

for Harold

11/29/69

MEMORANDUM: JFK ASSASSINATION  
TOPIC: Comparison of right-hand photographs of Commission Exhibits 562 and 564  
FROM: Howard Hoffman  
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BACKGROUND:

In a letter of 21 November 1969, I was asked by Dick Bernabel to make an examination of photographs which depicted CE's 562 and 564. The specific purpose of the examination involved comparing the right-hand sides of each photo. The exhibits themselves are arranged in the following manner. CE 562 proports to show a portion of the primer of one of the cartridge cases from CE 557; this is identified as "C14" and occupies the left side of the photo. The right side proports to be a similar view of CE 544 and is labeled "C7". CE 564 is arranged in the same manner except the right side of the photo proports to show CE 545 and is labeled "C38".

The exact words of the request in the letter from Mr. Bernabel are as follows:

"What I want to know is this: are pictures B (C7 from 562) and D (C38 from 564) separate photographs of the same object or are they pictures made from the same negative...Do pictures B and D emanate from different negatives, different snaps of the camera, or did they both come from the same negative, the same snap of the camera?"

Enclosed with the letter were two photographic copies of the exhibit in question. It is obvious that these photos came from the actual photographs, i.e. they were not copied from what is printed in the 26 volumes for no engravers dots can be seen. CE 564 definitely came from a copy negative; the origin of 562 can not be determined from the print sent to me. I have compared these two photos to what was published by the Commission and am satisfied that they are accurate, faithful representations of the original exhibits.

ANALYSIS:

Photographs B (C7) and D (C38) appear to be very similar. The differences which I have detected do not reflect the character of the original. On D there are several spots not present on B. These are characteristic of flaws in the developing solutions and do not bear at all on the negatives from which either photo was prepared. Also, both photographs exhibit tiny flecks of white spots which do not correspond. These could be traced to many things--dust on the negative, dust on the paper when printed, dust in the air--and therefore have no bearing on the original

negative from which each picture was prepared. There are also other marks the origin of which cannot be determined. At the upper left-hand corner of each picture are a series of roughly concentric arcs. There are more of these on B and they are also sharper on B. The positions of the arcs are different in relation to the substance of the actual photograph since each one is cropped differently. Because of the lack of knowledge of the source of these markings, I have given them no significance in the burden of this study.

Another dissimilarity is present on D. At the very right edge of the picture at the midpoint is an irregular mark which is shaped similar to half of an oval. The characteristics of this mark indicate that it is not the result of any of the developing processes mainly because it does not extend onto the white border of the photograph. It appears to me to be a fault in an ancestor photograph similar to a crease caused by holding the edge of the picture with the thumb and forefinger. This can be demonstrated rather simply by taking a heavy glossy photograph and bending down a portion of the edge with the thumb. If this is the case, as I am persuaded it is, then either all of CR564, or merely the right-hand portion is copied from another photograph.

The only other dissimilarity that I have been able to find is in the focus of the two pictures which I am using in this study. B appears to be slightly out of focus while D is comparatively sharp. This is illustrated best by comparing the small light highlights in each. In B they are fuzzier. However, this is the result of either printing the negative of B out of focus or the particular generation copy which B represents. It is definitely not the result of changing the depth of focus which the original (s) was taken with because objects at relative depths in each picture (B and D) still retain the same relative focus. This actually has no bearing on determining the question in point but ~~xxxxxxxxxxxxxxxxxxxx~~ must be eliminated as a possibility.

Other than what was previously mentioned, B and D are identical in all respects. A detailed examination was conducted of all light highlights in each picture and they were found to correspond to the most minute detail. The complexity of the highlights studied makes verbal description impossible but any viewer should plainly be able to detect this in comparing any area at all on the two pictures.

Measurements were taken on both photographs being studied to ascertain if the object in each was the same size. For example, on D next to the circle marked "1" at 7 o'clock is a fault which resembles the ~~xxx~~ head of an arrow. In circle 4 on D slightly below the dead center is the beginning of a light streak which follows a light bump. The distance between these two points was measured on D and found to be exactly 106mm. The same points were located on B (although B does not have similar circles)

and the distance was measured. It too was 106mm. Several other measurements were taken all of which confirmed that B and D depicted objects at exactly the same size. (This is only true of the photos given to me. As printed by the Commission there is a slight difference in size). Any difference in size in my photos was negligible or at least so small that it could not be perceived in millimeters.

Knowing that the two images were the same size, I overlaid the two pictures on top of an intense light source which gave the effect of transparent overlays. This allowed viewing of both pictures on top of one another. Initially the pictures were overlaid using the firing-pin indentations as reference points. When these were lined up, it was necessary to adjust the positions of the two pictures only a slight amount before both were seen to correspond exactly. With this done, I carefully went over each detail to look for any discrepancies whatsoever. As many details as were observable were checked. In each case, every detail in each picture perfectly overlaid; there was no difference in either size or position of the various objects on the primer. Thereby I concluded that B and D represented identical views of the primer portion of a cartridge case.

The next part of my analysis involved observation of the shadow characteristics to see if both were taken in the same light. When photographs are taken through a microscope, it is virtually impossible to duplicate lighting conditions from one picture to another. The slightest movement (even the movement required to take successive pictures of the same object) would most likely cause sufficient jarring to change very slightly the lighting characteristics. The exactness of all the tiny details as described in the previous part of the analysis is a very strong indication that the lighting conditions for both pictures were identical, thus indicating that both pictures originally came from the same negative. The most negligible change in lighting at that magnification (an infinitesimal change in the degree the light struck the base) would surely have changed the tiny microscopic marks which are identical on B and D.

The direction of the light is certainly similar in both pictures as is best illustrated by the shadow in the firing-pin indentation which was seen to correspond exactly in both photographs when they were overlaid over a bright light. Specifically, there is one good indicator of the direction of the light. At the very bottom of D just above the 8 in C38 is an object which is raised sufficiently to cast a long shadow. It is also visible in B. The angle between the shadow and the object was measured. In a series of five consecutive measurements on each picture, I obtained results of 58.5 to 61 degrees which indicates, within the limits of the actual photographic data, that the angle at which the light struck the base was the same in both pictures.

To test the validity of my observations that the identical microscopic details in B and D could be caused only by identical lighting conditions, I placed a piece of scratched brass under a microscope at a magnification of 90 diameters. I placed a light source in a fixed position to basically simulate the lighting in B and D. I found that the slightest movement of the metal, even by my hand holding the microscope, changed the relationship of the object to the light enough to alter the pattern of the tiny details such as small craters or bumps. A slight movement of the light source itself also produced this.

#### CONCLUSION:

Based on these observations, I am very much persuaded to conclude that photos B and D are one and the same--that they originally came from the same negative. When I was able to overlap the two pictures over a bright light, I was extremely persuaded that they originated from the same negative although the prints I was examining could have been several generations apart. I will state without exception that, in spite of the relative clarity of the two pictures, every detail on them is exactly the same. This I have verified by detailed comparison and overlaying. There are absolutely no differences in any of the characteristics portrayed in either picture. After I was able to see for myself the result of almost negligible changes in position of a metal object at 90 diameters, I was convinced that had B and D been the result of two separate negatives involving snapping a camera shutter twice and changing film at least once, there would be some sort of obvious difference in the tiny microscopic marks on the base. Certain marks would disappear and others would become seemingly larger. I therefore conclude beyond any reasonable doubt that B and D while possibly several generations apart, are from the same negative.

Howard Roffman