

Secret Service

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MEMORANDUM

March 7, 1964

TO: J. Lee Rankin

FROM: Melvin A. Eisenberg

SUBJECT: Actual evidence concerning the shots
-fired in the course of the assassination.

Among the most crucial questions to be considered in determining the identity of the President's assassin or assassins are the number of shots fired in the course of the assassination, the spacing between the shots, and the location of the site, or sites from which the shots were fired. A great deal of evidence is relevant to these questions; for example, the number of wounds, the path of the missile causing each wound, the position of the rifle believed to have fired the recovered bullet and bullet fragments, the position and number of the empty cartridge cases believed to have been fired in this rifle, the number of recovered bullet and bullet fragments, and visual observations of bystanders. In addition, a mass of evidence has been collected concerning the aural observation of bystanders. The purpose of this memorandum is to point out that very little weight can be assigned to this last category of evidence.

A leading firearms textbook states flatly that "little evidence . . . should be put in what anyone says about a shot or even the number of shots." Hatcher, Jury, & Weller, Firearms Investigation, Identification, and Evidence, 420 (1957). This results from two interrelated factors:

1/ By the term "bystanders" I mean everyone but the assassin(s) and the victims.

cc: Craig, Adams, Spatter, Ball, Dolin, Willens, Redlich, Eisenberg

the difficulty of accurate perception of the sound of gunshots, and the acoustics of gunshots.

Perception. The sound of a shot comes upon a witness suddenly, and often unexpectedly. The witness is not "ready" to record his perception. The same is usually true of subsequent shots following hard on the heels of the first. For these reasons such sounds "are generally extremely inaccurately recorded in [one's] memory." Leid. Hatcher cites an example in which a deer hunter was asked how many shots had been fired by another hunter who was less than one hundred yards away. The deer hunter said, "Five." Actually, only two shots had been fired.

The perception of distance is as unreliable as the perception of number:

"[T]he observation of a sound is often unclear and subjective. A loud noise may appear to have been produced nearby, while a weak sound may seem to have been transmitted from some distance. This difficulty of estimating the distance from the site at which the sound is produced to the place where it is heard is increased considerably if the sound is of a nature unknown to the listener." Soderman & O'Connell, Modern Criminal Investigation, 43 (5th ed. 1962)

Similarly, as to the characteristics of the sound:

"Another subject frequently discussed in criminal cases is the report made by various types of weapons. People will go into court and swear on occasion that a weapon fired was a certain type and even make and model. Unless a great many other factors are known, such evidence may be sincere but it is utterly ridiculous." Hatcher at 417.

Obviously, during the assassination the surprise, emotion, confusion, and noise were much greater than is even usually the case, and bystanders' aural perception of the gunshots is therefore to be accorded even less weight than is usually the case.

Caution. Apart from the difficulty of accurately recording
aural perceptions of gunshots, the acoustics of gunshots are such that
the witness' perceptions may lead him to draw inaccurate conclusions.

(a) Number of shots. The firing of a bullet causes three
noises: (1) the muzzle blast, caused by the smashing of the hot gases
which propel the bullet into the relatively stable air at the gun's
muzzle; (2) the noise of the bullet, caused by the shock wave built
up ahead of the bullet's nose as it travels through the air; ^{2/}(3) the
noise caused by the impact of the bullet into its target. Each of
these noises can be quite sharp and may be perceived as separate "shots"
by an inexperienced or confused witness.

(b) Direction. If a bullet travels faster than the speed of
sound the acoustics are such that an observer at right angles to the
path of the bullet may perceive the shot to have been fired from a
site somewhere opposite to him. The reasons for this are illustrated
in the accompanying diagrams, adapted from Sederman & O'Connell.
In diagram 1, "A" is the killer, "B" is the victim, "C" is the witness,
and A - B is the actual line of the bullet's flight. Diagram 2 shows
the resulting sounds, J - K is the sound wave emanating from the
muzzle blast. L - M and O - N are the sound waves produced by the
bullet's shock waves when the bullet was at point X. Because the bullet

^{2/} This noise will be caused only when the bullet is travelling faster
than the speed of sound. We have asked for, but not yet obtained,
the precise velocity of the type of bullet used in the assassination.
However, it can be safely assumed that, as a military rifle
bullet, it was travelling much faster than the speed of sound.

is travelling faster than the speed of sound, the noise caused by the bullet at point X will reach C before the noise caused by the machine at Point A. Because the car locates noises at right angles to the source of a sound wave, C, hearing the sound wave O - M, will think that the bullet was fired from point B.

It must be emphasized that the above discussion is not merely theoretical, but is based upon the analysis and observations of professional criminal investigators. Furthermore this discussion is borne out by the very fact that the testimony of the bystanders to the assassination varies enormously. (Similar variances occur in the testimony relating to the Biggit killing.)

In my opinion in examining the Secret Service Agents, the utmost care should be taken to avoid giving the Commission the impression that the aural perception of these agents have much validity. These witnesses may or may not be more familiar with the sound of gunshots fired in the open than the other bystanders. Probably they are not. The fact is, that the contemporaneous reaction of the two agents in the President's car does not indicate that they were immediately aware that the sounds that they heard were gunshots.

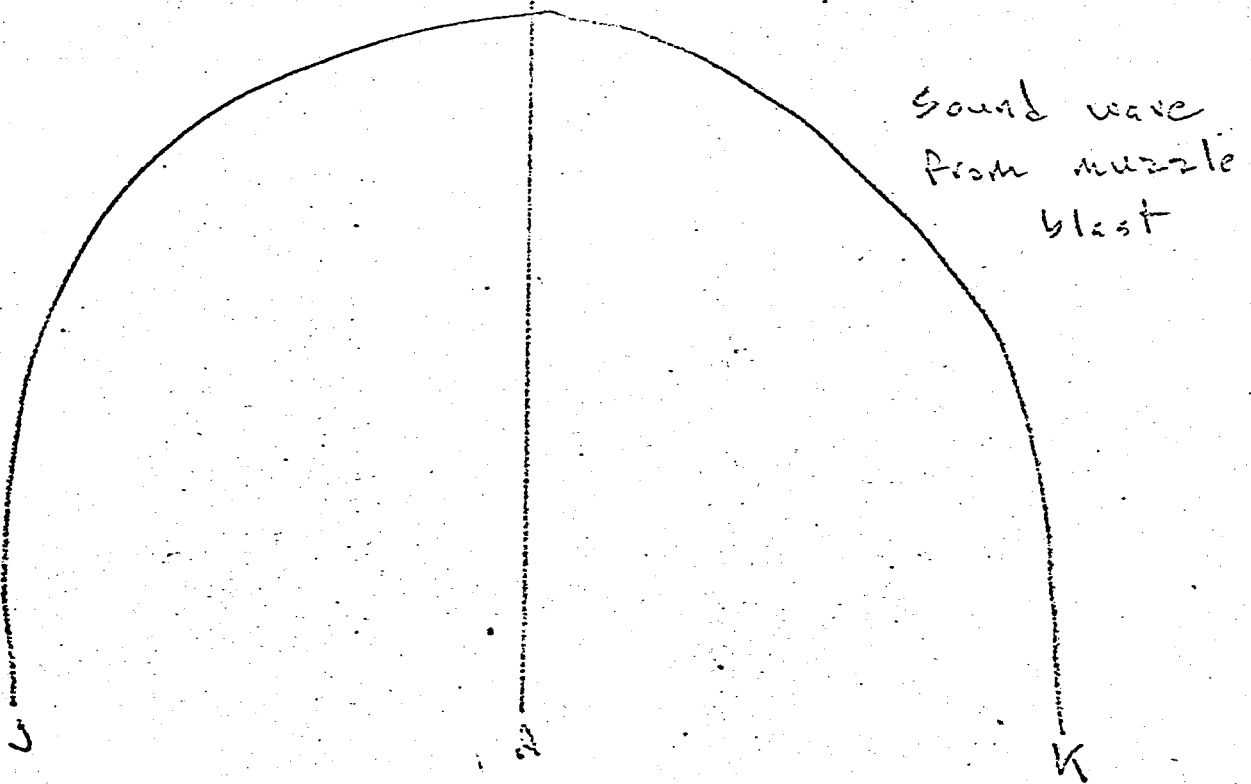
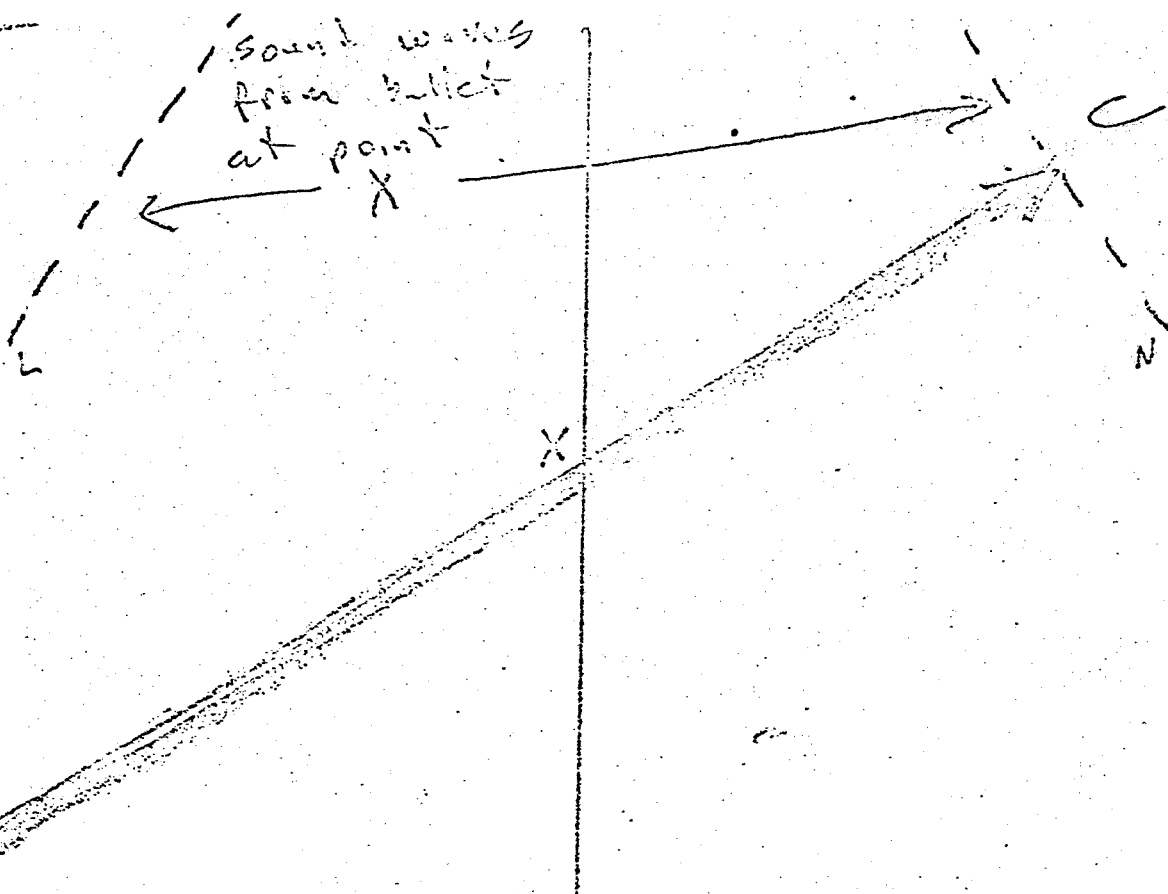
Kellerman states that "he heard a shot and immediately turned around looking past Governor Connally . . . to the President." (7.3) This statement seems to be contradictory by the photographic evidence which shows Kellerman looking forward and quite unconcerned after the President had been shot the first time. It is also belied by his failure to take any affirmative action to protect the President

apart from speeding up the car which apparently did not occur until after the third shot had been fired. (Another contradiction in Hallerman's testimony should be noted. In his first interview on November 22, he stated that the President said "Get me to a hospital." (7.3). In his next interview, 5 days later on November 27, he stated that the President said "My God, I've been hit." (7.7). This contradiction should be carefully brought out in examining him.) Greer stated on November 22 that "he first heard what he thought was probably a motorcycle backfire and glanced around and noticed that the President had been evidently hit. He thereafter got on the radio and communicated with the other vehicles, stating that they decided to get the President to the hospital immediately." He reiterated the gist of this testimony in a second interview on November 27. (7.10). In other words, Greer appears to have heard one noise, and thought that that sound was a motorcycle backfire.

Even if the agents do have more familiarity with such sounds, many of the other factors which may affect the probability of aural perception of gunshot would still be applicable.^{3/} I do not mean to imply that the agents should not be examined on this subject, but no impression be given that their testimony is inaccurate.

I intend in the near future to analyze the recorded testimony of bystanders as to the number of shots, etc., giving particular attention to factors which may have affected their perception. In addition, I think that we should have expert testimony on the subjects discussed in this memorandum.

^{3/} It is true, however, that since the Secret Service Agents riding in the President's car were located at the target point, their perception was probably less disturbed by the acoustic factors than the perception of persons at right angles along the path of the bullet.



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