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The Tell Tale Trajectory Lines

Over the past thirty years a pair of pencil lines have been present which were overdrawn on a postmortem lateral skull radiograph of President Kennedy and have held a significant clue to the proof that two gunshots struck the President's head. Recent research has provided a surprising explanation for their presence as well as a contemporaneously drawn diagram on the autopsy face sheet. This evaluation provides indirect evidence that the autopsy team and at least eight other eyewitnesses have not erred in their localization of an entry wound in the rear of the skull slightly above the EOP as described in the autopsy report and seen on the autopsy photos.

Following the arrival of the body at Bethesda Naval Medical Center, three radiographs of the skull were taken before any manipulations of the head were performed. These were taken by radiology technologists Edward Reed and Jerrol Custer under the supervision of Dr. John Ebersole the radiologist who was the acting Chief of the Radiology Department. When taking these x-rays, Edward Reed double loaded or placed two x-ray films in each cassette so that if one x-ray was not exposed adequately the developing time could be corrected when the second film in the cassette was processed if necessary. This was done to expedite matters so no time would be lost returning to the morgue from the 4th floor dark room and taking additional exposures of the skull. None of the films required adjustment of the processing time and after their work was complete Reed returned to the dark room and exposed all the films remaining in the double loaded cassettes to light thus completely blackening them and leaving no images.

The three 10 X 12 inch skull radiographs taken consisted of one AP and both left and right lateral views of the head and upper neck. These were brought to the morgue and used during the course of the autopsy. After the autopsy all the x-ray films were collected by Roy Kellerman and kept in the custody of the Secret Service. Neither the autopsy photographs or x-rays were supposedly available to Drs. Humes and Boswell when they prepared exhibits CE 386 and 388 for the Warren Commission. These were drawn by Harold Rydberg, a Navy medical illustrator, supposedly in a period of two days via only the verbal descriptions of Drs. Humes and Boswell. The x-rays and photos were not seen by the autopsy team until the November 1, 1966 Inventory for the Department of Justice. In this inventory note was first made of two angle lines having been overdrawn on the right lateral skull radiograph. (1) The DOJ Review was performed by Drs. Humes, Boswell and Finck on January 20, 1967. In this review the autopsy team was given an opportunity to rectify any errors or omissions which may have occurred due to the lack of the radiographs during the drafting of their autopsy. Remarkably the only comment

made concerning the skull x-rays was that they revealed metallic particles in the head. This brief comment was even more superficial than those made in the autopsy report when they were supposedly unavailable. Once again the autopsy pathologists chose to ignore x-ray findings which were antithetical to their original conclusions. While Dr. Ebersole had been invited to the DOJ inventory he was not included in the subsequent Review. The DOJ's lack of inclusion of a trained radiologist in this review to adequately evaluate findings on the skull x-rays should raise considerable concern and questions as to the DOJ's foreknowledge and motivations concerning this review. Had the radiographic findings been genuinely addressed this would have destroyed the validity of the original autopsy conclusions. As a result of this review and their denial of blatant x-ray findings, it was still the autopsy pathologist's opinion that the materials entirely supported their original autopsy conclusions. The large 6.5 mm in diameter lead fragment in the rear of the skull, located in a position entirely inconsistent with the trajectory for the bullet which entered slightly above the EOP, was not mentioned in the autopsy report or the 1967 DOJ Review. The lack of comment on this lead fragment on both these occasions is obvious because it would have indicated that a fragmenting bullet struck at a higher location in the rear of the skull from where they had documented the entry from behind of a nonfragmenting full metal jacket bullet.

While the large 6.5 mm lead fragment located 10 cm above the EOP was not overlooked by the Clark Panel, this group did overlook evidence for the entry of a bullet slightly above the EOP. This oversight was almost certainly intentional and calculated statements were included in this "blue ribbon" panel's report to bias any possible subsequent reviewers of these materials. Once again the skull x-rays played the pivotal role in this process. The radiologist included in the panel was Dr. Russell Morgan of Johns Hopkins who, during his lifetime, had a distinguished career. While he was a talented radiologist, his analysis and comments on the postmortem skull radiographs should raise questions as to why his talents apparently escaped him on this particular occasion. The most notable error which is entirely incomprehensible is his stating that there were two left lateral views of the skull taken in slightly different projections. (2) In actuality the 1966 Inventory had correctly identified both a right and a left lateral view of the skull being present and every other radiologist who has viewed these films, besides Dr. Morgan, has concurred. Dr. Morgan's misidentification of the right lateral radiograph as a left lateral one was a transparent attempt to hide the fact that there is a large fracture located on the right slightly above the EOP. This fracture coincides exactly with the level of entry of a nonfragmenting bullet as identified by the original pathologists and numerous other eyewitnesses to the autopsy. Curiously enough, while all subsequent reviewers of these radiographs for the government have acknowledged a right lateral view being present, none has commented upon this most important fracture either. More pertinent to this discussion is that Dr. Morgan went further on to say that "Also, on film #2 (the right lateral skull x-ray) , a pair of converging pencil lines had been drawn. Neither of these artifacts interfered with the interpretation of the films." (3) This description of the pencil lines was meant to downplay the implications inherent in the 1966 Inventory's description of these being angle lines. We should further question how Dr. Morgan decided that these were converging rather than diverging pencil lines. The true nature of these lines was not to be forthcoming for another 27 years. The DOJ was

satisfied that the final opinion of the Clark Panel "supported" the original autopsy's conclusion of a single bullet entering from behind despite the huge discrepancy between where each respective group located an entry wound in the rear of the skull. The supposed mislocation of the entry wound by the autopsy team and the implied incompetency played into the hands of the critics who were only all too willing to believe that they could have made an error of this magnitude.

In the ensuing years, the bias introduced by the stature of the Clark Panel's members edict of a bullet entering higher in the back of the head was not to be overcome. The complex of a large lead particle and radiating fractures at the cowlick was dramatic evidence that a bullet had struck much higher in the skull than where the autopsy report would have indicated. The much more subtle evidence, which supported the originally documented lower entry wound, went unreported. Critics were left to question why the jacketed bullet, which supposedly struck at the higher location, fragmented extensively whereas CE 399 had barely lost any lead. Others outside official government review panels, none of them trained radiologists, were allowed to see the autopsy materials but even those who might have entertained the possibility of two gunshot wounds to the head, so strongly suggested by the double head motion, were unable to overcome the bias of the Clark Panel and the dramatic evidence for a bullet having struck and fragmented at the higher location in the skull. The radiologists for the Rockefeller Commission simply parroted the initial interpretation set down by Dr. Morgan and the penciled in angle lines were again simply dismissed as artifacts.

While the Clark Panel and Rockefeller Commission had mainly with the autopsy materials themselves, the HSCA in its intensive investigation actually talked to many of the original participants in the autopsy and others involved in the original Warren Commission investigation. The Forensic Pathology Panel finally got around to discussing the x-rays with Dr. Ebersole. Dr. Ebersole was not a willing participant and would have preferred not to have come to Washington to testify. Recently released documents show that the head of the FPP, Dr. Michael Baden, had contacted Dr. Ebersole a few months prior to his testifying before them. During this conversation, Dr. Baden brought to Dr. Ebersole's attention that a member of the Panel, probably Dr. James Weston, had raised the question of whether angle lines on the right lateral skull x-ray might possibly represent trajectory lines. (4) This development persuaded Dr. Ebersole to agree to come to Washington and testify. In an interview to his hometown Lancaster, Pennsylvania newspaper, Dr. Ebersole said that the most important reason for his consenting to go to Washington was to clear up a matter about pencil lines present on the x-rays. In his testimony before the FPP, Dr. Ebersole told the group that approximately one month or so after the assassination he was called to the White House Annex by a representative of Dr. Burkley's office. The alleged purpose of this visit was to take some measurements on the skull x-rays which he was told would be of some interest to a sculptor. According to Dr. Ebersole, the lower of these lines, which runs horizontally, was drawn from the nasion to the occiput. The second line was an attempt to get from the high point of the forehead back to the occiput. These were supposedly anatomical landmarks which would be recognized by an artist. The results of these measurements were of such importance that after returning to Bethesda and making some calculations the results had to be relayed in a verbal code when communicated across open phone lines. (5) Questions

which immediately arise are why were the poor quality postmortem skull x-rays used for this purpose when good quality premortem skull x-rays existed. Why did such secrecy surround this process when they were for a work of art which would presumably be on public display. Also, what particular experience and insights did Dr. Ebersole have that other radiologists did not. The fact that these angle lines were drawn under conditions of secrecy at the request of Dr. Burkley's office by the only radiologist present the night of the autopsy within the first months after the autopsy on a lateral postmortem skull x-ray of the President who had died from a gunshot wound to the head for the ultimate use by an artist should provide a few clues as to their true nature and purpose. In his interview with his hometown newspaper, Dr. Ebersole's stated purpose for coming to testify in Washington was to clear up some confusion about pencil lines on the x-rays. How frank Drs. Ebersole and Baden's discussion was on the phone prior to his testimony will never be known unless Dr. Baden chooses to tell us. Perhaps Dr. Baden was all too willing to believe a fanciful and ridiculous story that Dr. Ebersole might have told him to cover-up the true nature of these pencil lines. After this conversation in a telephone call with Andy Purdy Dr. Baden curiously described Dr. Ebersole as a "good man". (6) Certainly he was not referring to his abilities as a radiologist for had Dr. Ebersole been successful in recognizing and forcing the autopsy team to acknowledge the discrepancy between the lower entrance wound and the metallic fragment distribution the night of the autopsy entirely different conclusions would have been reached. Perhaps he was a "good man" because his personal refutation of their significance before the FPP would possibly disarm in the mind of the one member what the implications would be if they supported the original autopsy team's documentation of a bullet having entered slightly above the EOP. If these lines lead to the recognition of the right occipital fracture, which had gone unreported by the consultant radiologists and was evidence for the lower entrance wound, then the previously unchallenged conclusions of only one gunshot wound to the head would be in jeopardy. A conclusion of two gunshot wounds to the head striking at different locations would provide the most plausible and rational explanation for not only the double head movement seen on the Zapruder film but the tenacity by which the autopsy pathologists stuck to their original location for an entry wound. As things have turned out the trajectory lines were not needed to provide the clue to the determination of two gunshot wounds to the head but they have provided strong indirect corroborative evidence. I can now make clear what their original purpose was.

We can now go back to the time when Dr. Ebersole first drew these angle lines and ask ourselves what artist might have been interested in these specific lines which do not conform to any known "anthropomorphic" measurements. We should have a high degree of suspicion, as did one member of the FPP, that these were indeed trajectory lines. Given that they were drawn on the lateral skull x-ray of a homicide victim who suffered a gunshot wound to the head with one line being on the horizontal and the other corresponding to the points of entry and exit described in the autopsy report, this seems a very likely possibility. Dr. Ebersole's story about the purpose of these lines did have some elements of truth in it except their true purpose. In fact there was an artist who might have been very interested in this trajectory in the first few months after the assassination. That artist was Harold Rydberg who was preparing CE 388. By an amazing coincidence the pencil lines drawn on the lateral skull x-ray match almost to the degree

the trajectory lines present on CE 388. (Fig.1,2) They both measure very close to 32 degrees. It is beyond my imagination to believe that these matching trajectory lines were drawn on CE 388 without the direct or indirect use of the measurements off the lateral skull x-ray. Interestingly the perspective of CE 388 is in the same straight side view of the head just as the lateral x-rays. There are strong implications that the x-rays were used as a template for CE 388 which made no attempt to take into account the tilted attitude of the President's head towards the left at the moment the fatal head wounds struck. When CE 388 and the lateral skull x-ray are compared side by side you see that they both intersect the skull at the same level slightly above the EOP. The clue that they point to is the transverse fracture of the right occipital bone which was created as a 6.5 mm Mannlicher-Carcano bullet entered the back of the skull at this lower level. In addition, both CE 388 and the x-rays show that there was intact bone intervening between the hole of entrance and the large defect at the vertex. Roy Kellerman told the Warren Commission that there was 2 inches of intact bone between the small hole of entry and the large defect at the vertex. (7) The x-rays demonstrate the validity of his observations of 2 inches of intact bone seen between the large defect and the level of the small entry hole. What CE 388 does not conveniently depict is the lead fragment distribution which is antithetical to this lone trajectory and this is why the x-rays could not be shown to the Warren Commission. The x-rays and several other items provided evidence the night of the autopsy that a second fragmenting bullet had struck the skull. Additionally, Dr. Boswell's diagram has the same 32 degree angle and most likely represents an attempt to show the trajectory of a bullet entering low in the back of the head and exiting the frontal area from a perspective looking at the undamaged profile of the President. (fig.3)

As a personal note, I must say that using only the photographs of x-rays contained in the book Best Evidence, I finally identified the transverse fracture of the right occipital bone and the significance of the principle of intersecting fracture lines which support the autopsy team's documentation of a lower entry wound. This was after many months of staring at the x-rays and trying to make sense of them guided in the belief that there must have been two shots to the head to cause the double head motion. For a short time, using these poor copies, I thought that the x-rays might be fake. However by testing concordances between the x-rays and the many observations that had been made by those present at the autopsy I realized that they must be authentic. Believing them to be authentic did not, however, automatically provide the solution. It would take several frustrating months dealing with the evidence to arrive at a crucial insight. This occurred when I was comparing the HSCA's Ida Dox drawing of the damage to the skull, drawn under the direction of a radiologist Dr. David O. Davis, with the postmortem skull x-rays. As I looked at the Dox illustration I realized that Dr. Davis he had left out one of the major fractures of the skull namely the one in the right occipital bone slightly above the EOP. (Fig.4) I had seen this fracture a thousand times and overlooked its significance because it was not adjacent to any lead fragments. With all the meticulous attention to detail that this drawing had, I asked myself why such an obvious fracture had been left out. It was at that moment that I began to question whether this fracture might have been generated by a bullet entering slightly above the EOP. Due to this insight I was able to overcome the terrible bias that the Clark Panel had introduced into the case. The more I examined the materials and the accounts of eyewitnesses, including Kellerman and many

others, the stronger my belief in the authenticity of the autopsy materials became. While I had always been intrigued by the comments on the pencil lines, the photographs contained in Best Evidence were not clear enough for me to see them. It was an unforgettable moment when I received good photographic copies from the National Archives in January 1993 and saw that the angle lines pointed to the fracture of the right occipital bone. I knew at once that these were trajectory lines and shortly thereafter I realized that they matched those on CE 388. Having had the privilege of viewing the autopsy materials on numerous occasions, I am absolutely certain of their authenticity. These materials allow the conclusion that the President was struck twice in the head as has long been suspected by the critics.

On December 1, 1966 J. Lee Rankin responded to a memorandum Wesley Liebeler sent to ex-members of the Commission on November 8 of that same year. I disagree with Rankin in that I am not satisfied with the testimony of the doctors who performed the autopsy because the photos and x-rays prove they did not tell the whole truth and perjured themselves before the Warren Commission. The best evidence can not be found in the words of those who would lie and deceive us. Neither will any answers be found by continually challenging the validity of the objective evidence which has been set before us. The best evidence available to us today is contained in the authentic radiographs and photographs taken the night of the autopsy. These materials do not know how to lie and stand as a silent witness to the mortal damage that was inflicted upon President John F. Kennedy. The truth they hold exposes the lies of those who have tried to deceive us. The Clark Panel recognized and acknowledged the obvious evidence, which the autopsy team chose to deny, that a fragmenting bullet struck the skull several inches higher than where the autopsy team has persistently and correctly maintained that a bullet entered. The autopsy team has provided evidence that a bullet entered several inches lower than where another bullet had obviously struck and the Clark Panel deceived us by not acknowledging the much more subtle radiographic evidence which supported the autopsy team. Both shared in the lie that President Kennedy was struck in the head by only one bullet. Disguise and deception in the assassination has never been the result of alteration of the body, the Zapruder and Nix films, or the autopsy photographs or x-rays. The deception has been carried out by those who have refused to face the full truth contained in the evidence.

While the photographs of the HSCA's computer enhanced versions of the AP and right lateral skull x-rays are not as good as the originals, the pencil lines can be clearly seen. Their presence there is not only a problem for the government's experts but also for the critics. It is a sad comment that these trajectory lines went unnoticed under the "critical" evaluation that one would suspect that these materials should have undergone before being declared fakes and forgeries. It will be left for those critics who persist in the belief that these radiographs are forgeries to come up with their own explanations as to what the true purpose was for these trajectory lines having been drawn on these films. Perhaps they can succeed where Dr. Ebersole failed.

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References

1. Report of Inspection by Naval Medical Staff on November 1, 1966 at National Archives of X-rays and Photographs of Autopsy of President John F. Kennedy p.2
2. 1968 Panel Review p.5
3. 1968 Panel Review p.12
4. NARA RG 233 HSCA Rec. # 180-10102-10409 Agency File # 013617 p.67
5. NARA RG 233 HSCA Rec. # 180-10102-10409 Agency File # 013617 p.5-6,11-12
The tape of Dr. Ebersole's interview contains the comments about anatomical landmarks which would be recognized by an artist. These comments were not included in the transcript of his interview.
6. NARA RG233 HSCA Rec. #180-10071-10066 Agency File #005105
7. 7H81

Figure 1. Rt. Lat. Skull X-ray with pencil lines emphasized pointing to fracture slightly above EOP

Figure 2. CE 388

Figure 3. Boswell's Face Sheet diagram superimposed on autopsy photo

Figure 4. HSCA drawing of damage to skull omitting lower transverse fracture