What is science?

Procedure for study

Largely independent of topic under investigation
“There are no such things as applied sciences, only applications of science.”

- Louis Pasteur
Key Features of Science

Definition of questions

Proper criteria for evaluation
"Nothing in Biology Makes Sense Except in the Light of Evolution."

- Theodosius Dobzhansky
Heliocentric theory of Copernicus
Heliocentrism explains:

Changing of seasons
Day-length variation during year
Apparent retrograde motion of planets
Prediction of eclipses
Carl Linnaeus

Alexander von Humboldt
Evolution as Historical Science

Intermediate fossils confirm historical prediction
Baseball Research as Historical Science

Is batting average the best measure of batter effectiveness?

- Reaching base (on-base average)
- Runner advancement (slugging average)
- Combination as OPS (on-base plus slugging)
Runs per Game vs. Batting Average

$r^2 = 0.69$
$n = 2316$

OPS (On base plus Slugging) vs. Runs per Game

$r^2 = 0.86$
$n = 2316$
Sabermetrics

SABR

Society for American Baseball Research
Sabermetric Studies

Break-even point for caught stealing

Importance of a first pitch strike

Myth of clutch hitting
STATS, Inc.
Founded by Dick Cramer

Began with baseball, now all sports

Early clients:
    Chicago White Sox
    Oakland A’s

Many teams now use Sabermetrics routinely, notably the Boston Red Sox
www.retrosheet.org

165,000 of 185,000 games since 1901

Play by play data:
Collection, digitization and publication
Leading to a variety of Sabermetric analyses
Sold in this Park is Aristocrat ICE CREAM during the Game
Made by PHILADELPHIA DAIRY PRODUCTS CO., INC.

| NEW YORK | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | AB | R | HR | SH | B | PO | A | E |
|----------|---|---|---|---|---|---|---|---|---|----|----|---|---|---|---|---|---|---|---|
| J. Moore, lf. | F-4 | H | K | F-7 | F | E | H | F-2 | 2 | 2 | 6 | 3 | 0 | 5 | 0 | 0 |
| Bartell, cc. | F-6 | E | F | F-8 | X | A | R | F | C | 6 | 3 | 0 | 3 | 0 | 0 |
| Ripple, rf. | F | E | F-6 | X | A | R | F | C | 6 | 3 | 0 | 3 | 0 | 0 |
| Ott, sb. | F | E | F-6 | X | A | R | F | C | 6 | 3 | 0 | 3 | 0 | 0 |
| Berger, cf. | F-3 | 2 | 3 | 6 | 3 | 0 | 5 | 0 | 0 |
| Leiber, cf. | F-3 | 2 | 3 | 6 | 3 | 0 | 5 | 0 | 0 |
| Leslie, lb. | F-3 | 2 | 3 | 6 | 3 | 0 | 5 | 0 | 0 |
| Whiteh'd, 2b | F-3 | 2 | 3 | 6 | 3 | 0 | 5 | 0 | 0 |
| Maneuso, c. | F-3 | 2 | 3 | 6 | 3 | 0 | 5 | 0 | 0 |
| Danning, c. | F-3 | 2 | 3 | 6 | 3 | 0 | 5 | 0 | 0 |
| Hubbell, p. | F-3 | 2 | 3 | 6 | 3 | 0 | 5 | 0 | 0 |
| Baker, p. | F-3 | 2 | 3 | 6 | 3 | 0 | 5 | 0 | 0 |
| Castlem'n, p. | F-3 | 2 | 3 | 6 | 3 | 0 | 5 | 0 | 0 |
| Melton, p. | F-3 | 2 | 3 | 6 | 3 | 0 | 5 | 0 | 0 |

“GET A LIFT WITH A CAMEL”

COSTLIER TOBACCO
"$Dodgers manager Leo Durocher suspended for the 1947 season for associating with known gamblers; coach Clyde Sukeforth managed the team for the first two games; debut for Jackie Robinson; debut for umpire Artie Gore"
Retrosheet data base

Collection and computerization

Verification

Analysis