

for Sylvia Reagan
from Bernabei

BERNAEI
COPY

4 October 1970 (#1)

Letter # 1

Paul Hoch
Berkeley

Dear Paul:

Thanks for sending your recent memo concerning JFK's movements after Z312. If I am correct in supposing that in your tests you used ammunition corresponding to normal factory loads of 150-grain 30/06's, then I am afraid that what I have to say will cause you disappointment, for I strongly suspect that your results are invalid in so far they apply to the assassination of JFK.

The reason why I cannot be certain is that you provide insufficient information about the ammunition that you used. If you used what I believe you used, then your tests are indeed invalid.

You say that you used ammunition of the following description: 30/06 cartridge firing 150-grain, round-nose, reloaded bullet from a distance of 35 yards. You omit reference to two exceedingly relevant features of the ammunition: velocity of the bullet, and construction of the bullet.

As soon as possible, please send answers to the following questions, for they bear very, very importantly on the validity of your tests:

- (1) Was the cartridge reloaded so as to achieve velocities that are normal for the 150-grain 30/06 (that is, about 3000 feet per second), or was it reloaded so as to achieve velocities corresponding to the ^{altitud} on-target velocity of the 6.5 M-C (that is, about 1800 feet per second)?
- (2) Was the bullet soft-nosed (with soft lead exposed at the tip), or was it full metal case (fully jacketed, with no lead exposed at the tip)?

The results of your tests and certain other considerations induce me strongly to believe that you used loads with the ballistic properties of normal factory ammunition. By normal factory ammunition I mean this: 30/06 cartridge; .30 caliber bullet, 150-grains, round-nose, soft-nose (soft lead exposed at the tip, copper jacketed elsewhere). This bullet moves at a muzzle velocity of about 3000 feet per second (fps).

* This must be the case, Bernabei.

- 1) Currently manufactured FMC .30 cal. ammo is spire point. All round-nose ammo is soft nose.
- 2) Reloading manuals give no data relevant to loading .30/06 ammo to velocities as low as 1800 fps. Hoch's tests are unlikely to have gone to the trouble of chronographing soft lead.
- 3) Unusually low-powered loads would require special sighting-in of rifle.

military target

I had previously indicated to others (most recently to Weisberg and Roffman, I think-- about a month or two ago) that the target-recoil effect which you discuss is common with certain weak-skinned liquid-filled objects, but that such recoil would not result in circumstances alleged by proponents of the notion that JFK was hit in the back of the head by a 6.5 M-C bullet. Later I'll discuss my reasons for believing this. Presently know that the phenomenon is not new to me, that I have witnessed it, have caused it to occur, and know others who are familiar with it. In fact, I am surprized that your shooting friends did not anticipate the phenomenon, for it is likely to be known to any kid who does no more than shoot apples off trees at close range. I am not trying to be funny; target-recoil is common and predictable with certain types of objects.

Since I am all but certain that you used normal 30/06 ammunition, ~~I~~ I'll discuss your tests as though in fact you did. If you used ammunition that simulates the 6.5 M-C round more closely than factory 30/06's, then you may rightly ignore much of what follows, for perhaps very little of what I have to say applies to your tests. But if you used standard ammunition, then you must either scrap your hypothesis that JFK's movements may be explained by target-recoil, or (what would seem the better course) you must begin anew and fire tests which properly simulate the alleged conditions of the assassination.

The normal .30 caliber ammunition that I suppose you used differs from the 6.5 M-C in two respects which are especially relevant to the validity of your tests (presently I disregard other differences): (1) the 6.5 is hard-nosed, fully jacketed, whereas the .30 is soft-nosed, with soft lead exposed at the tip; and (2) the alleged on-target velocity of the 6.5 is about 1800 fps, whereas the on-target velocity of your .30 is about 3000 fps. (At 35 yards a 150 grain bullet fired from a 30/06 rifle would not lose much velocity). Two things, then, demand your attention: the construction of the respective bullets, and their respective velocities.

For reasons that I'll explain in a moment, regard 2700 fps as the dividing line between "fast" and "slow" in bullet velocities. The 6.5 is hard and slow; the .30 is soft and fast.

You cannot deduce information relevant to the hard/slow bullet on the basis of your observation of what ~~happens~~ the soft/fast bullet does, for each type regularly produces distinctly different effects on the targets that they hit.

2700 fps is approximately the velocity at which soft-nose bullets become frangible projectiles. Moving at 2700 fps or more, a soft-nose bullet is likely to burst into numerous fragments even when it strikes relatively soft material such as flesh or (to refer to your tests) the crust of a melon (taped or untaped). As the velocity of the bullet increases above 2700 fps, the bullet becomes more and more likely to fragment. It will fragment almost immediately when it comes in contact with an object, very near to the surface ~~of~~ at the entrance point. ~~This soft/fast~~ This soft/fast bullet surely will fragment on contact with hard material such as bone.

For relatively heavy bullets like your 150-grain slug, slightly more than 2700 fps velocity may be required to cause an "explosive" shattering of the bullet, but in any case the bullet surely will expand ("mushroom") considerably, and will shed some of its lead as tiny fragments. Whatever happens to the bullet, its effect on almost any target will be different both in degree and in kind from the effect produced by a slow full metal case bullet.

A soft-nose bullet moving at less than about 2700 fps is likely to pass through soft objects without bursting, indeed often without shedding any of its substance. Soft/slow bullets may fragment on hard objects, but as the velocity falls fragmentation is less and less likely to occur.

If you fire through a soft object a bullet that is not only slow, but also fully jacketed, there is no possibility that the bullet will fragment. (I started to say "almost no possibility", but the situation of such a bullet bursting on soft material is so rare that the qualification is unwarranted. If such a fully jacketed bullet did fragment, I would suspect that the bullet was in some way defective: improperly constructed, or doctored.)

I explain what happens to these two types of bullets (hard/slow and soft/fast) when they impact on a target because what happens to the bullet directly determines what happens to the target. I have never known ~~soft~~ hard/slow bullets to produce the same effect on targets as soft/fast bullets; there is always a difference. I would not predict what the difference would be with melons, but I am assured that there would be ~~a~~ differences both in degree and in kind.

The target-recoil that you achieved with taped melons is consistent with the melons having been struck by soft-nose bullets moving at a velocity in excess of 2700 fps. I would have asserted this even before reading the description of your tests, for I am familiar with the phenomenon, and regard it as not at all unusual.

I am not the least convinced, however, that the target-recoil which you achieved is consistent with the melons being struck by hard-nose bullets moving at velocities less than about 2700 fps, for I would expect a different set of effects from such bullets.

I am more than willing to rescind that judgment if you tell me that you used hard-nose bullets which struck the melons at 1800 fps, for I am not unreasonably adamant in the face of your evidence. Ignoring all other considerations (which are in themselves convincing that JFK was hit in the head from the front as well as from the rear), I would perhaps even join you in asserting that the results of your tests can be extrapolated to JFK's movements, that JFK's movements after Z312 are consistent with target-recoil. (Even if I were fully persuaded that that ~~WERE~~ was the case, I would positively assert that the bullet which struck JFK in the back of the head was not full metal case, not fully jacketed like CE399. I regret that presently I can offer no more than my personal assurance that the evidence excluding the full metal case bullet is positive in itself and amply corroborated by other evidence. I'm obliged to treat this evidence confidentially for a while).

To summarise my response to your tests, your results are normal and predictable for standard .30 caliber soft-points; no surprises.

The best thing going for you is that you have not yet proved yourself wrong in applying the principle of target-recoil to JFK's movements. But it's not much to go on, for it appears that you have not yet begun striving to prove yourself wrong. The trials are usually a lot more severe than for striving to prove yourself right, but they are very necessary. You have adequately tested the principle, but you have not yet adequately tested your tests. Until you do, you have no warrant to apply your results to JFK's movements.

Your explanation of what causes target-recoil seems most satisfactory, and I am not the least inclined to dispute it, although (with my scant knowledge of physics) I had previously attributed it to other causes than those that you suggest. I do strongly dispute, however, that you can reasonably apply the principle to the alleged conditions of the assassination, for I think that you have not properly simulated them either in the ammunition that (I suppose) you used, or in the objects that you used as targets. (I have not yet mentioned the taped melons, for I think that the matter of the ammunition alone is sufficient to render your tests invalid for the assassination.

Consider that you used a missile of far greater power than that of the 6.5 M-C; that the physical properties of your missile affect both the missile itself and the target in ways that are likely to be significantly different from the effects produced by the 6.5; and that you used such ammunition on an object far lighter in weight and vastly more frangible than a human head.

(usually)

With all that, you succeeded in producing target-recoil that was relatively mild in comparison with the "recoil" of JFK's head and body.

see my letter in date of 6 Oct 70

This may be in error. I don't know. Head of melon ca. 6 lbs. etc.

~~Extra~~ I don't want to continue detailed criticism until I learn whether I am correct in believing that you used normal 30/06 ammunition in your tests, for if you did, further criticism is not necessary; your tests are invalid for the assassination.

Please do not interpret this letter as an effort to persuade you that you should abandon the hypothesis that JFK's movements can be explained by target-recoil. On the contrary, I urge you to persist-- not because I think that your results are valid for the assassination (for I do not), but because I think that properly constituted tests will prove that the principle of target-recoil cannot be applied to JFK's movements. If I am wrong, I am prepared to offer not only my apologies for causing you unwarranted concern over things which may-- in retrospect-- seem trivial, but also my gratitude for being properly informed.

Hobbs' calculations based on his camera going at 24 frames per sec. He estimates speed of JFK's head on the basis of 18 frames per sec. — at 24 frames per second, JFK's head moves faster than Hobbs' calculations.

I am not as convinced as you are that taped melons adequately simulate human heads. Although a certain thickness of filament tape may closely simulate the hardness of living bone (hard, but not brittle), it does not simulate the toughness and resilience of skin, which plays a large part in holding a head together when it suffers the impact of a bullet. Offhand I can suggest nothing that would properly simulate skin, but I recommend that you consider making some sort of skin-simulator a part of your test components.

A serious shortcoming of your use of melons is that they do not nearly represent the weight of a human head. To increase the weight of your melons you may perhaps inject them with sufficient quantities of gelatin or some other appropriate substance, although perhaps even that might not give you enough weight. I think, however, that you must somehow reproduce the weight of a human head in your targets.

The best thing to do, I suppose, is to consult a wound ballistics expert, and learn from him what would be the most suitable set-up. There ought to be one in the pathology department of your university.

There are several other aspects of your memo that I would like to comment about, but I have time now to mention only a few.

Your description of what ~~xxxxxxxx~~ constitutes "the most likely hypothesis which is consistent with just one assassin" is hideous. It is hideous chiefly because it implies what cannot be true: that there is a possibility, however slight, that JFK was fired upon from only one direction. Your assertions about the first and second hits are demonstrably false-- false to the degree that contrary assertions are not merely beyond reasonable doubt, but beyond any doubt.

The first bullet that struck JFK entered the front of his neck and was delivered from the front. It is possible to prove this beyond doubt, even without reference to the Parkland doctors' descriptions of the wound, although these fully corroborate what can be known by other means.

If you tell me that this knowledge may have bearing on your estimation ~~of the direction~~ of the direction from which the last shot was fired, then ask for it and I'll answer in my next letter to you. The answer is simple, and consists of information that you already know well. It is, moreover, unassailable. I think that it should have bearing ~~in~~ in determining the source of the last shot, for if the first came from the front, others may well have come from the same direction, too.

As for the assertion about the hit on Connally, it is inconceivable that CE399 caused any of Connally's wounds. You already know most of the evidence that bears on this; what has already been published is enough to exclude CE399 from consideration as having caused Connally's wounds-- any of them. There is additional evidence that you don't know; it positively and unequivocally excludes CE399. Here the matter is not all, nor even mainly, of my own doing, so I cannot pass it on to you by my own volition. The information is valuable to Harold, and he should determine who may share it. If you would be satisfied merely with personal assurances, you have mine, and you may seek Weisberg's, Roffman's, and Schoener's. If you write to them, refer to my memo on CE399, and ask merely whether or not it excludes CE399 from consideration in regard to Connally's wounds.

For the time being, I neglect your third assertion, that JFK was struck in the ~~back of the head~~ head only by a shot from the rear. My comments on this may be conditioned somewhat by the answer that you give me concerning the ammunition that you used in your tests. I have much to say, but not now. Even as I write I am reconsidering the evidence that bears on JFK's movements. There are some things that seem to vitiate the conclusion that only one bullet struck him in the head, but I would like to think about the matter carefully, for the evidence here may not be as positive as for the hits that I just mentioned.

The ~~length~~ length of this letter (longer than any which I have written to you previously; longer than any which I have written to anyone in the recent past) and the care that I have taken in writing it should indicate to you that I attach considerable importance to your memo. I regard the memo important for two distinct reasons. First, if your hypothesis proves plausible, anyone seeking to explain JFK's movements after Z312 will have to reckon seriously that target-recoil may have played the

decisive role in causing those movements. In this regard, you need do no more than prove that the hypothesis is plausible, for the means of gaining positive proof may never be forthcoming. Conversely, the integrity ~~of your work~~ of your effort demands that you yourself should be your most severe critic, that you should rigorously strive also to prove that the hypothesis is implausible, or even untrue.

Second (this is perhaps the more urgent reason at this time, for presently I do not regard your hypothesis about JFK's movements as plausible-- at least you have not yet demonstrated it to be plausible) your memo is important because it provides reasonable-sounding arguments in support of an assertion which (I firmly believe) the best evidence refutes: that JFK was struck in the head only from the rear.

Although your tests appear to have been improperly constituted, and although the memo has not yet been widely disseminated, even now the potentiality that your results and arguments will be misused is enormous. There are many people who-- for diverse and sometimes devious reasons-- are irrevocably committed to the assertion that there was but one assassin; they cleave to this assertion even when they believe that it is untrue. To them, any explanation supporting the idea that there was but one assassin is acceptable and useful, as long as it can be made to seem true, even when it is refuted by evidence.

For reasons which I may disclose later, I think that your associate Alvarez is one of those who, like Arlen Specter, treats the evidence as something to be "accommodated" to the idea that there was only one assassin; ~~xx~~ I think, moreover, that he will persist in that attitude regardless what evidence is set before him. If I am right about that, then your memo, if it proves wrong, will do ~~some~~^{much} damage. In fact, if I am right, then the damage is already done, and there is no way to rectify it. Alvarez will use the idea of target-recoil badly, as previously he used the "jiggle" business badly, and he will use it to the detriment of us all.

It is distressing that some of us who deal with the assassination set forth true assertions unconvincingly, but it is far more distressing (indeed it verges on disaster) to set forth false assertions convincingly. I regret to say it, but I believe that you have done this with your memo, that you have made a weak case appear strong.

*e.g. Alvarez's
article for
Playboy Feb 1964*

I hate to end this letter on such a sour note, for it may bring me recrimination that I believe I do not deserve. If you know me, either from my past correspondence with you or from Harold's comments, then you know that I would not disparage your work for any other reason than that I sincerely think it unsatisfactory. You know, too, that I speak with utmost regard for your interests. If you know that, regardless whether you think me right or wrong, justified or unjustified in my criticism, you will not let these comments be a source of personal friction between us.

Still,

Dick

Dick Bernabei

cc. Weisberg
Roffman
Schoener
Newcomb