

ORIGINAL

1 IN THE DISTRICT COURT OF THE UNITED STATES
2 FOR THE WESTERN DISTRICT OF TENNESSEE
3 WESTERN DIVISION
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6
7 JAMES EARL RAY,)

8)
9)
10 VS.)

CIVIL ACTION

NO. C-74-166

11 JAMES H. ROSE, WARDEN.)
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18 VOLUME V

19 THURSDAY MORNING

20 OCTOBER 24, 1974
21
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24

DR. HERBERT MACDONELL

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2
3 The said witness, having been first duly sworn,
4 testified as follows:

5 DIRECT EXAMINATION
6 BY MR. FENSTERWALD:

7 Q. Professor MacDonell, for the record, will you give
8 us your full name and correct spelling, please?

9 A. Herbert Lynn MacDonell. The last name is spelled
10 M-a-c-D-o-n-e-l-l.

11 Q. And what is your current address, Professor?

12 A. The mailing address is Post Office Box 1111,
13 Corning, New York 14830.

14 Q. And what is your present occupation?

15 A. I am director of the Laboratory of Forensic Science,
16 an independent consulting laboratory. I am Professor of
17 Criminalistics, Elmira College and special lecturer in
18 criminalistics at Corning Community College, and am the
19 assigned consulting criminalist.

20 Q. And could you tell us what educational degrees you
21 hold and from what universities?

22 A. Yes. I have a Bachelor of Science Degree from
23 Alfred University, in 1950, in Chemistry; a Master of Science
24 in Chemistry, specifically analytical chemistry, from the

1 other programs of short duration, but one of eight months
2 duration in criminalistics under the Department of the
3 Attorney General in the State of Rhode Island, and have main-
4 tained training programs in police science under the
5 sponsorship of the New York State Police and the Pennsylvania
6 State Police, and others.

7 Q. And what teaching experience have you had?

8 A. Other than graduate assistantship in chemistry and
9 microscopy I have been a professor of chemistry at Milton
10 College, Milton, Wisconsin, for three years, and in 1968
11 I began teaching criminalistics at Corning Community College,
12 and since 1972 in January at Elmira College, and have been
13 an instructor in police science at Corning Community College,
14 plus other seminars and institutes of a week duration that
15 are held across the United States from time to time.

16 Q. What industrial experience have you had?

17 A. I have been a research and analytical chemist for
18 the DuPont Company at the Marshall Laboratory in Philadelphia
19 for one year, and for over fifteen years a research analytical
20 chemist for Corning Glass at the Research Laboratory in
21 Corning, New York.

22 Q. How about experience in scientific crime investiga-
23 tion?

24 A. I was employed for two years as a forensic scientist
25 with the Rhode Island State Crime Laboratory, and since 1950

1 have acted as a consultant in both criminal and civil cases
2 for, I believe, twenty-two states and the Virgin Islands.

3 Q. Do you belong to any scientific societies?

4 A. Yes. I am a member of the American Association for
5 the Advancement of Science, a national honorary scientific
6 society.

7 Q. Do you belong to any societies that limit memberships
8 to your particular field of forensic science?

9 A. Yes, I do. I am a fellow of the American Academy of
10 Forensic Sciences, and am past chairman of the Criminalistics
11 Section of that society, and past secretary of the
12 Criminalistics Section. I am a member of the Canadian and
13 British Academies of Forensic Science, and of the International
14 Association for Identification, and chairman of the Science
15 and Practice Committee of that association. I have been a
16 member of that association for approximately fifteen years,
17 and I am a member of the Association of Firearms and Tool
18 Mark Examiners.

19 Q. Have you published any articles during your career?

20 A. Yes, I have. I have published approximately forty-
21 five technical articles in analytical chemistry and forensic
22 science, and have written chapters in books as well as a
23 government pamphlet on the interpretation of bloodstain
24 evidence.

25 Q. Now, one or two areas in which we are going to seek

1 to Memphis to examine certain evidence relative to this
2 hearing?

3 A. Yes, sir, I did.

4 Q. And what did you examine?

5 A. I examined a windowsill, and bullet fragments,
6 projectile fragments, jacket fragments, in the office of
7 Mr. Blackwell, I believe it is, the clerk of the criminal
8 court.

9 Q. And what was the purpose of your examination?

10 A. The purpose was to determine whether or not the marking
11 on the windowsill could be identified and related to the
12 object that caused it, and the purpose of examining the
13 fragments was to determine if identification could or could
14 not be made of the weapon that fired it.

15 Q. I would like, Mr. MacDonell, to take these two items
16 one at the time.

17 I would like to take up the question of the windowsill
18 first. Could you describe the location, shape and size of
19 the indentation that was made in the windowsill?

20 A. Yes. I would like to refer to the notes that I took
21 if I may.

22 Q. You certainly may.

23 A. The marking I observed, which was outlined in chalk
24 and initialed RFQ, I believe, is -- though I couldn't read
it exactly, is essentially in the center of the long dimension.

1 which is approximately a thirty-two inch windowsill, and
2 approximately one inch from the side. Whether that's the
3 front side or the rear side, I am not sure. It is the side
4 opposite the painting, and, therefore, I would assume that
5 it was the outside; though this is something that I couldn't
6 determine without matching nailholes in the windowsill to
7 the actual window casing.

8 Q. First, did you examine it microscopically?

9 A. Yes; with a Spero Binocular microscope.

10 Q. Were you able to form an opinion as to whether or not
11 the indentation in the windowsill contained sufficient detail
12 to determine the nature of the object that made it?

13 A. Yes, I was.

14 Q. What was your opinion?

15 A. Using several cross-lightings to highlight this, it
16 was possible to detect the indentations and ridges that
17 might result from tool work, such as chisel marks, something
18 of this kind, but I could not find sufficient detail to
19 indicate general characteristics, let alone individual
20 characteristics, and based upon the examination I conducted,
21 I do not believe it possible to determine even the class of
22 the object that made that indentation, let alone a specific
23 or positive identity of that object.

24 Q. At the guilty plea hearing March 10th, 1968, it was
25 stated that Mr. Robert A. Frazier, of the FBI, examined the

1 windowsill, and I will read you a single paragraph which,
2 Your Honor, comes at pages 96 and 97 of the Otwell transcript,
3 quoting -- "That he also made microscopic comparison between
4 the fresh dent in the sill of the window at the bathroom,
5 422½ South Main, and concluded that the microscopic evidence
6 in this dent was consistent in all ways with the same
7 microscopic marks that appear on the barrel of this rifle,
8 30.06 rifle."

9 Could we have your comments on that conclusion by
10 Mr. Frazier?

11 A. Well, I don't think it is possible to make a micro-
12 scopic comparison of the machine marks on the barrel, which
13 from this cut would have to be the muzzle to it, that would
14 be the only portion of the barrel that would be capable of
15 making such a clean, fine cut. It certainly couldn't be
16 made further back from the muzzle toward the stock, and
17 there just isn't enough detail there to make that examination
18 in raw weather wood and conclude that a positive identification
19 could be made; so I disagree with that.

20 Q. If I understand you correctly, you say if it could
21 be made by the gun at all, in your opinion it would have to
22 be made by the muzzle being rested on the windowsill and not
23 the barrel further aft?

24 A. That's the only ninety-degree portion of the barrel
25 that is exposed that could allow such a dent or cut to be

1 made. So if it was made with the barrel, it wasn't with
2 the circumference or the periphery of the barrel. It would
3 have to be made with the muzzle or possibly the front sight.

4 Q. If it had been the muzzle or the front sight, would
5 there have been other markings on the windowsill?

6 A. Not necessarily. It could have been just bumped or
7 hit in a rather awkward configuration.

8 Q. Suppose the gun was fired with the muzzle resting
9 there? What would have been the result?

10 A. Well, it would have torn up the windowsill. If the
11 bullet itself or the projectile did not track the barrel,
12 the muzzle blast would have left indelible markings that
13 would have been very evident.

14 Q. Did you find such markings?

15 A. None whatever.

16 Q. And you say that you cannot match up that indentation
17 with any part of the record?

18 A. No, I could not. For two reasons -- not only the lack
19 of individual characteristics or fenestral characteristics,
20 but the spacial relationship of the window and the geometric
21 location of the windowsill preclude that instrument, at a
22 nominal length of forty-two inches, fitting in the available
23 space with the angle of that mark. Maybe I could diagram
24 that and make it more simple.

1 THE COURT: All right. There is a grease
2 pencil over there, please.

3 THE WITNESS: The windowsill is approximately
4 thirty-two inches in its longest dimension, approx-
5 imately thirty-one and three-quarters, and at approx-
6 imately the center, which is sixteen inches and a
7 quarter, and at the beginning of this measurement
8 of sixteen and a quarter is a seven millimeter long
9 cut, and the cut is outlined in chalk, which I will
10 indicate the chalk in red, and approximately fifteen
11 inches to the other end, and the length of this
12 (indicating) is approximately, therefore, a half-
13 inch. This dimension is five inches, and the
14 thickness is one inch (indicating). Not having a
15 protractor I simply placed two rulers along here
16 to determine the angle, which could be easily
17 determined from the markings. This is three inch
18 by five and one-quarter inches (indicating) --
19 I will say, approximately, because without a
20 drafting board, it is not possible to make measure-
21 ments to a hundredths of an inch, of course. None-
22 theless, this well defines the angle of the markings,
23 the cut. The photograph, Exhibit 106, shows the
24 windowsill approximately eighty-eight, eighty-nine

1 five to six millimeters on the photograph to the
2 wall, I -- I don't know which wall it is. I will
3 call it the wall to the left of the window behind
4 the bathtub. I don't know the direction. That
5 makes this approximately one point eight inches.
6 We will call it two inches to be generous.
7 Projecting back in a straight line from this mark
8 at the angle and perpendicular, normal or ninety
9 degrees to the marking, which would, of course,
10 be the only way that a cut could be made if it
11 were, in fact, made with the barrel, as I believe
12 the affidavit states, and not being possibly made
13 with the curved area or the circumference of the
14 barrel, and this then projects back in a straight
15 line looking directly down on it, to be thirty-
16 two inches, and I would then be very liberal and
17 put plus or minus ten percent, or let's say four
18 inches in round figures.

19 Now, recognizing the fact that if the windowsill
20 in cross section, had the barrel really gone on it --
21 the barrel B -- A in the lower right, and this B,
22 and then any point of impact would have to result
23 only if the barrel were tipped at some angle,
24 indicated by the dotted line, and the line circled
25 "A" before that cut could be made. and recognizing

1 further that as one brings up the barrel along
2 the wall, the dimension increases, I simply --
3 perhaps I should go to another sheet. I simply
4 took the thirty-two inches in the horizontal, in
5 the available space between the marking and the wall,
6 and projected it up to that point, that would allow
7 forty-two inches, which is the length of the Model
8 760 Game Master Remington rifle, and it approximates
9 a height of twenty-six inches. Again, to be liberal,

10 I will say plus or minus four inches, because I
11 do not have architectural drawings and protractors
12 to work with. But this type of measurement should
13 be, and I would presume already had been made, to
14 just determine how can a weapon fit into the
15 available space to make that cut, and that is the
16 only possible configuration. If indeed the marking
17 is on the outside of the window, as I have indicated
18 the paint in the room in the first diagram, then
19 wherefore the window itself would be -- it would
20 intercept, since the marking is out further like
21 that, and there has to be an interception there,
22 and perhaps that would explain how it was caused,
23 if the window stuck and someone put it in there
24 and pried it up, but that would certainly leave
another marking on the window. But just a matter

1 of whether or not it can fit the available space
2 and if it is tipped up at something approximating
3 thirty to forty-five degrees, that's the only way
4 it would fit if the stock or butt plate were against
5 the wall.

6 Going back to the windowsill, if we reversed
7 the windowsill, because I am not certain which is
8 inside and which is outside, as I previously stated,
9 then that would put the mark even closer to the wall
10 and inside so that the distance -- that it shifted
11 to the left, from fifteen, rather from sixteen and
12 a quarter to fifteen inches, and it would have
13 shifted to the inside and make it even a shorter
14 distance. This distance, of course, is shorter than
15 that distance -- the red is shorter than the black
16 (indicating throughout).

17 So, in other words, by proportioning up from
18 the photograph to determine the distance of the
19 windowsill edge to the wall, there is a maximum
20 distance available, and if a forty-two inch weapon
21 will not fit into it, then there is no possible way
22 it could have been the marking from the muzzle end,
23 which is the only one, in my opinion, that could
24 have made it.

1 THE COURT: (Interposing) I sustain the
2 objection.

3 MR. HAILE: Or if he wants to qualify
4 Mr. Ray as a marksman.

5 THE COURT: I sustained the objection,
6 Mr. Haile. Go ahead.

7 MR. FENSTERWALD: Thank you.

8 Q. Mr. MacDonell, I would like to return to the question
9 of the bullet and bullet fragments. Did you examine the
10 large part of the bullet that was removed from the body of
11 Dr. King?

12 A. Yes, I did.

13 Q. Could you describe in as much detail as possible its
14 size, shape and distortion?

15 A. Well, it is a mushroom jacketed projectile, bullet,
16 which has lost the lead core through mechanical disruption
17 or impact. The casing or jacket, as it is accurately called,
18 the jacket exhibits excellent striations. There are six
19 righthand rifle grooves. The width and all the dimensions I
20 have here are consistent with a 30.06, and in my indexing or
21 assigning values to land and groove, I arbitrarily took this
22 as rifle groove No. 1, to correspond to the folded over line,
23 which Q-64 RF is inscribed on the inside of the jacket where
24 it is folded over, and I arbitrarily took that as No. 1.

25 Looking at the base and going in a clockwise fashion, there

1 seems to be sufficient detail in groove No. 1 and groove
2 No. 5 that an identification ought to be possible. I am not
3 going to say that it absolutely is. But it exhibits suffi-
4 cient detail that with a combination of those two groove
5 striations alone I believe an identification of the weapon
6 should be possible, provided that the weapon was not abraded
7 or the rifle in some way altered through chemical and
8 mechanical abrasion prior to test-firing cartridges for
9 comparison.

10 Q. Did you examine this bullet fragment microscopically?

11 A. Yes, I did.

12 Q. Let me read to you, if I may, again, from the
13 transcript of March 10th -- well, I think I prefer, Your
14 Honor, to read from Mr. Frazier's affidavit, which is
15 a different exhibit, Exhibit 22.

16 THE COURT: All right.

17 BY MR. FENSTERWALD:

18 Q. One simple sentence -- (Reading) "Because of
19 distortion due to mutilation and insufficient marks of
20 value, I could draw no conclusion as to whether or not the
21 submitted bullet was fired from the submitted rifle."

22 Would you comment on that?

23 A. Well, that's one of three possible conclusions, of
24 course. Either you can identify a projectile as being fired

1 standard or test-fired cartridge will exhibit the identical
2 markings from one to the other. That's one of the three.
3 The second being that it is an impossibility that the
4 projectile could have been fired in that weapon, and the
5 third is, as apparently the affidavit states, no conclusion.

6 I feel there is sufficient detail there that with a
7 good comparison microscope and several test-firings that
8 an identification ought to be possible. I have seen several
9 fineline striations in grooves No. 1 and 5, and the mutilation
10 to the projectile is negligible from the standpoint of
11 firearms identification. It's mushroomed, but it is not
12 distorted. You have six lands and grooves to work with, not
13 just one fragment. I believe an identification is possible,
14 or could be made.

15 Q. Now, that affidavit of Mr. Frazier's was taken and
16 used on March 10th, 1968 in the following manner, and I
17 quote -- "That the death slug removed from the body contained
18 lands and grooves impressions in the direction of twists
19 consistent with those that were in the barrel of this rifle."
20 Would you comment on that statement?

21 A. Well, it is referring to class characteristics. In
22 other words, like a right shoe is a right shoe and six lands
23 and grooves to the right are six lands and grooves to the
24 right. It is consistent with a lot of revolvers that are

1 except that it could have been fired in that weapon.

2 Q. Could you give us a rough estimate of the number of
3 weapons in existence with which it would be consistent?

4 A. With six right?

5 Q. Yes.

6 A. Oh, heavens -- millions.

7 Q. It would have to be thirty caliber?

8 A. Well, there are millions of those. I am sure the
9 military has made millions.

10 MR. HAILE: I object. It's clear that he
11 has no personal knowledge.

12 THE COURT: I overrule the objection to the
13 extent of his training. Go ahead, Mr. Fensterwald.

14 MR. FENSTERWALD: Thank you, sir.

15 Q. It also says in the March 10th transcript -- (Reading)
16 "The death slug was identical in all physical characteristics
17 with the five loaded 30.06 Springfield cartridges found in
18 the bag in front of Canipes."

19 Do you know of your own knowledge whether any
20 spectrographic analysis or neutron activation analysis was
21 made in this case?

22 A. No, I do not.

23 Q. If you had been hired by the defense to work on the
24 case, would you have had that done?

1 might have. If I established conclusively the projectile
2 was fired from a given weapon, I certainly wouldn't care
3 what the spectrograph said because it could be a different
4 batch of bullets. I mean the physical match would be suffi-
5 cient in and of itself. If I got class characteristic
6 agreement, and I wanted to pursue it further for chemical
7 agreement, I would probably have a neutron activation done
8 to see if they were consistent with that batch of bullets.

9 Q. And had you been hired, would you have had the rifle
10 tests fired?

11 A. Certainly. I would have test-fired it. I wouldn't
12 have had it test-fired.

13 Q. To compare?

14 A. Yes; for getting the test slugs for comparison to
15 the evidence, projectile.

16 Q. And would you have examined the room, including the
17 windowsill, to see if it would be possible physically to fire
18 the gun from that point and put a dent in the windowsill?

19 MR. HAILE: This man is not a lawyer. I
20 assume the only reason you hire a ballistics
21 expert is to have him testify as to the gun.

22 MR. FENSTERWALD: He is an expert in
23 criminalology, Your Honor, and I think what this
24 really goes to is to the incompetence of the