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Dr. M. M. Doretsky
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Gower Street
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Dear Dr. Doretsky:

→ It is difficult for me to respond in detail to your questions about the timings in the Select Committee report because in spite of my direct letter of request for a copy of the report, I have received no copies of the final reports. I am surprised to find from your letter a discrepancy between the acoustic timings used in the Photo section and the final acoustic timings actually reported by the acoustic team.

I can only guess that the reason may go back to the fact that the photo report was drafted from data given to us around the time of Dr. Barger's testimony, and as you know, there was considerable restudy of the acoustic data once their implications and importance were recognized. There were slight adjustments, as in any scientific data reduction, between the very initial reductions, Barger's final reduction, and (I think) the later independent recheck of the acoustic data by a second team (Weiss and Aschnkenazy?). It is even possible in my mind that the Committee staff updated the acoustic numbers at the last minute and forgot to update the numbers referenced.

As you probably know, we were set up on quite independent teams, such as photo, acoustic, medical, etc., generally with different legal staff members of the Committee as our chairmen. Thus the analyses were prepared independently, although I thought the Committee had made more careful editorial checks than your discovery indicates. Anyway, our timing analysis came mainly, I think, from my suggestion that we look for the startle reaction, and our assigned duty was to make our own independent timings. Toward the end of this, the information came through about the acoustic tape, and we were excited to see if the work (which would have independent acoustic support of refutation. I argued that we should have a section comparing the two results, which is why that part of the report was drafted. But I sensed that this section had a little bit of "in limbo" status because it fell between the jurisdiction of the photo team and the acoustic team, as perceived by the legal staff members who headed our groups. Perhaps, different generations of acoustic data appeared in different parts of the report, but the acoustic report should have precedence in any discussion of acoustic data.

July 11, 1980

Having sketched the background for you, let me say that the only important thing you should look at is our report of the time intervals of the jerks on the film and the acoustic final determination of the intervals between the noises. (If the Select Committee's report-preparing process, which was quite rushed toward the end, allowed our report to get through bearing preliminary acoustic numbers that were later revised, that should not have happened, but it is irrelevant to the final scientific conclusions) The absolute frame numbers and "channel times", etc. are irrelevant since the clocks on the film and tape started at arbitrary independent times. Thus I disagree with your statement that time scale errors "as small as 0.1% can produce a timing error of 0.15 for the relative placement of the last two shots". An error of 0.1% out of 145 sec channel time is indeed 0.15, but this is a spurious number; it is only a function of the arbitrarily chosen zero clock time. An error of 0.1% would produce an error of only 0.006 sec in the measurement of the interval between noises, which is far below the accuracy of the procedure. I estimate that all acoustic and film time estimates are good to only, maybe, 0.1 or 0.2 seconds due to uncertainties in measuring when impulses began, when they peaked, and how fast the camera and tape were running.

So, I come back to saying that the final interpretation rests on whether you think the intervals as best estimated from film analysis and as best estimated from acoustic data are similar enough to make a compelling argument.

You might be interested that I was never too convinced of the case for the grassy knoll shot. Barger testified it was only 50-50, as I remember. I stood where Zapruder stood when the test shots were fired and the grassy knoll shot made my right ear ring. I would think Zapruder would have been more positive about it.

I entered the project with serious doubts about the Warren interpretation, especially the fact that brain material and the President moved in a direction not away from the Depository window, but away from the knoll. However, after examining the color photos of the wound and talking to forensic anthropologists who showed me skulls with bullet wounds, I became convinced that as energy of bullets increase, skull wounds essentially become explosive blowouts (the entry often remaining small), and the blowout geometry may be quite unrelated to the bullet line of flight. This was the nature of the President's head wound, and I have no difficulty accepting it as the blowout wound from a shot that entered at the rear. One should not expect a simple momentum transfer with all motions in a straight line.

Furthermore, I think it significant that the new evidence uncovered by the Committee moved away from the original reasons that provoked much criticism of the Warren report, not toward them. For instance, the preceding paragraph answers (for me) the problems with the wound and momentum. As another example, there was much questioning of the "magic bullet" and other bullet fragments, suggesting a second gun. But the neutron activation

Dr. M. M. Doretsky

-3-

July 11, 1980

analysis shows no evidence for more than two bullets in the car, nor evidence for a second gun, as I understand it. Third, the trajectory analysis by other members of our photo team matched trajectories to the Depository building window where the Oswald rifle was found. Fourth, our work removed doubt about the photos showing Oswald with rifle, I believe.

In a purely scientific enterprise we may not be sure of final answers, but it is usually important to notice whether newly uncovered evidence is moving toward or away from an early hypothesis. It seemed to me that the new evidence in this case tended, on the whole, to move away from the hypotheses that had been proposed about multiple gunmen firing from different directions. The attorneys who made final presentations to the Select Committee put a great deal of weight on that third grassy knoll shot suggested by acoustic evidence, but it is distressing that other evidence, such as metal fragments from a clearly different-composition bullet, was not available.

Our photo report suggests an earlier first shot than the Warren commission concluded, but that is perhaps the major departure from their scenario that I have in my mind.

Of course, questions of soft evidence, such as who Oswald might have talked to about this deed, are still open. But my overall judgment as a result of my experience to date is more comfortable with the picture of Oswald as a lone gunman than when I started the study.

Sincerely,



William K. Hartmann
Senior Scientist

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