEI COPY

#2

6 Oct 1970

Letter #2

for Sylvia Heaster from Bernabei

ARE NECESSARY:

① SPEED OF B9H CAMERA IS 48-FRAMES PER SECOND FOR "SLOW MOTION" SPEED. (THIS NEW DESIGNATION DOES NOT AFFECT THE OVERALL THRUST OF THE ARGUMENT)

Paul Hoch Berkeley

Dear Paul:

After re-reading both your memo and my recent letter to you, I note a remark in the letter which may appear to you erroneous, although I think that in fact it is correct.

At the middle of p. 5 of the letter I assert that the target-recoil which you achieved with melons was mild in comparison with the "recoil" of JFK's head and body. Referring to your memo (p. 5), where you say that the melons recoil at a rate of 6 feet per second, I realized that I should have properly delineated the basis of my assertion, not only because otherwise the assertion may seem to you unwarranted, but also because it points to what I think may be a very serious error in your calculations regarding the rate of speed at which JFK's head moved backward.

You calculate the rate of speed for melons on the basis of measurements derived from film taking 24 frames per second; you calculate the rate for JFK on the basis of measurements derived from film which supposedly was taking 18 frames per second. If Zapruder's camera were taking 18 frames, your comparison of the respective rates would be valid, for the speed of the camera does not determine the speed of the object being photographed. But what if Z's camera were taking 24 frames when it recorded the head movements? Would you not then have grossly underestimated the speed of JFK's head? And would you not have compared that underestimated rate with a correct rate for the melons? Alvarez's initial "back of the envelope" calculations, which you thought might explain the discrepancy showed a proper correspondence, might turn out to correspond not at all-- unless, of course, the components of those calculations were to suffer some sort of "accommodation".

My assertion on p. 5 of the letter is based on the belief that Z's camera was taking 24 frames per second when it photographed the head movements. I think, then, that the head and body were moving far faster than you suppose.

What warrant have we for supposing that Z's camera was taking 18 frames? None, really, except that 18 frames is one of the normal settings of the camera. Well, then, I suppose that we have equal warrant for believing that it was taking 24 frames, the other normal setting of the camera.

NEWCOMB SAYS HE EXAMINED THE MATTER OF CAMERA SPEED AND CONCLUDES IT WAS RUNNING ABOUT 18-FRAMES PER SEC.

(I HAVE NOT YET SEEN THE EVIDENCE BEARING ON THIS. MY IMPRESSIONS OF THE Z FILM REMAIN AS DESCRIBED IN THIS LETTER

about >

48? "slow"

"slow"

see Bernabei's comments

see statement
re speed
of Z's
camera

Although there is no evidence whatever which suggests that Z's camera was taking 18 frames, there are two bits of evidence, each of a different kind, which strongly indicate that the camera was taking 24 frames. Perhaps neither is indisputable in itself, but the two corroborate one another well enough to produce virtual certainty that the camera was taking 24 frames. With virtual certainty on one side, and no evidence whatever on the other side, I think a reasonable person might feel compelled to believe that the camera was taking 24 frames. The assertion that it was taking 18 frames is supported by nothing more than somebody's wish that it were so. Some support!

On the day of the assassination, or perhaps on the day after, Zapruder told a Secret Service interviewer that he was photographing at 24 frames per second. (You know the document that I refer to; Weisberg discusses it in PW, and Thompson presents it in the back of his book). I know that in his testimony, ~~many~~ months after the shooting, Zapruder said that he was not sure of the speed, but I think it is significant that his initial recollection, soon after the event, was that he was taking 24 frames. It is the more significant because the film itself seems fully to corroborate his belief.

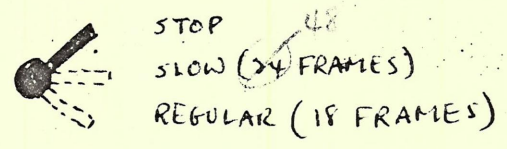
FBI - Barrett

Before I go farther, let me explain the operation of Z's Bell & Howell camera (although you may already know it), and then tell what I think happened. Subsequent to that, I'll tell why I think as I do. Roffman passed it to me in explanation of what appeared to me to be an anomaly in the film. I believe ^{Roffman} I learned it from, or worked it out with, Weisberg.

The speed of Z's camera is affected by the operation of a single switch which had three positions: stop; 24 frames per second (slow motion); and 18 frames per second (regular motion). The switch is operated by finger pressure. If you press the switch down from "stop" to the position just below "stop" and hold it there with steady downward pressure of the finger, the camera takes 24 frames; if you add pressure with your finger, you switch from 24 frames to the next lowest position, 18 frames. It is possible to go easily back and forth from one to the other, or all the way back to "stop", merely by varying the finger pressure. If you want to begin photographing at 18 frames, you simply depress hard enough so that you by-pass "24 frames" as you move the switch from "stop" to ~~24~~ "18 frames". Visualize the switch like this:

also position for taking one frame at a time

is this true?



+ a position for taking one frame at a time

The change is strikingly vivid when the film is viewed in motion, projected both at 18 frames per second and at (24) frames per second.

When projected at 18 frames, the movements of persons in the film seem abnormally slow for their circumstances-- here I am thinking chiefly of JFK lifting his arms upward, the motion of the man on the grass who drops his arms after applauding, and other movements. After the head wounding, a very sudden change occurs; the "aim" of the camera drops momentarily, and immediately persons seem to move with faster, more natural rhythms.

The change may be more evident when the film is projected at (24) frames per second. From the time when the film begins until the time when Mrs K arises from her seat, movements seem natural. But after the camera dips slightly down, things seem to move abnormally fast. The change is so rapid (instantaneous, really) that I cannot attribute it even to the sudden sense of haste and alarm that Mrs K must have felt at the time, for her movements as depicted in the film are unnatural, even for a person in a state of alarm. (I cannot accurately recall whether figures are visible in ~~the~~ the background of the film when the change occurs; I think not.)

A written account cannot adequately describe what the film shows, so I urge you to view it again, and to scrutinize it in light of the possibility that the speed of the camera changed from slow motion to normal motion just as Mrs K is rising from her seat.

Viewing the film projected at 18 frames per second, I see first slow motion, then normal motion; at (24) frames per second, I see first normal motion, then fast motion. This was my first impression when I first saw the film, and it persists.

The thought keeps recurring to me that your initial calculations (those that seemed so strongly to support the "target-recoil theory"-- if I may be permitted unimaginatively to coin a phrase) not merely are vitiated by the evidence indicating that the camera was taking (24) frames per second; the calculations seem, don't they, strongly to suggest (if not actually to prove) that the "recoil" of JFK's head and body cannot be attributed to

✓ recoil?

target-

Aluminum disappears; thinks that the "slow" motion is natural.

It is, I believe, a logical and legitimate and often valuable scientific process to prove that something cannot be done. It seems that in seeking to prove one thing, you inadvertently proved the opposite. Well, that too often happens in science.

What does a scientist do when he proves the opposite of what he set out to prove? I don't ~~know~~ know scientists well, but I know many honest scholars, and I don't suppose that they behave very differently from scientists. They would ~~discuss~~ not only disclose that they failed to prove a hypothesis, but if the matter were important (You should see some of the stuff we academics regard as important!), they would seek to inform interested persons (There are not many in my scholarly discipline) that they discovered the opposite of what they first supposed.

But there are, of course, scholars who would somehow "accommodate" the evidence to the hypothesis. I don't know why they do this, but I do know that they do it. Some scholars are dreadful people, scoundrels. And they give scholarship a bad name.

I know well my way of writing, and I can tell by the increasingly facetious tone of this letter (which was not planned) that I am starting to feel really sound and solid in my belief that you are dead wrong in this whole undertaking; that you are worse than dead wrong; that you are contributing to the illicit undoing of an enormous amount of sound and exceedingly laborious work done by many good people over a period of many good years. I would be less bothered if I thought merely that you were undoing that work, but increasingly I feel that you are on the point of undoing it illicitly, without the least justification, and perhaps even with your growing suspicion that what you are about to do is illicit. I hope for your sake that you are harboring such suspicions, for otherwise you are lost-- not only lost, but unrecoverable.

If you correctly estimated all the other physical bases of your calculations, but grossly underestimated the rate at which JFK's head and body "recoil", then your results fully support what has, from the very beginning, been the fundamental argument which compells the belief that the last shot originated from the front:

the head (with the body) was too solid, too heavy, too swift to have been set in violent backward motion by any force other than a bullet delivered from the front. Your calculations prove that a 6.5 M-C bullet could not have generated sufficient force to cause that degree of recoil in that target.

Thanks.

If you are now thinking of going back to the drawing board, ask yourself whether or not you are "accommodating". And give yourself an honest answer. That may be the most difficult part of your undertaking, but it is, and has been from the very beginning, the most necessary.

I said that the movement of JFK's head and body was the first and the most fundamental evidence that the last shot was delivered from the front. It is by no means the only evidence, nor is it alone the most compelling evidence, although it can stand alone and still rest solid, as your calculations seem solidly to prove.

There is a ballistic feature which I think positively establishes that JFK was hit in the head from the front, a feature which cannot have been caused by any other means. I firmly believe that this feature is positive in itself, without reference to any other evidence. Even if it were not in itself positive, it would still be enormously powerful corroboration for other evidence.

I'll discuss it in my next letter.

Still,

Dick

Dick Bernabei

cc. *Weisberg*
Roffman
Schoener
Newcomb