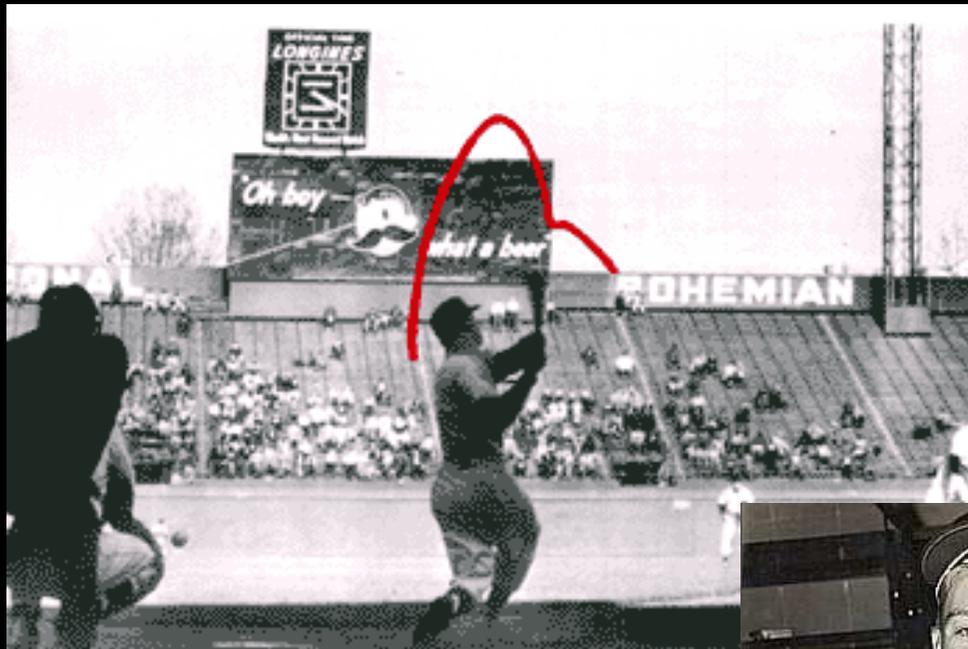


Revisiting Mantle's Griffith Stadium

Home Run, April 17, 1953

A Case Study in Forensic Physics

Alan M. Nathan



Mantle Clouts Record 562-Ft. Homer

Ball Goes Out of Park; Yanks Win, 7-3

By Joe Trivette
Washington, D. C., April 17.—Mickey Mantle, the magnificent mascot of the Yankees, today hit the longest home run in the history of baseball. The mass of muscle erupted in the park in the fifth inning and drove a pink-souped home run far into left field beyond the Bohemian. The ball flew like a rocket. The ball landed in the back seat of a motor car in the active stadium of the field. The ball was seen to hit the car. The driver, a woman, called out a warning. The ball was seen to hit the car. The driver, a woman, called out a warning. The ball was seen to hit the car. The driver, a woman, called out a warning.



Just Happin'

Just starting the season, the Yankees have to avoid from the grip of the Yankees. The Yankees have to avoid from the grip of the Yankees. The Yankees have to avoid from the grip of the Yankees.

Dreyer Puts Burton Away at 2:52 of 6th

By Gene Ward
Hendricks' pitcher Larry Dreyer, the Yankee pitcher, tonight dominated, ran the victory down to 10 straight but night before 1:20 P. M. New's late and the "Yankees" on TV.

Fight Frenzy

St. Michael's Wins Eastern Relay



An Overview:

This is a story about

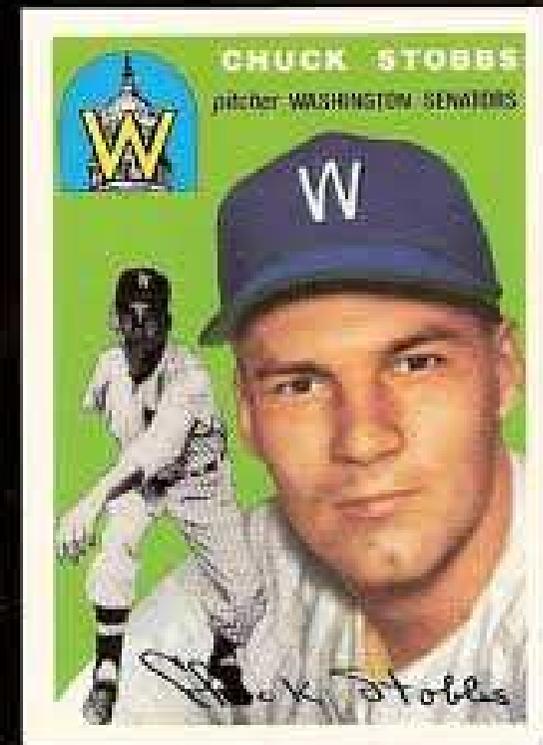
- baseball's fascination with tape-measure home runs
- the Mickey Mantle legend
- one woman's determination to separate fact from fiction
 - with help from a physicist

Here's the story

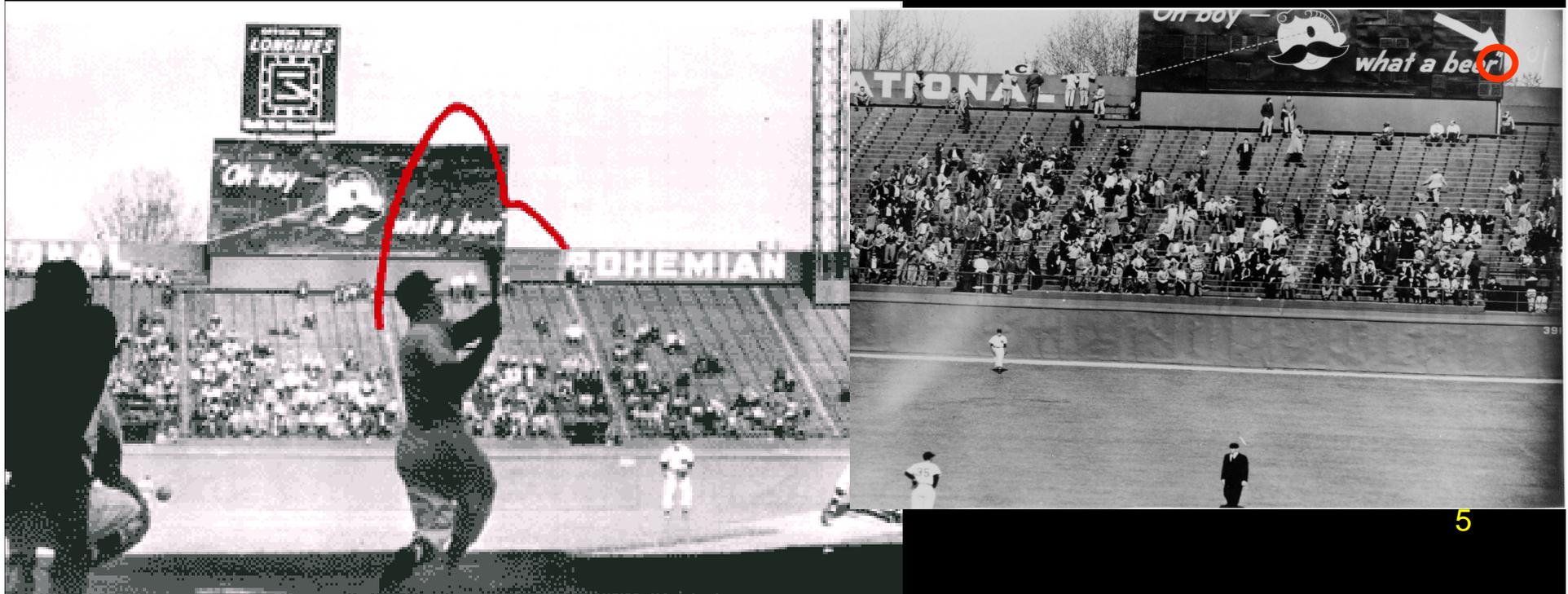
- April 17, 1953: a windy afternoon
- NY Yankees at Washington Senators
– Griffith Stadium



- 5th Inning, Berra on 1st, Mickey Mantle, batting righthanded off lefty Chuck Stobbs, hits gargantuan shot to left-center



- 5th Inning, Berra on 1st, Mickey Mantle, batting righthanded off lefty Chuck Stobbs, hits gargantuan shot to left-center
- Ball hits sign, exits stadium, enters residential neighborhood

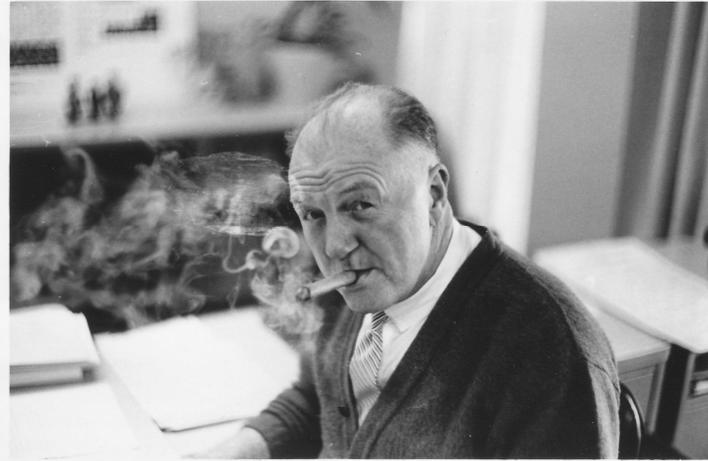
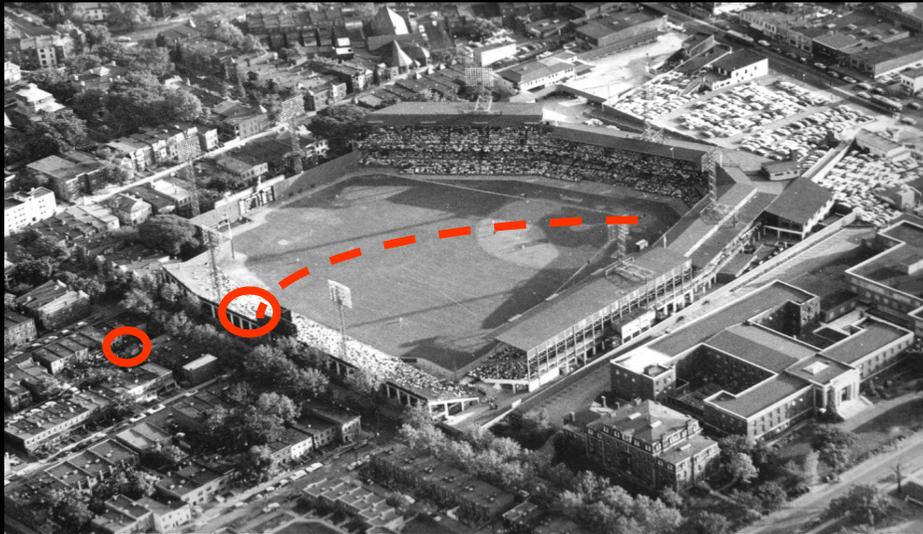


- 5th Inning, Berra on 1st, Mickey Mantle, batting righthanded off lefty Chuck Stobbs, hits gargantuan shot to left-center
- Ball hits sign, exits stadium, enters residential neighborhood
- 14-yr-old Donald Dunaway retrieves ball

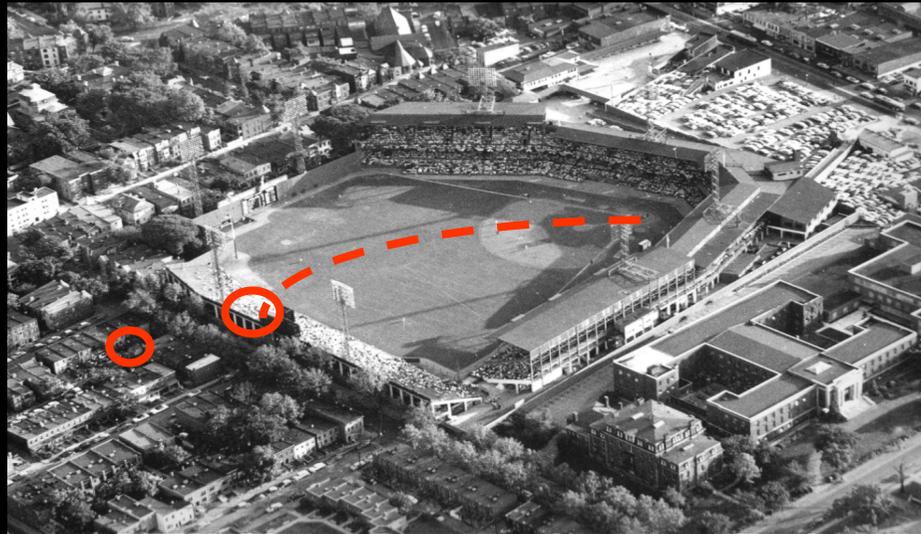


55 years later





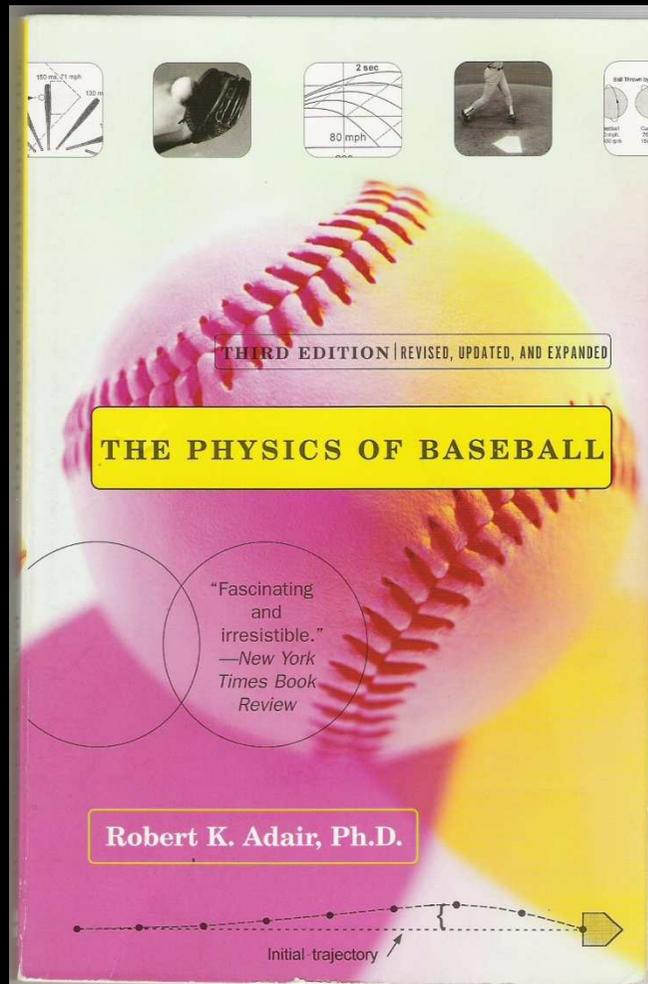
- **NYY publicist Red Patterson finds Dunaway, who shows him where he found ball behind 434 Oakwood Pl.**



- Patterson paces off distance to sign; concludes ball traveled 565 ft
- The Mantle legend and “tape measure home run” are born

What *really* happened?
How far did the ball go “on the fly”?

Baseball Physicist Bob Adair



BATTING THE BALL • 103

plate; the spot at which it hit the beer sign was 60 feet above the playing field level. In general, balls go farthest when hit at a launching angle of about 35 degrees; with a strong following wind, the optimum angle is more like 40 degrees. And—as a consequence of air resistance—a ball comes down at an angle greater than that at which it takes off. If the ball came down at an angle of 50 degrees, it would hit the ground 510 feet from home plate; a more precise calculation gives an answer of 506 feet, with an uncertainty I put at no more than 5 feet.

A probable trajectory of the ball Mantle hit is shown in Figure 5.13. It is obvious from the scale drawing that the claim of 565 feet is nonsense, but that an estimate of 506 feet is quite reasonable.

When Mantle hit Stobbs's pitch, there seems to have been a strong following wind and I'd expect that the longest home runs hit in outdoor parks are always wind-assisted. Valenti quotes Sam Diaz, a meteorologist who was working that day in the Washington Weather Bureau, to the effect that the wind during that period was 20 mph, with gusts up to 41 mph. If we take the wind as blowing out at 20 mph 60 feet above the playing field, but shielded by the stands below 60 feet, we can conclude that a ball hit that hard would carry about 430 feet on a windless day; and if the wind had been *against* Mantle, the ball would have been only a routine fly out.

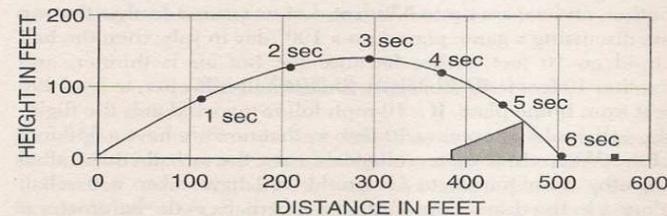
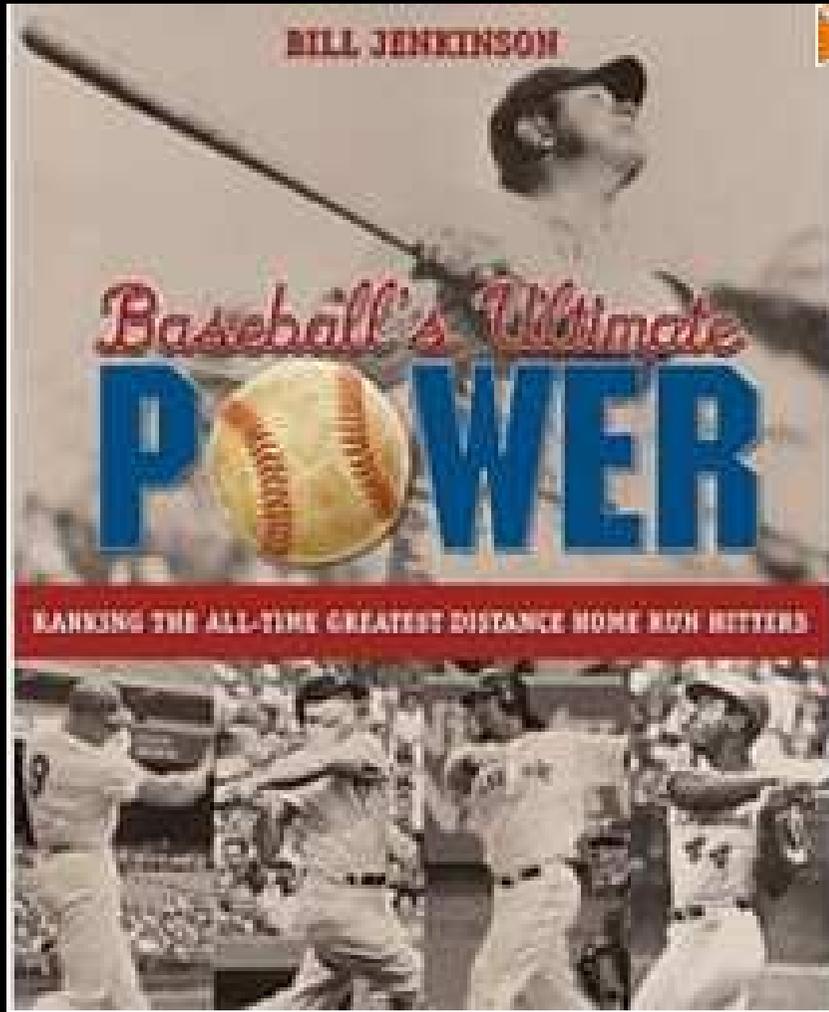


FIGURE 5.13: A plausible trajectory of the ball hit by Mickey Mantle off Chuck Stobbs that went over the left-field bleachers at Griffith Stadium. The solid square shows the distance the ball was claimed to have traveled.

Page 103:

“...a more precise calculation gives... **506 ft**, with an uncertainty ... no more than 5 ft” (!)

Baseball historian Bill Jenkinson



“So, how far did the ball actually fly? I can’t say for sure, but several physicists [not me] with whom I have consulted agree that it could not have been more than 515 feet. That’s very long indeed, but far from 565 feet.”

Some people really feel strongly about this event

- **Jeff Passan, Yahoo Sports, commenting on Jenkinson's account:**

The longest home run ever hit did not go 565 feet. Not even close.... To think the Mick hit that ball 565 feet is to think that Santa Claus exists.

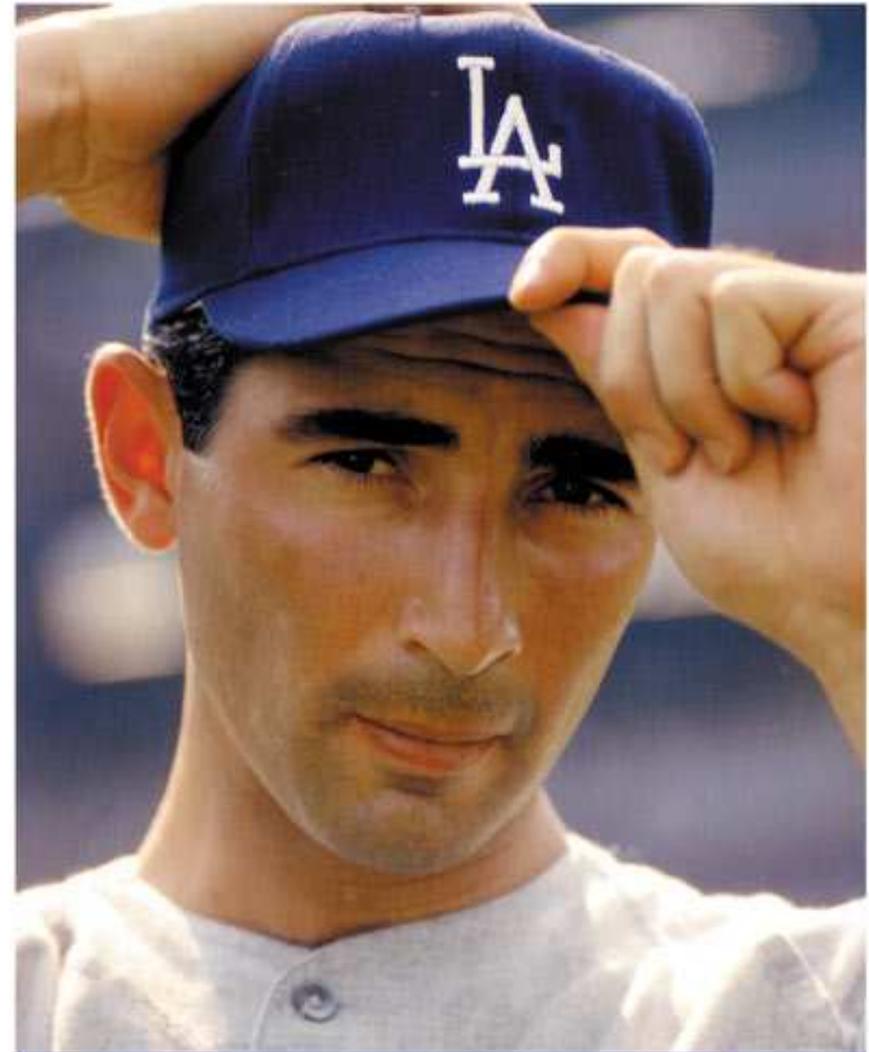
- **Randall Swearingen, mickeymantle.com, commenting on Passan**

Fifty-five years after the fact, Jeff Passan of Yahoo Sports smugly presented a stunning indictment, with help from his expert witness, author Bill Jenkinson, that the 565' blast by Mickey Mantle on April 17th, 1953 at Griffith Stadium is merely a myth and could not possibly have traveled that far.

Status as of 2008:

- The legend (Red Patterson): 565 ft
- The physicists: 505-515 ft

Enter Jane Leavy
www.janeleavy.com



Sandy Koufax

A Lefty's Legacy

Jane Leavy

Enter Jane Leavy

www.janeleavy.com



Published, October 2010

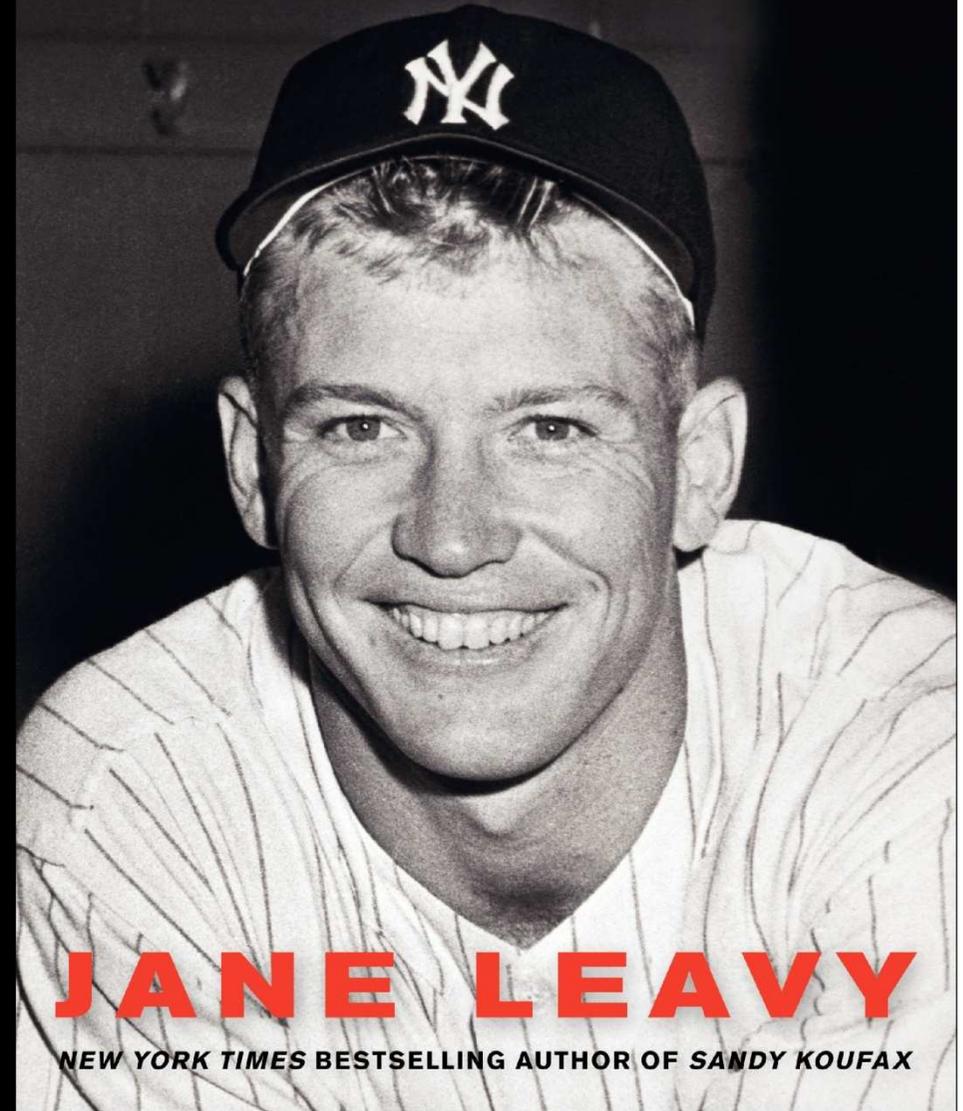
#4 NYT nonfiction

**Chapter 6:
One Big Day**

THE LAST BOY

MICKEY MANTLE

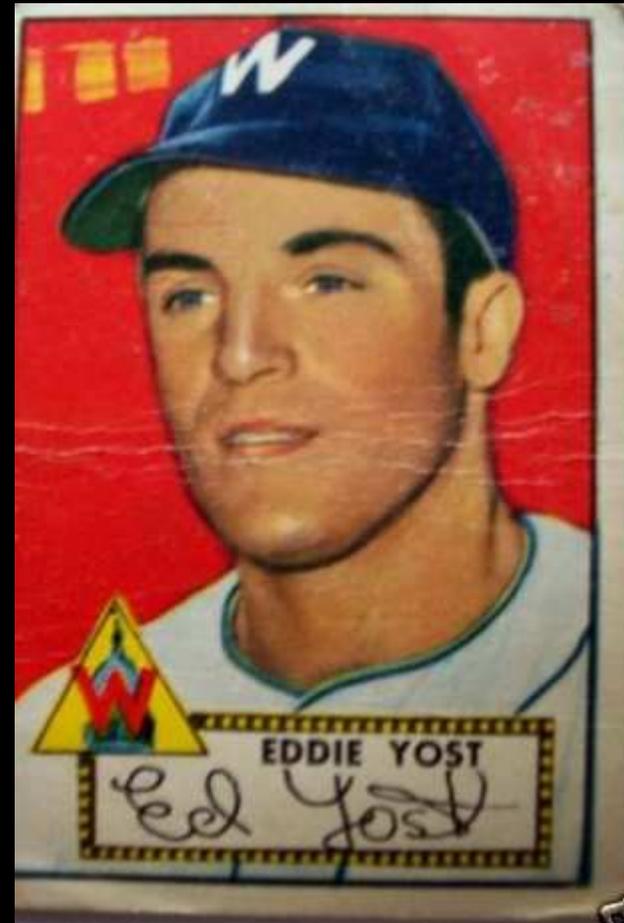
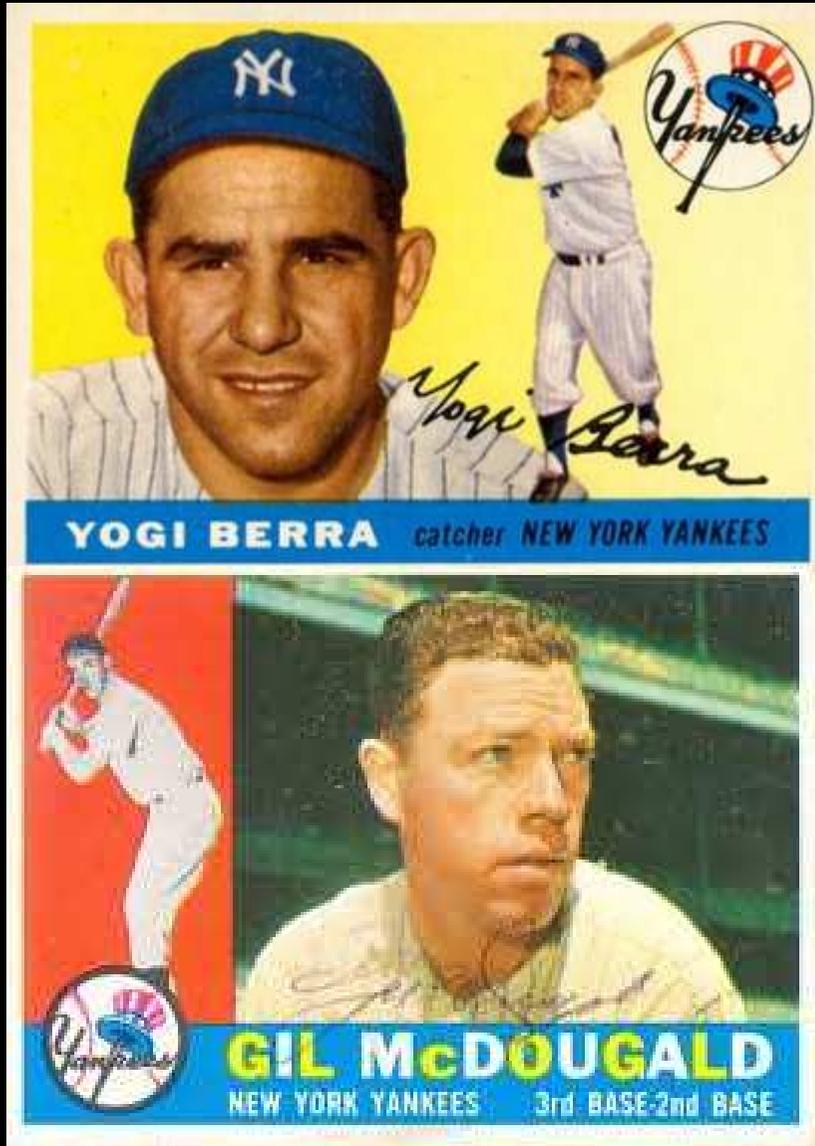
AND THE END OF AMERICA'S CHILDHOOD



JANE LEAVY

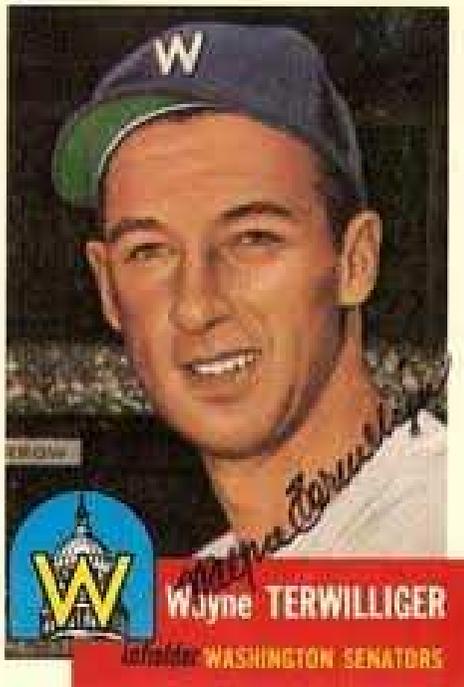
NEW YORK TIMES BESTSELLING AUTHOR OF SANDY KOUFAX

She interviewed eye-witnesses



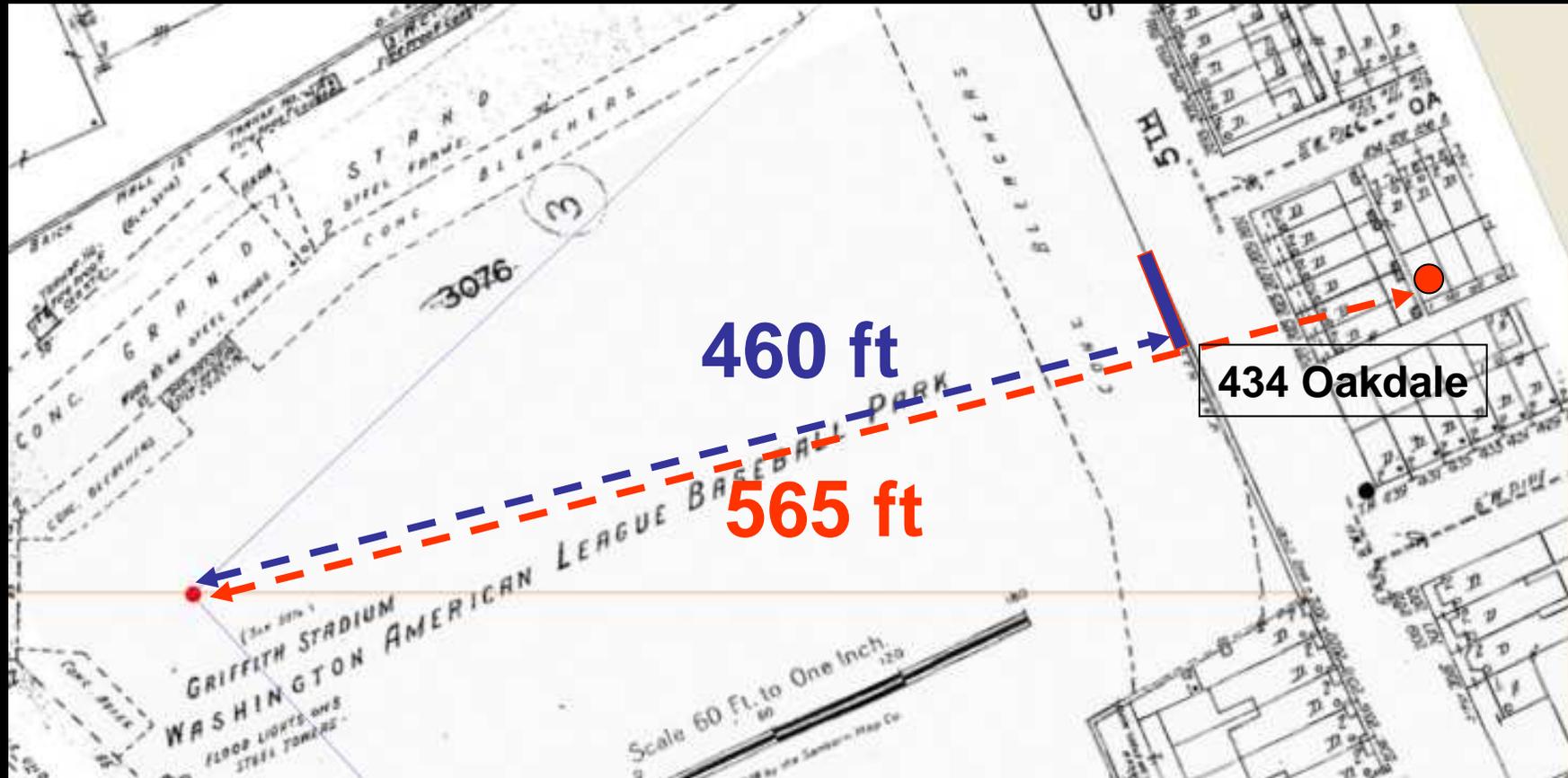
some contradictory

The ball exited the stadium so fast that Nats broadcaster Bob Wolff did not have time to raise his voice in narrative exclamation.



It was hit so high, infielder Wayne Terwilliger said that “Mantle was at second base by the time it came down.”

She researched the neighborhood



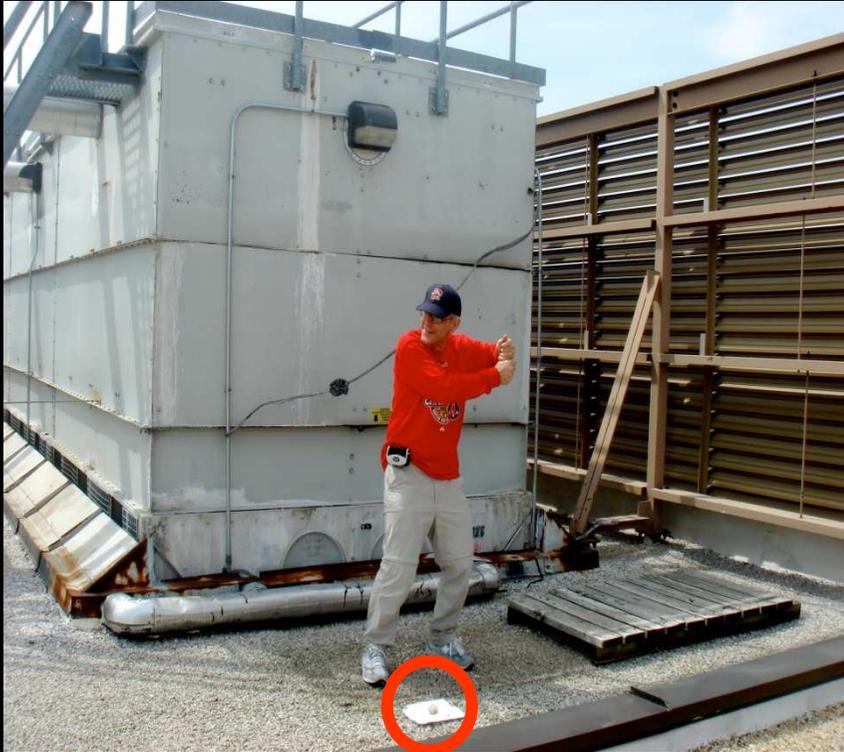
Present Day Site/Griffith Stadium



Present Day Site/Howard U. Hospital



She enlisted my help



we located home plate

we actually used a tape measure!

Atop Howard University Hospital, April '08

**...and she found the elusive
Donald Dunaway (1939-2010)**



What We Know (at least approximately)

- **Ball hit glancing blow on sign and exited the stadium**
 - 460 ft horizontal ft from home plate
 - 55-60 ft above ground level
- **Donald Dunaway retrieved ball behind row houses that face 5th St. NW**
 - at a distance of ~565 ft from home plate
- **Wind was blowing out steadily at ~20 mph**
 - with gusts up to 40 mph

What We Don't Know

- **Batted ball parameters**
 - speed, launch angle, and spin
- **How long it took batted ball to reach sign**
- **Precise wind speed and direction at time of hit**
- **Precise height where ball hit sign**
- **Where the ball landed**

What We'd Like to Know

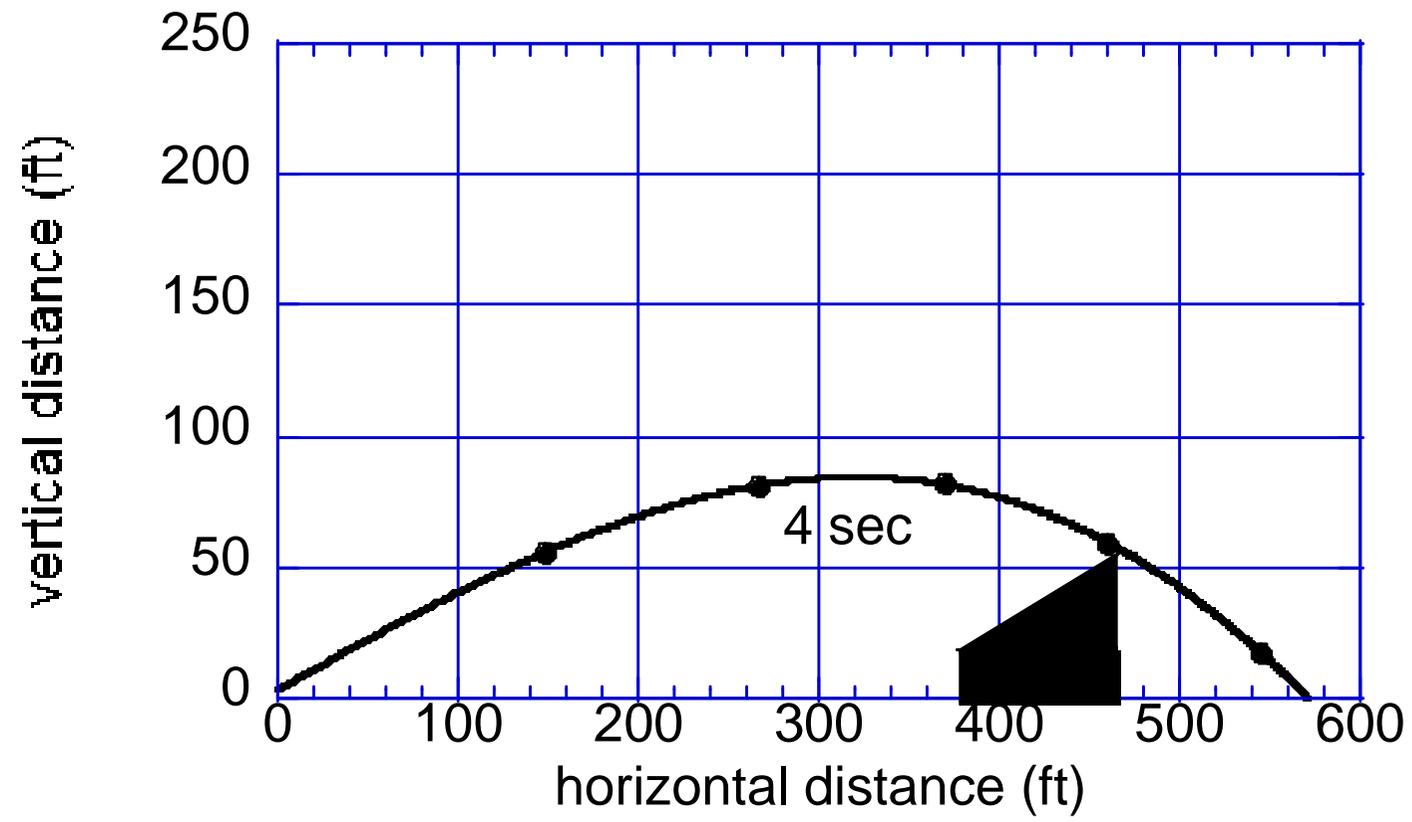
- Is there a plausible set of conditions consistent with the known facts?
 - Answer: yes, as we shall see
- Given all the uncertainties, what constraints can we place on the distance the ball would have carried unobstructed?
 - I'll tell you later

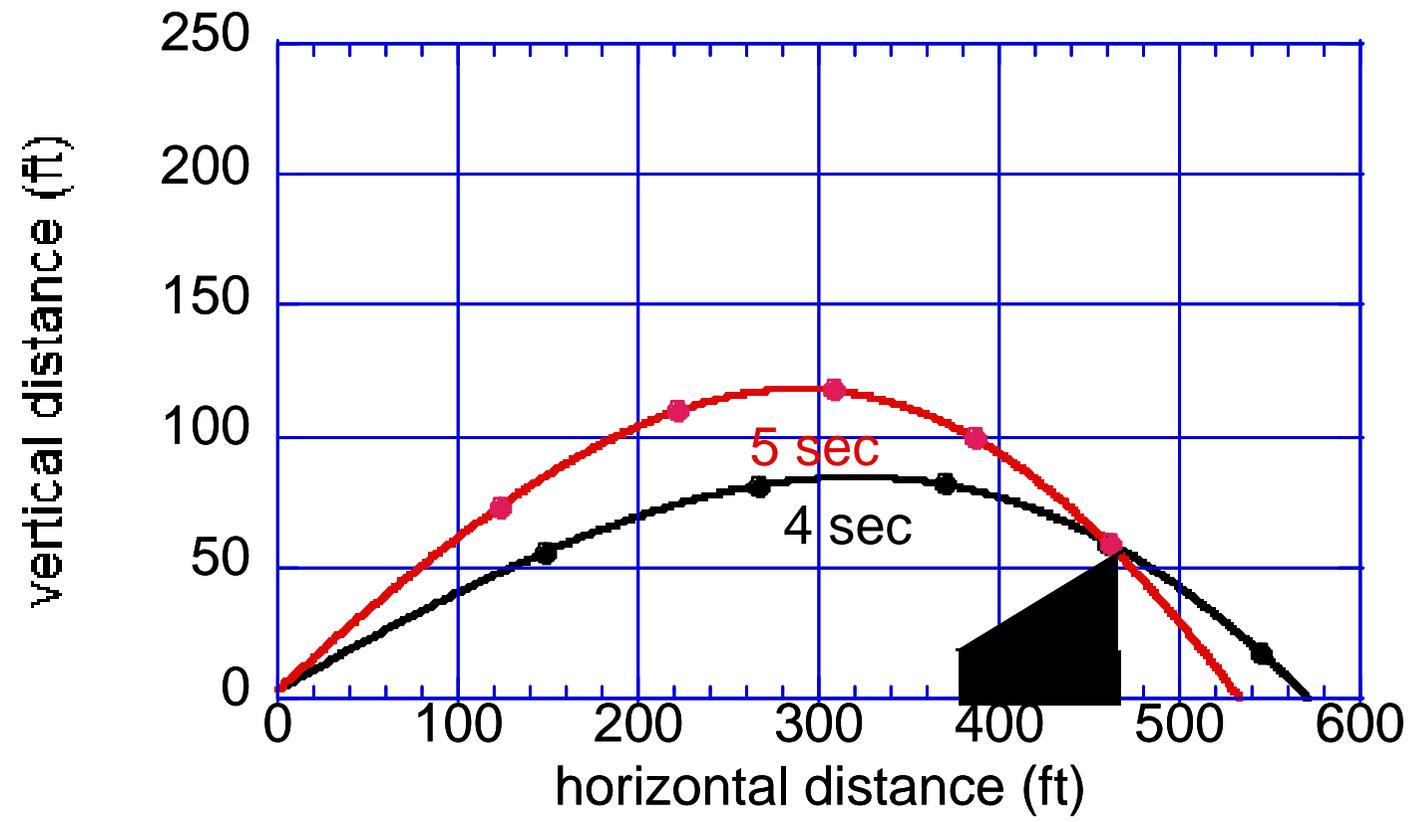
How to Constrain the Trajectory?

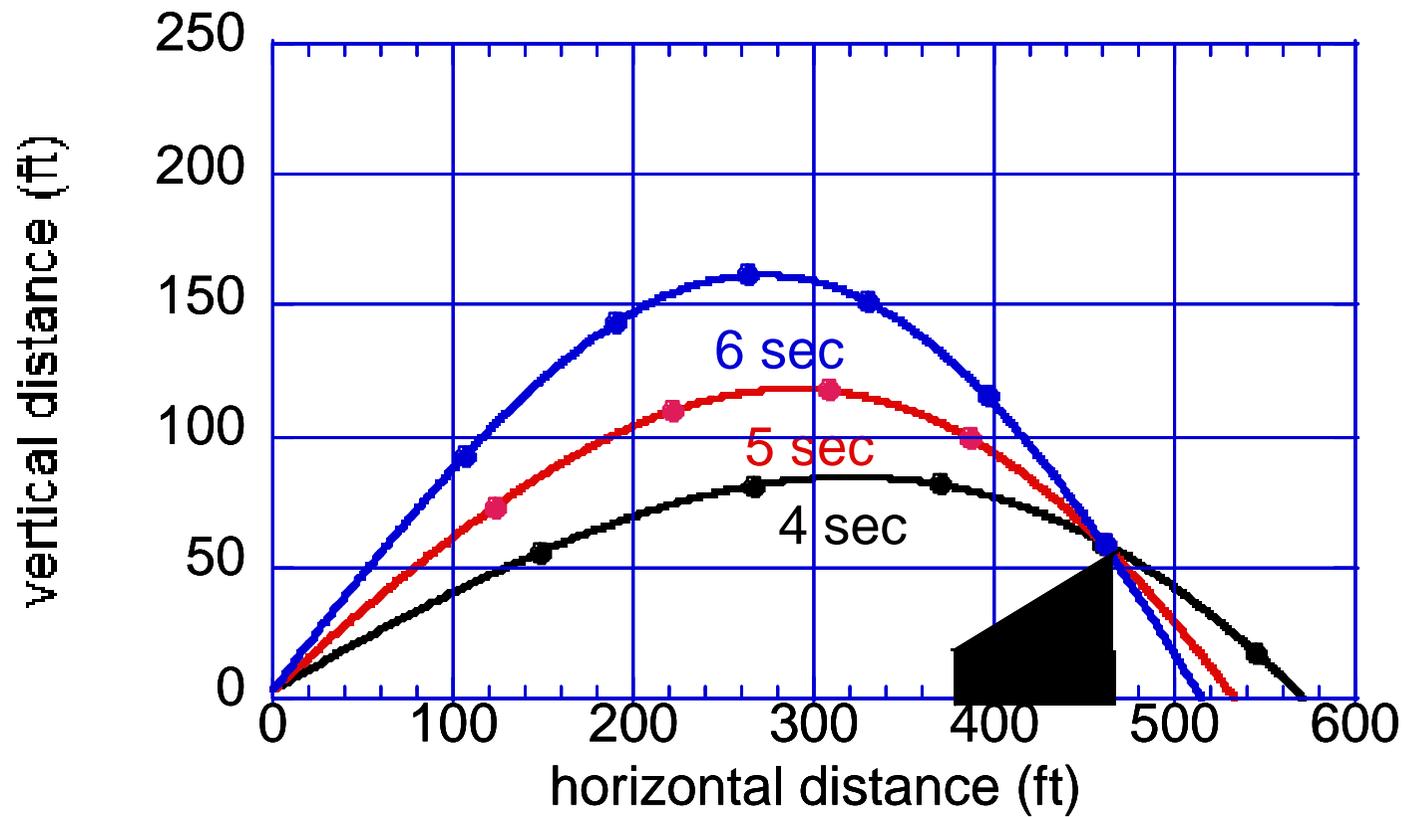
- **Ball hit beer sign**
 - 460 horizontal and 60 vertical ft. from home plate
- **Is that enough information to determine landing point**
 - ***NO!***

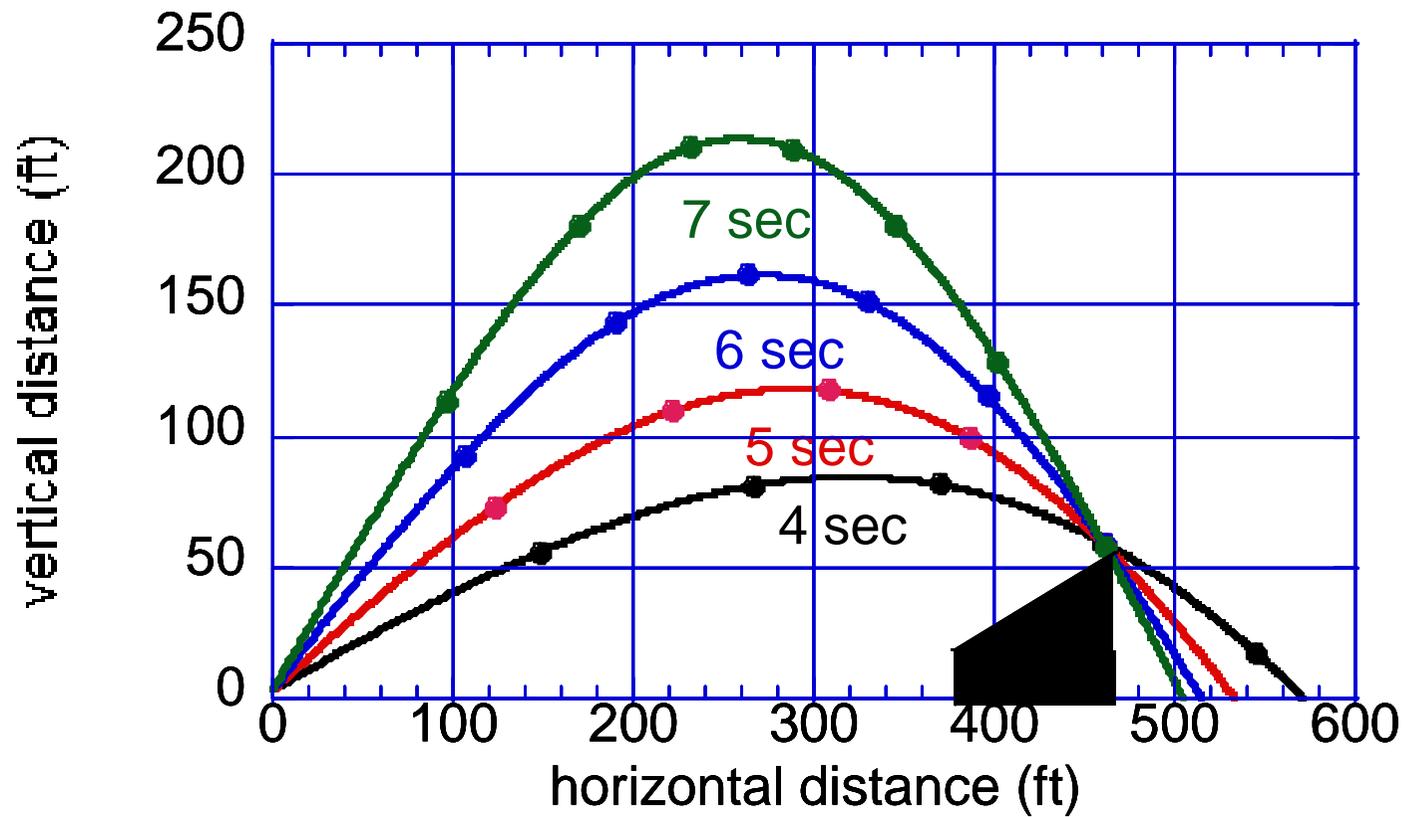
Caution: Physics Alert!

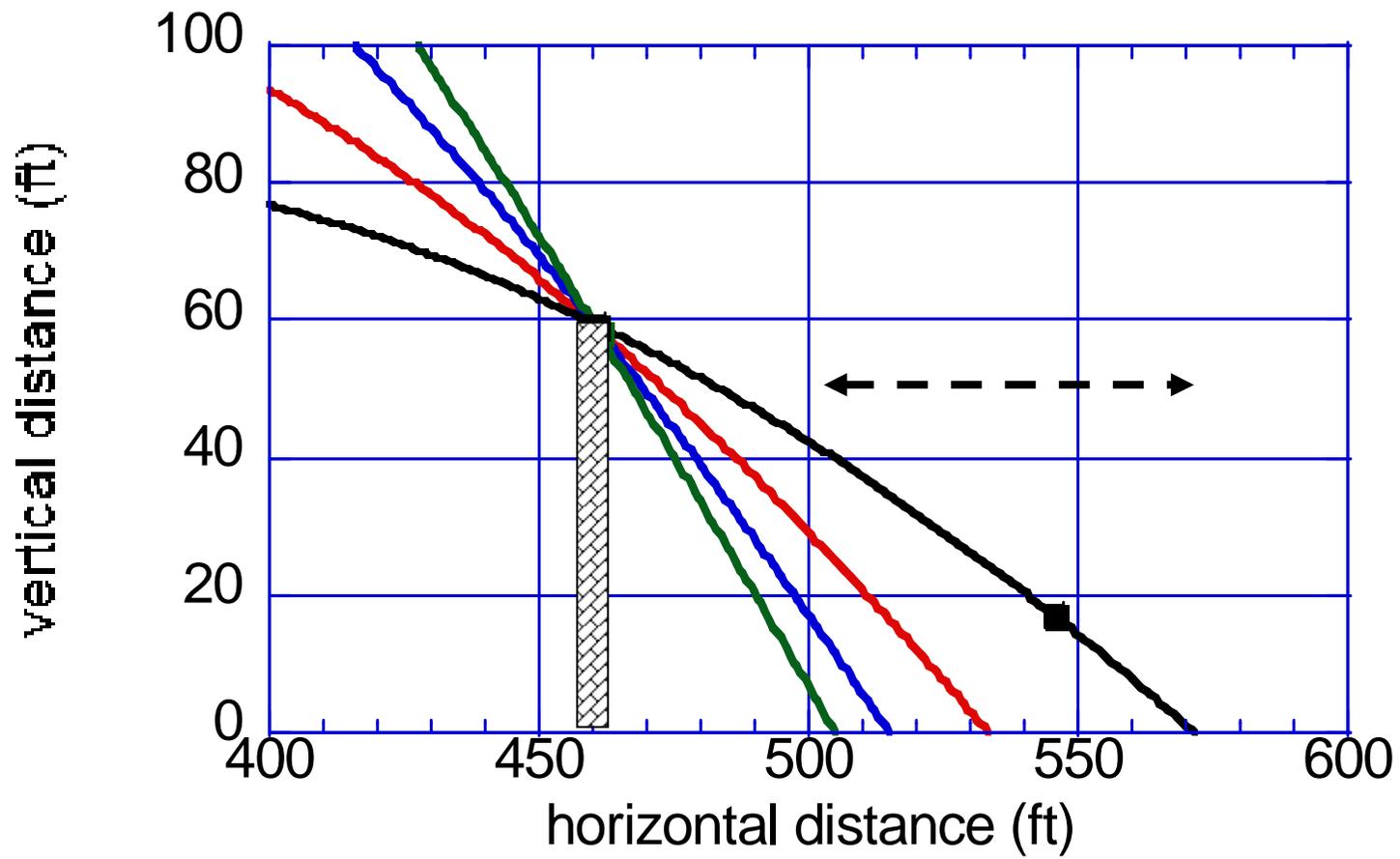
**But fear not: If you understand the
next few slides, you understand
everything**











- **We have a dilemma:**
 - Different combinations of batted ball speed and vertical launch angle are possible. Need more info to remove ambiguity
 - speed, angle, flight time, ...
 - An aside: it is not obvious how previous analyses avoided this dilemma
- **But we have one additional piece of information...**
 - Ball was retrieved behind row houses
 - ...a fact seemingly ignored in previous analyses
 - ...and one leading to considerably longer distance

..but not ignored in contemporary accounts

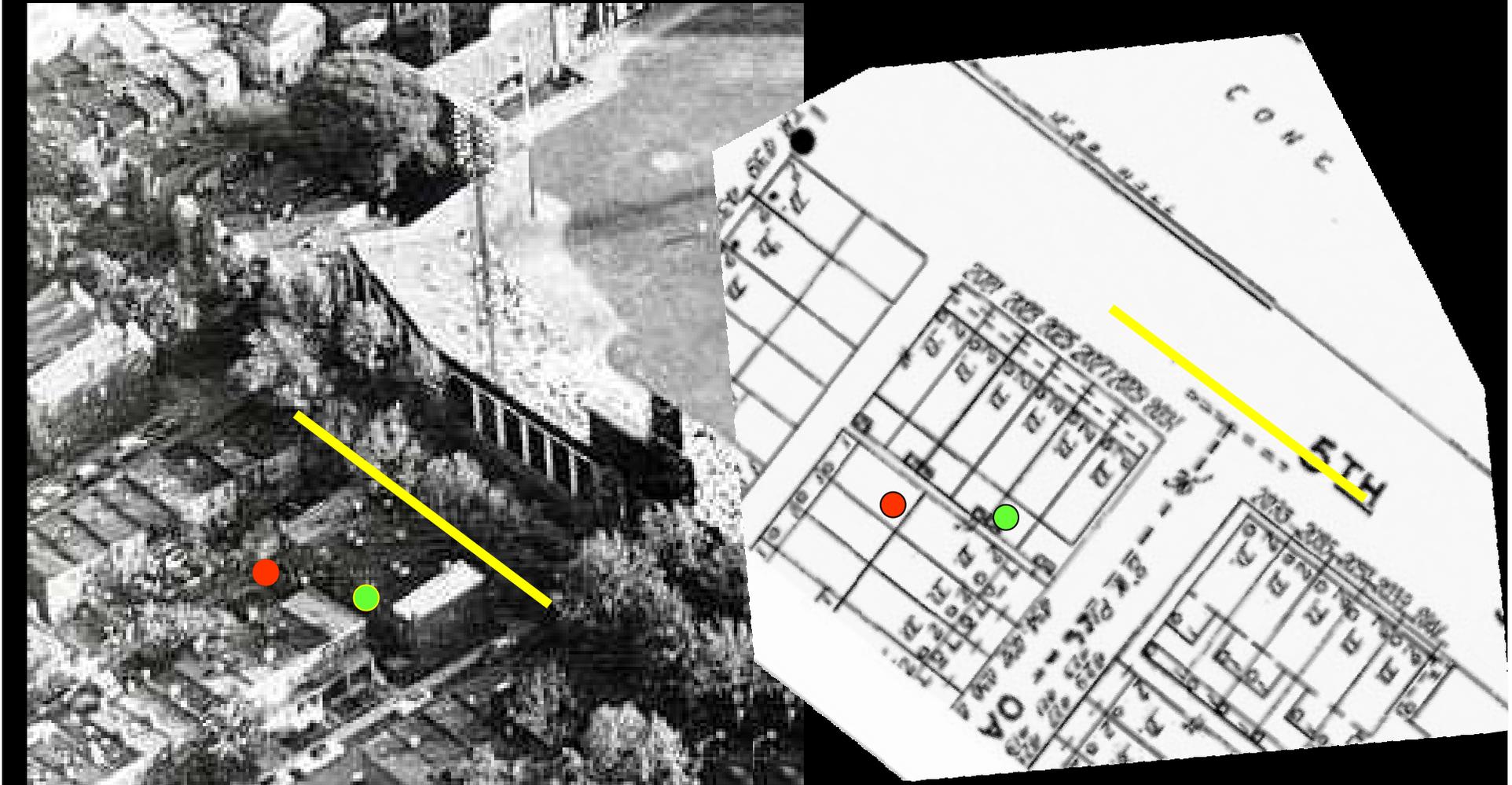
From Louis Effrat, NYT

April 19, 1953

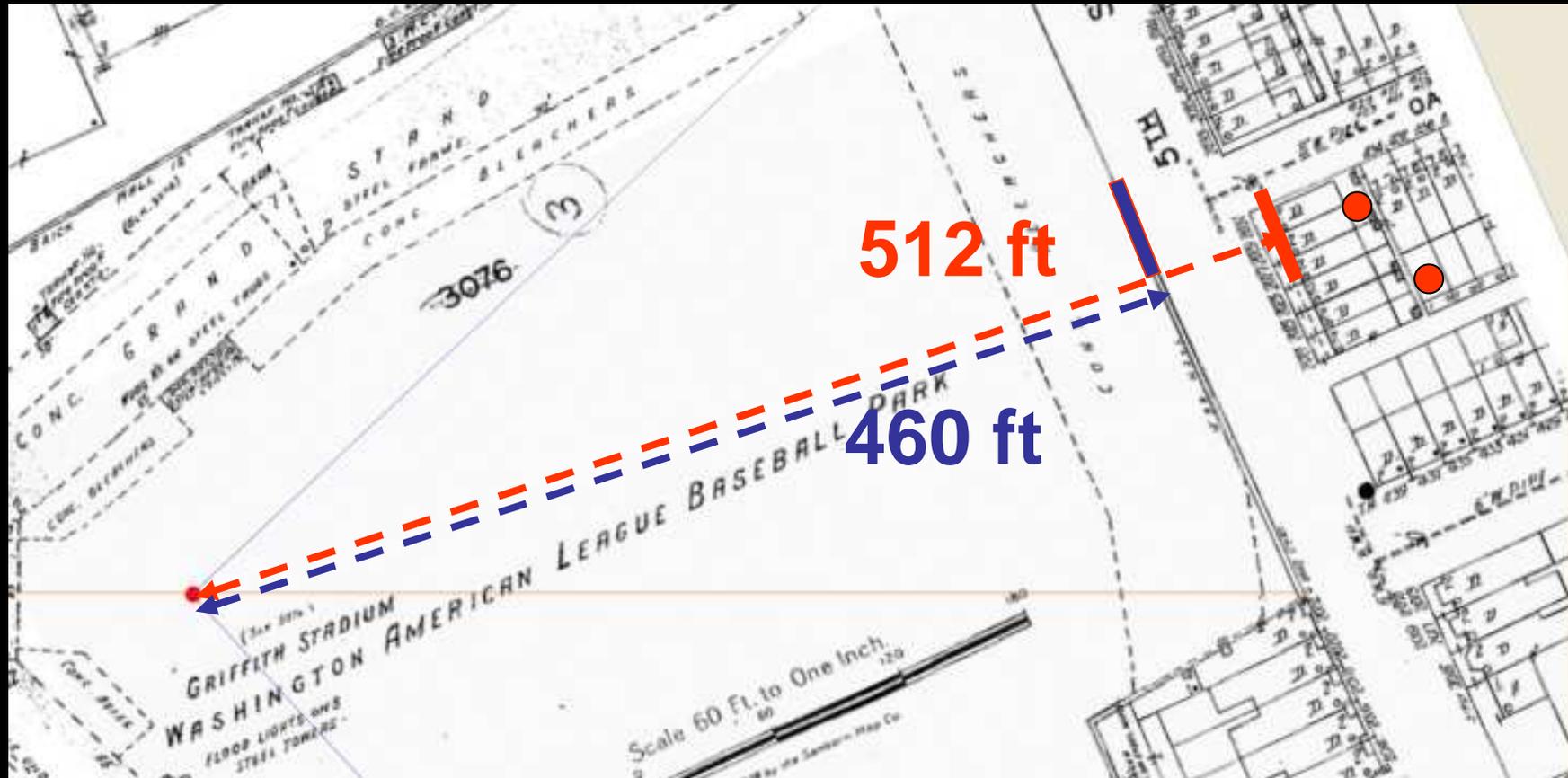
From home plate to the spot where the ball hit measures 460 feet. It was estimated that the ball came to rest 105 feet farther back and to get there, it could not have bounced in the street immediately outside the park. It is unlikely that the ball could have bounced high enough first to clear a two-story building, behind which it was picked up by a 10-year-old lad, who sold it to Patterson.

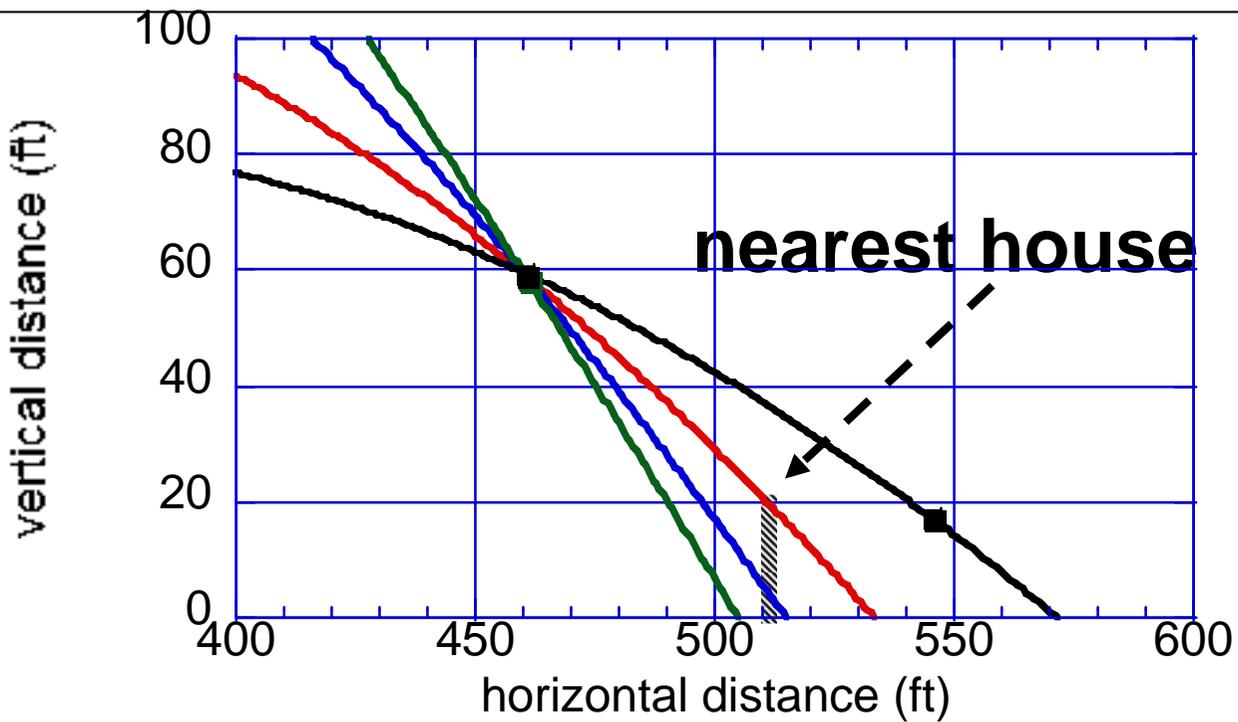
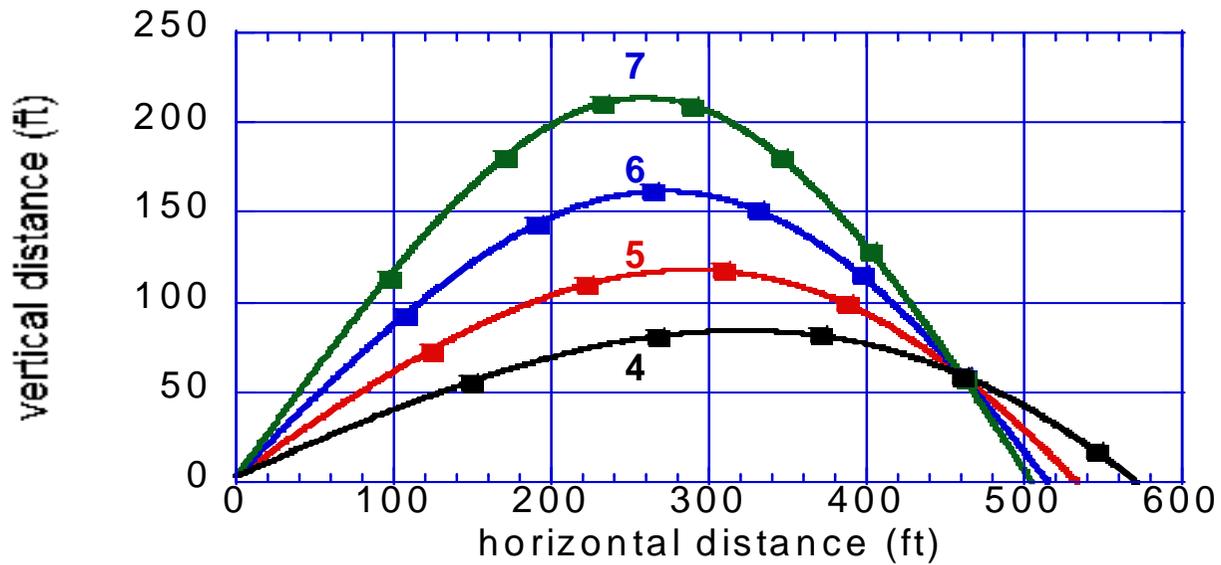
Louis Effrat. "Mantle Homer Hit Into Hall of Fame; Cooperstown Shrine Will Get Ball and Bat Used by Yanks in Wallop at Capital." New York Times. 19 April 1953, p. S1.

- Dunaway now says he retrieved the ball behind the houses facing 5th St. (houses no longer there!)
- Nearest house 512' from home plate with roof 22' high



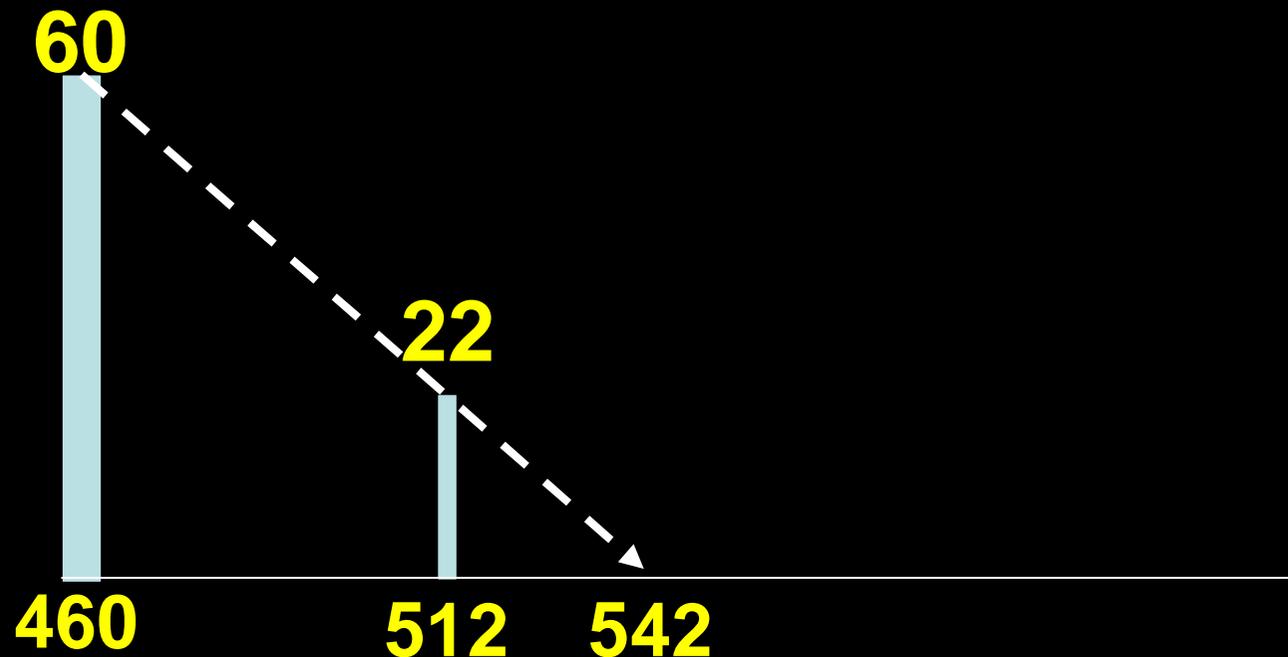
Sanborn Map of Area





Some Simple Geometry

- If ball hits sign and just clears roof, straight line gives distance as 542 ft
 - More precise calculation gives 535 ft
- Therefore actual distance is ≥ 535 ft



Some Conclusions

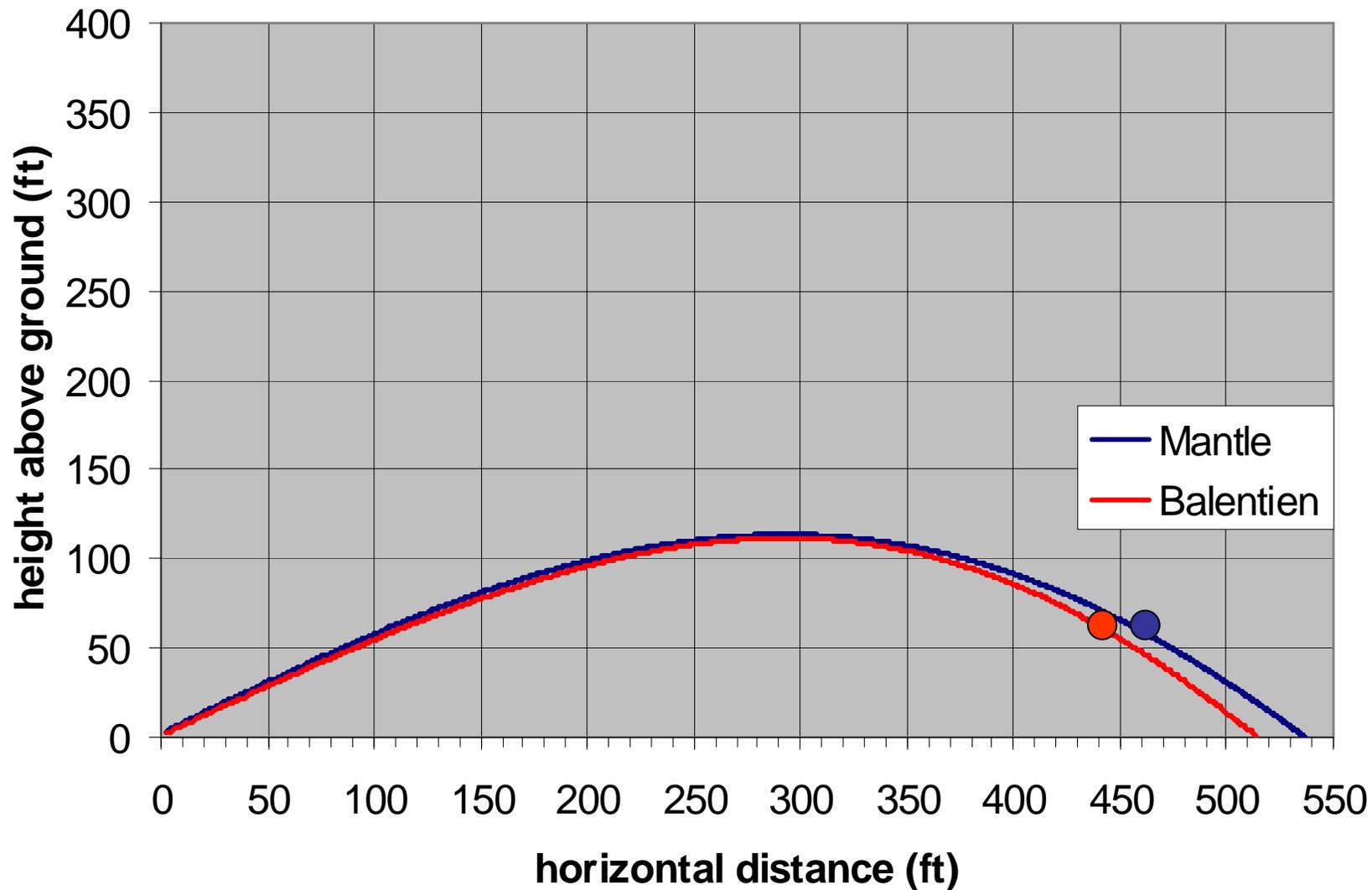
- Analysis shows hitting 5th St. and bouncing onto or over roof not a credible option
- Ball going over roof constrains the trajectory:
 - Launch Angle $< 31^{\circ}$
 - Batted Ball Speed > 113 mph
 - Distance > 535 ft (!)
 - this limit insensitive to unknown details
 - distance could have been farther
- Is this result credible?
 - Yes: it is nearly identical to a home run hit in 2009

Vladimir Balentien vs. Mickey Mantle

	Balentien	Mantle
speed	112.5 mph	113.3 mph
Angle	29 ⁰	31 ⁰
D	442 ft	460 ft
H	62 ft	60 ft
Wind	15 mph	20 mph
Distance	517 ft	535 ft

very similar trajectories!

Balentien vs. Mantle



Final Remarks

- A plausible scenario for the HR exists
- Distance is significantly longer than previously thought
 - at least 535 ft
 - no easy way to establish an upper limit
- And it was aided considerably by the wind
 - 460 ft w/o the wind
 - which is still a very long drive
- Thanks to Jane Leavy for a very enjoyable collaboration!

- Thanks for your attention
- Questions & Comments:
 - a-nathan@illinois.edu
 - go.illinois.edu/physicsofbaseball
- Enjoy the concert!

