Thank you for
your thoughtful
note!

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AUTHENTICITY OF THE JFK AUTOPSY X-RAYS :

or WHEN DOES 2 PLUS 2 EQUAL 4?

New Evidence for Authenticity

Standard X-ray films contain an emulsion on each side of a transparent film base. When X-rays strike the film cassette they first pass through a screen which converts X-rays into light. It is primarily this light that produces the latent image on the film. There is a second screen on the far side of the film; X-rays continue on to also strike that screen. Its light induces a latent image on the opposite emulsion. If only the first screen were present, the image on the second emulsion would be very faint; this faint image derives from a small amount of light that crosses over from the first side plus a small amount from the primary X-ray beam.

Each brand of film has a characteristic curve of optical density (OD) vs X-ray exposure. Since the OD of two overlapping films is the simple sum of the individual ODs, so also the total OD of a single film is the sum of its two emulsions (plus a small amount for the nearly transparent film base). The characteristic curve for a single emulsion is therefore half the height of the curve for the entire film (which consists of two emulsions). The autopsy X-ray film has been identified through the assistance of the Kodak technical staff. At high exposures this curve reaches a maximum OD of nearly 4 (very black). A maximum OD of about 4 is typical of both current and historical films. Therefore the maximum OD of one emulsion should be about 2. This is valid also for both current and historical X-ray films.

The darkest parts of the JFK X-rays were measured again on June 16, 1995. These dark areas are located in the background, where only air was present in the original X-ray beam. These ODs are all near 4 -- on some films slightly above 4 and, on others, somewhat below 4. Small areas on several films (including the skull) have emulsion missing on one side (and only on one side) in the darkest areas. These single emulsion ODs are as expected, i.e., close to 2.

If an X-ray film is a copy, what ODs would be expected in the darkest areas? The usual film copying process employs a black light (partly visible, partly UV). This light effectively exposes only the first emulsion. Very little light is transmitted through the first emulsion to the opposite emulsion. This concept was already visited above -- two screens were needed to illuminate opposite emulsions. This unexposed emulsion will become lucent in the developing process (the silver is washed off). From this discussion then, we must conclude that a copy film cannot exceed an OD of about 2 anywhere, no matter how intensely it is exposed. The conclusion is clear: the extant JFK autopsy X-rays cannot have arisen by means of optical copying.

Arguments Against Authenticity (AAA)

1. On the lateral skull X-rays, the posterior portion is extremely lucent and the anterior portion is extremely black. This is completely unlike any patient or autopsy X-ray -- unless the black area represents near total absence of tissue. When this difference

was first measured it was tacitly assumed that the autopsy photos of the brain, although possibly suspect, where not grossly inaccurate, particularly not for the left hemisphere. My recent paper on the brain, however, reaches conclusions that are radically inconsistent with such assumptions. The vast difference between the lucent and dark areas can be explained by missing tissue in the dark areas. This has also been demonstrated experimentally by use of TEM inside a human skull. Such a resolution of this paradox, however, comes at a high price -- the brain photos then become suspect.

2. The second paradox of the OD measurements was the remarkable similarity between the posterior lucent area and the naturally lucent petrous pyramid area around the ear canal. These data measurements were repeated on many occasions; their OD similarity was consistent on all of these visits -- and so also was the visual impression of a white patch -- on both right and left lateral X-rays. There is yet no satisfactory explanation for this paradox. A normal human skull simply cannot, by virtue of known ODs of the component tissues, show such an image. Nineteen autopsied skulls from the 1960s and 1970s did not show such an effect. Two unexplored possibilities may require further examination.

The first involves technical factors. Numerous such factors have been discussed previously. None of them resolve this problem. Any new proposal should include marked compression of ODs in the toe of the characteristic curve. But, in addition to this, the actual tissue absorption in the posterior area and in the petrous pyramid area still must be quite similar -- and that still seems unlikely. A previously unexplored technical factor has emerged in recent discussions with a medical physicist. Information obtained from Jerrol Custer (who is unaware of the issues here) suggests that this explanation will not work. Prior discussions with the Kodak technical staff have seemed to suggest that this explanation cannot work either. I am attempting to review this further with the Kodak technical staff, who have heretofore been very cooperative. If this is a correct explanation it will have interesting ramifications for other facets of this case. A second potential explanation is discussed in the next paragraph.

3. The third problem raised by the ODs was the incompatibility (in the lucent area) between the AP and the two laterals. The remarkable lucency on the lateral X-rays was not apparent anywhere on the AP skull X-ray. If this represented a real object, its presence should have been detectable on the AP. In fact, nothing of unusual density is seen there. If, however, some physical object had been placed into the X-ray beam at the time that the lateral X-ray was taken, then that object could have produced the lucent area, and thus explain the paradox. Against this proposal, however, is (a) the absence of any eyewitness evidence for such an object in the beam and also (b) the absence of such an object on the AP skull X-ray. Of course, if this unknown object had been moved between the lateral and AP films then such a discrepancy might be seen. Custer claims that there was minimal movement of the head between the lateral and AP X-rays; this suggests that nothing in the beam was altered. In short, no clear cut solutions to these paradoxes are available at present.

If the unusual lucent area cannot be explained, then why should calculations of brain volume be believed?

It should first be recalled that the lucent area was, after all, claimed to be anomalous from the beginning of this work. It never was regarded as normal. No brain volume measurements were ever based on OD measurements from this lucent area. On the other hand, all calculations of brain volume are based on compatible areas. This compatibility is seen not only between right and left laterals but also between the two

laterals and the AP skull X-rays. Furthermore, the experimental data using skulls with TEM provide further confirmation of the self-consistency of this entire approach.

If the X-rays are truly authentic, then what other conclusions must follow?

1. The pathologists deliberately ignored the largest fragment on the X-rays (6.5 mm, at the rear of the skull), even though their professed purpose was to identify such fragments. And this one was highly accessible! (We can all speculate on why they might have wanted to ignore this particular fragment; that will make for interesting conversation!)

2. The array of tiny fragments at the skull vertex is authentic. Despite this, the pathologists placed these at an entirely different site -- ranging from the EOP to the right forehead. They were, of course, never questioned about this gross discrepancy -- an obvious and flagrant error. Some might argue that this was deliberate misinformation.

3. The Sibert and O'Neill report is wrong! The largest fragment was not at the front of the skull! It was obviously at the rear.

4. The reports of other observers at the autopsy do not recognize this 6.5 mm fragment, but they do reference the smaller one over the right frontal sinus. Does this mean that the pathologists did not even openly discuss the most obvious metal object on these X-rays?

5. Ebersole immediately terminated his conversation with me only after I inquired about the 6.5 mm fragment. Perhaps he did so not because the fragment was absent then, but rather because he was embarrassed at not reporting it during the autopsy (even though he must have seen it).

6. The review of the photos and X-rays (November 1, 1966) by Ebersole, Stringer, Humes, and Boswell for Barefoot Sanders is wrong -- there was indeed a large bullet fragment on the skull X-ray, which they did not identify, even at that time.

7. When he was questioned by the HSCA about the largest metal fragment on the skull X-rays, Humes again placed it above the right frontal sinus. Even then he said nothing about the 6.5 mm fragment. Either his memory was frighteningly poor (a dismal prospect in itself) or he was deliberately misleading.

8. Custer has claimed that the X-rays do not look authentic. I suspect that what troubles him is the remarkable difference in contrast between the prints and the original X-rays. I know that several of us, who had repeatedly viewed only prints of the X-rays, have been somewhat surprised, when first viewing the X-rays, at the lesser degree of contrast seen there. This may also explain Boswell's apparent uncertainty in viewing these prints, as reported in Livingstone's work.

In Conclusion: A Personal Perspective

Altered X-rays (a proposal not original with me) would constitute a powerful proof of post-mortem conspiracy. The loss of such a proof will be disappointing to some critics, as it is to me. In addition, however, I do not rest easily for having held an incorrect opinion. That has always been completely against my deepest values. In retrospect, however, alternate explanations for these multiple, and apparently powerful, OD paradoxes were not obvious -- nor are they even now! Although some critics were naturally less concerned with the problems posed by these OD data, for me it was difficult to ignore these paradoxes.[1] And, on the other side, there was no quantitative

[1] Though some apppeared to boggle at the supposed technical demands of altering X-rays, I was able to demonstrate (with surprising ease) that this posed no significant hurdle, particularly not for films of that

proof of authenticity that could demand my attention. But now we have that, with no thanks to any apologist. And though others may not have demanded this kind of numerical Holy Grail, nevertheless the hope for such quantitative evidence is exactly the Siren song that initially enticed me into this pilgrimage. Nothing less than such a rigorous demonstration would have sufficed as proof for me.

With OD measurements, I was pioneering a new trail. I have sometimes been asked to provide historical precedents for this use of ODs -- but none exist! To my knowledge, no one has ever asked the question this way before. Heretofore there has been no need for such an analysis -- the problem was always the inverse of this. The closest analogy to this use of OD data is bone densitometry for measurement of osteoporosis, but in this case the relative transmission of X-rays is being measured (by a photomultiplier tube) -- although ODs of X-ray film could probably be used with reasonable accuracy. It would just be a more inefficient and indirect process.

What troubles me most in retrospect (to mimic McNamara) is the superficial investigation of X-ray authenticity undertaken by the HSCA. Their experts simply looked at the X-ray films and pronounced them authentic. No measurements were ever taken. The brand of film was not stated (even though it is obvious on inspection), nor did they report the double emulsion present on the films (also readily ascertained). Nor was any comment made about another potentially significant issue -- the presence or absence of intensifying screens. So I had no idea what to expect when I first traveled to the Archives to examine these films. Surely the HSCA experts could at least have reported these three basic characteristics. And, although they did confirm the manufacturing date for the photographic film, they do not report doing this for the X-ray film. The HSCA could also have introduced Kodak experts to examine these films for authenticity. During my personal investigation, I consulted with Kodak. They willingly provided a surprisingly long checklist for authenticity. Such a checklist does not appear in the HSCA report. I later developed (independent of Kodak) a simple proposal. The removal of one emulsion (with bleach or razor blade) at a small site at one insignificant corner of the X-rays[2] and a similar removal at another corner on the reverse face of the film could instantly provide proof of authenticity: readily visible grid lines at both sites would be sufficient proof of authenticity.[3] That not only was not done by the HSCA -- it was not even considered, not even after a long list of experts had been consulted and the X-rays had been analyzed by at least one outside laboratory. And, finally, the fundamentally simple notion of performing OD measurements as described above, comparing single emulsion areas to double emulsion areas, was also never even considered.

If these many issues can be raised so many years later by a single investigator, it is only natural to wonder about the credibility and thoroughness of the other experts employed by the HSCA. The acoustic evidence (subjected to two separate HSCA analyses) immediately springs to mind; it was touted by Chief Blakey as evidence for conspiracy, but then later severely criticized by a panel of physicists. How could this audible (pun) misadventure occur? Were subtle pressures brought to bear on the HSCA

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era. In fact, such altered copies can literally be made within several minutes. No expert testimony was ever elicited on this question by the HSCA.

[2] Lest anyone object to such minor damage to the X-ray films, it should be recalled that significant pieces of fabric were removed from JFK's clothing. For the necktie, in particular, this removal continues to make contemporary interpretation difficult. By comparison, such objections would be unwarranted for these proposed minor tests on the X-rays.

[3] I have been unable to locate such a pair of sites (on one film) anywhere on the JFK X-rays. This test would still be trivial to do -- only providing that permission for it could be obtained. The several single sites found with one missing emulsion are consistent with authenticity: their ODs and continuous grid lines are as expected.

acoustic experts? I do not pretend to know these answers, but I am uneasy with the sequence of events in the acoustic arena. Other areas of supposed HSCA expertise have never been subjected to the kind of review that the acoustic data received, nor have the X-rays previously undergone the analysis described here. So one can only wonder what would happen to other HSCA conclusions if they were subjected to thoroughgoing second opinions. Areas of interest to critics include the neutron activation analysis, trajectory analysis, photographic alteration, firearms testimony, head snap testimony, etc. You can each add your own items!