

Science In Sports

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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

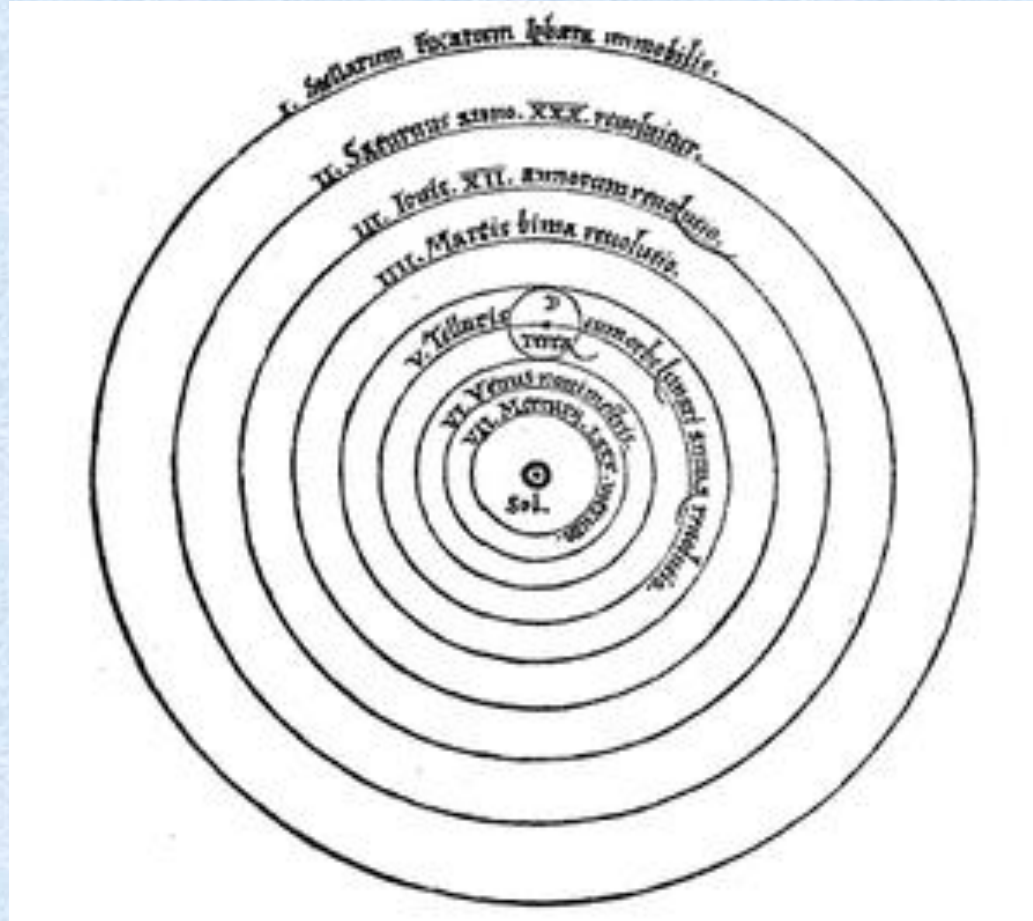
Definition of questions

Proper criteria for evaluation

"Nothing in Biology Makes Sense
Except in the Light of Evolution."

- *Theodosius Dobzhansky*

Heliocentric theory of Copernicus



Heliocentrism explains:

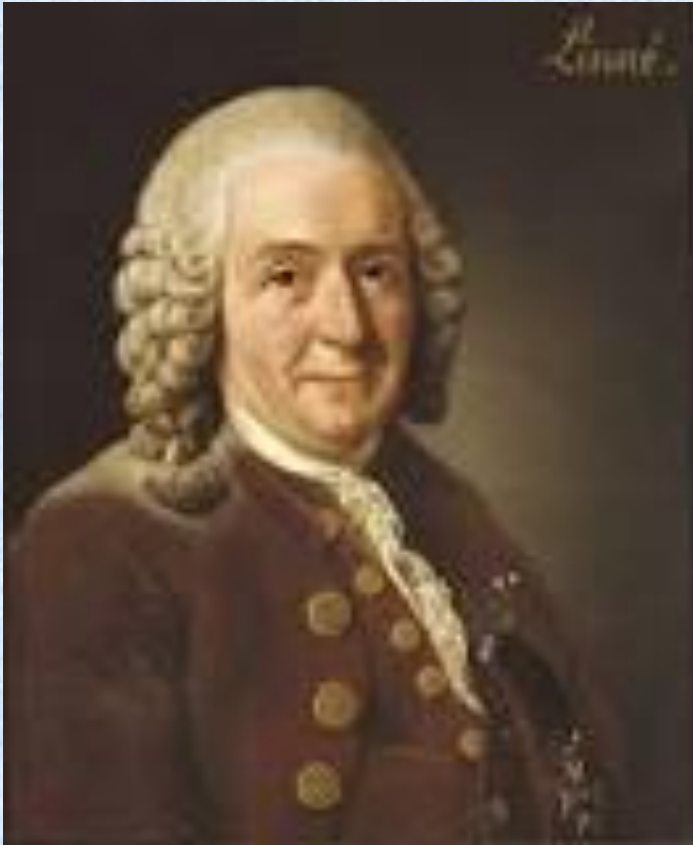
Changing of seasons

Day-length variation during year

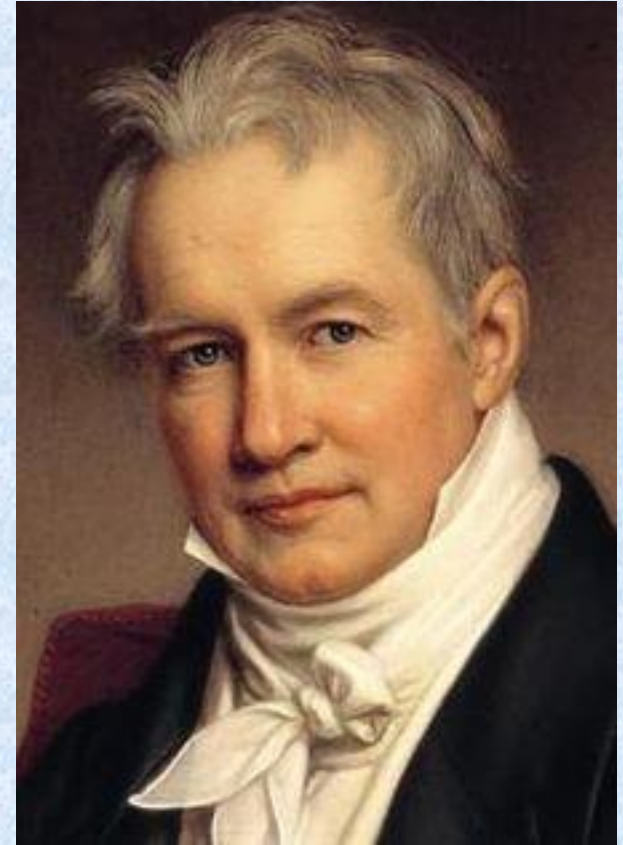
Apparent retrograde motion of planets

Prediction of eclipses

Carl Linnaeus



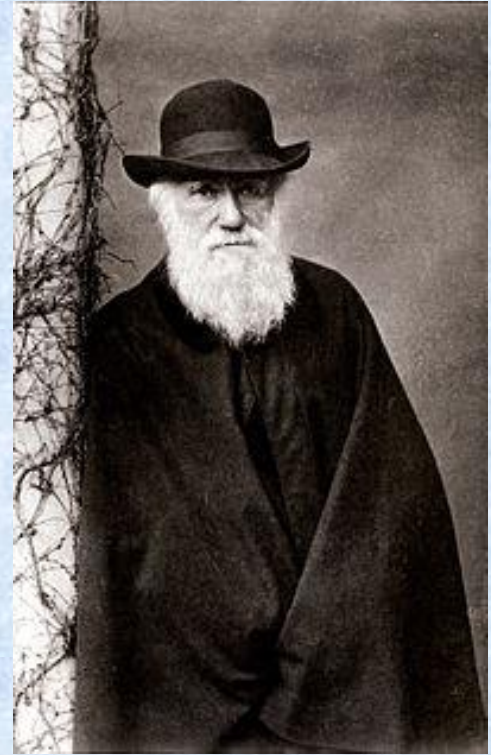
**Alexander
von Humboldt**



Charles Darwin

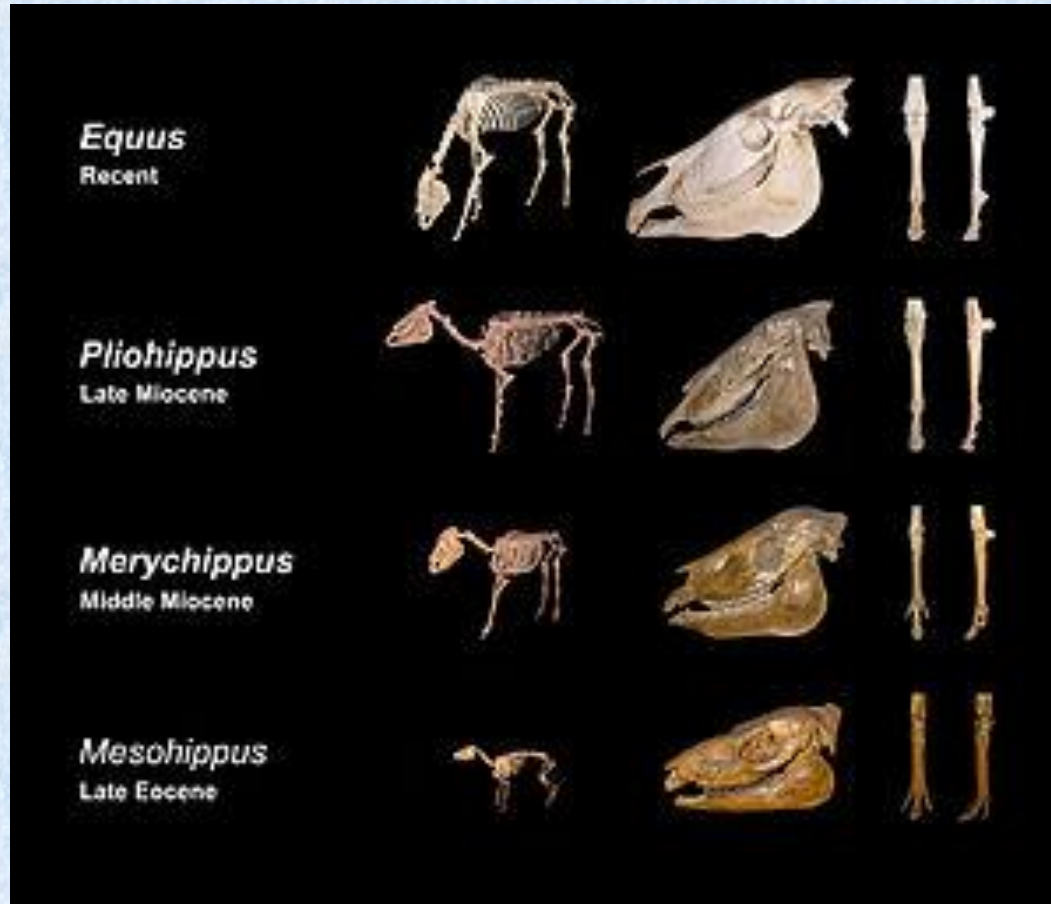


1838



1881

Evolution as Historical Science



Intermediate fossils confirm historical prediction

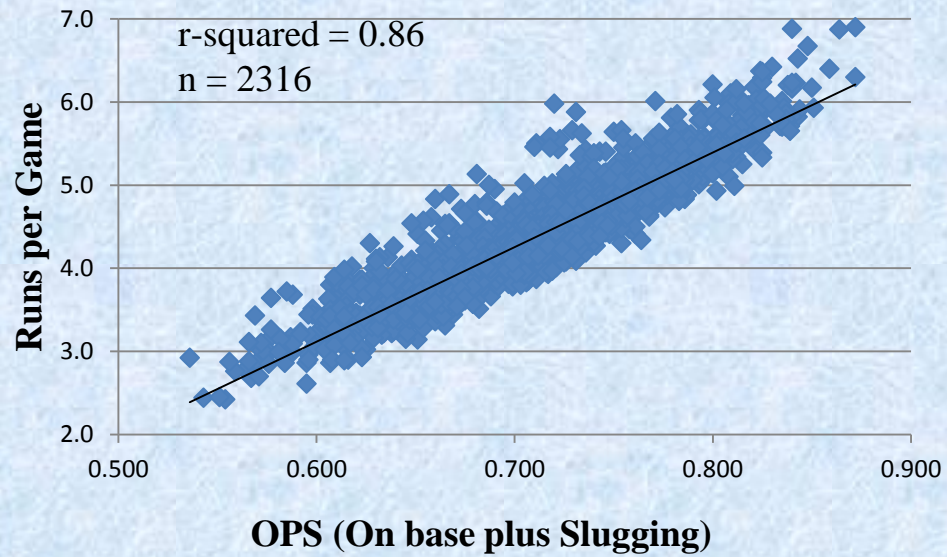
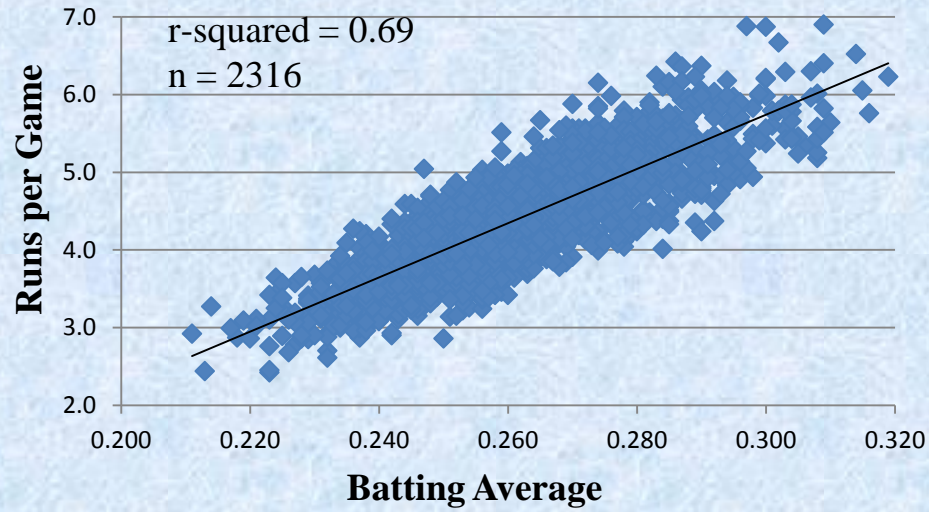
Baseball Research as Historical Science

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)



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



THE SUN

MTSUBISHI ELECTRIC

WASHINGTON NATIONALS

2	CF	DENARD SPAN	.271	1-4
33	RF	ROGER BERNADINA	.149	1-4
11	3B	RYAN ZIMMERMAN	.298	3-4
25	1B	ADAM LAROCHE	.246	1-2
20	SS	IAN DESMOND	.262	1-2
12	LF	TYLER MOORE	.151	0-3
18	DH	CHAD TRACY	.174	0-3
24	C	KURT SUZUKI	.250	0-3
8	2B	DANNY ESPINOSA	.167	1-3
36	RHP	TYLER CLIPPARD		

BALTIMORE ORIOLES

9	LF	NATE MCLOUTH	.289	1-4
13	3B	MANNY MACHADO	.333	1-4
21	RF	NICK MARKAKIS	.303	2-4
10	CF	ADAM JONES	.313	0-4
19	1B	CHRIS DAVIS	.359	4-4
32	C	MATT WIETERS	.246	1-3
2	SS	J.J. HARDY	.246	0-3
3	2B	RYAN FLAHERTY	.151	2-3
28	DH	STEVE PEARCE	.233	1-2
52	RHP	STEVE JOHNSON		

	1	2	3	4	5	6	7	8	9	R	H	E	LOB	BALLS	STRIKES	OUTS
NATIONALS	1	0	0	2	3	0	0			6	8	0	3	0	0	1
ORIOLES	0	1	0	1	0	1	6			9	12	1	4	0	0	1

MPG MVP

Go Further

MidAtlanticFordDealers.com

MATT WIETERS #32

1 for 3
Single, Flyout, Foulout

AB	175	HR	7
AVG	.246	RBI	31
H	43	OBP	.310
BB	18	SLG	.440

PNC

STRENGTH

INTEGRITY

PERFORMANCE



RETROSHEET

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

58 N. 4th Street



"Luckies along fine my throat"



N'S CAFE
Huntingdon Sts.
THE PHILLIES"

Sold in this Park is **Aristocrat** ICE CREAM during the Game
Made by PHILADELPHIA DAIRY PRODUCTS CO., INC.

10 Gumbert	17 Schumacher	1 Chiozza	19 Brennan	32 Snyder (coach)
14 Coffman	18 Smith	6 McCarthy	30 Terry (mgr.)	
	25 Madjeski	22 Ryan	51 Luque (coach)	

NEW YORK	1	2	3	4	5	6	7	8	9	10	AB	R	1B	S	H	P	O	A	E
5 J. Moore, lf.	2-0	FC		F-4	H		4-3		FC				6	3	0	0	5	0	0
2 Bartell, ss.	F	R	F-7	F			H-3	2	BB	R			4	2	3	0	2	3	0
23 Ripple, rf.	F	R	F	F-8	BB		BB		E				4	3	3	0	0	0	0
4 Ott, 3b.	F	R	F-8	X-2	BB		FC		H				3	0	0	0	1	0	0
3 Berger, cf.	K		F-6		T-2				F	0			6	2	4	0	2	0	0
26 Leiber, cf.	6-3		FC		BB	R	H-6		4-6	3			5	2	1	0	5	2	0
20 Leslie, lb.	BB		E		T	R							5	1	5	0	7	0	0
7 White'd, 2b	1-4	3		6-3			5-4		FC	F-9			6	0	1	1	3	3	0
8 Mancuso, c.							5-3						5	0	4	0	1	0	0
9 Danning, c.																			
11 Hubbell, p.																			
12 Baker, p.																			
15 Castlem'n, p.	3	3	1	2	0	1	0	1	4	4	0	3	0	0	0	2	5	6	
16 Melton, p.													4	5	1	3	2	1	3

"GET A LIFT WITH A CAMEL"

COSTLIER



Why the M that g rich HA

PHILADELPHIA
Guaran Long-filler

com,"\$Dodgers manager Leo Durocher suspended for the 1947 season for associating"
com,"with known gamblers; coach Clyde Sukeforth managed the team for the first"
com,"two games; debut for Jackie Robinson; debut for umpire Artie Gore"

play,1,0,culld101,??,,53

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Retrosheet data base

Collection and computerization

Verification

Analysis