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The hand-tinted photo on the front cover shows Hank Greenberg of the Tigers sliding safely into second base in game 4 of the 1940 World Series. Eddie Joost of the Reds has the ball. Ormsby is the umpire and the Reds second baseman Bill Myers is in foreground. Photo courtesy of George Michael.

The "longest game" scorecard photo on the back cover is courtesy of *The Providence Journal*.

Editor's Note

Even more than the typical issue of BRJ, this one seems to reflect the passions of several contributors: Herm Krabbenhoft on leadoff home run hitters; Phil Lowry on marathon games; and George Michael on sliding photographs. Any one of these writers could have filled an entire publication discussing these subjects, but their articles give you a sampling of their favorite topics. Herm has written several essays approaching his subject from different angles, and he is an expert on the topic. Phil's is the longest piece we have offered during my stay as the publications director, and even with this, the reader will have to log onto sabr.org for all of the references. George has been collecting sliding photographs for more than 50 years, and he has amassed more photos of Ty Cobb stealing home, for instance, than are at the Hall of Fame. The methods he uses to identify photographs makes for fascinating reading.

Any BRJ with an article by Bill James is a good journal, and Bill gives us a thoughtful and literate essay that every reader will want to consider. David Reed presents an insightful conversation recorded in the 1980s with the late Larry Ritter that serves as a memorial to the man who invented the recorded interview with old baseball players. Larry, a longtime SABR member, led the way for a number of researchers to follow and record a precious baseball legacy.

I will be glad when Trent McCotter graduates so I don't have to keep marveling at the research and analytic abilities of this young high schooler, whose work I've read in the Records Committee's newsletter for several years. I can then think of him as just another smart college student—and still be impressed.

Dave Smith, Jerry Nechal, and Ron Selter have written articles that will be welcomed by the historians, while Bob Boynton, Jean-Pierre Caillault, and Fred Worth present essays to appeal to the statisticians. Charlie Bevis lays out the evolution of doubleheaders, and it is a great piece of research. Along with the other fine pieces within, there is something for everyone.

Jim Charlton

A Chronology of the Best Leadoff Home Run Hitters

Undoubtedly, the best beginning (from the batting team's perspective) to a baseball game is when the leadoff batter belts a home run. While the result is "only" one run, it is an instantaneous run which gives the batting team an immediate opportunity to win the game—"Ya can't win if ya don't score!"

So, which players have performed the best in terms of hitting leadoff homers throughout the history of major league baseball? In this article the chronology of the best leadoff home run hitters is provided.

To ascertain the best leadoff home run hitters, a two-part evaluation process is used. In Part 1, the focus is on *single-season* leadoff home run performance. Part 2 focuses on *career* leadoff home run accomplishments.

Before providing the findings of my research, it is important to know how the data for leadoff home runs were obtained.

The primary source for information was *The Home Run Encyclopedia,* which covers all of the major league homers hit up through the 1995 season. For the 1996-2004 seasons, the SABR Home Run Log was utilized, thanks to the cooperation of David Vincent. Two independent steps were utilized for collecting (and verifying) the leadoff home run information.

First, I checked each player included in the hitter register of *The Home Run Encyclopedia* and recorded the number of leadoff home runs he hit in each season (from 1876 through 1995).

Next, I went through the "Yearly Home Run Totals by Team and League—Home Run Totals (by Hitter)" section and recorded the number of leadoff home runs credited to each team for each season from 1876 through 1995. Then, utilizing the complete player rosters available in *The Great Encyclopedia of 19th Century Major League Baseball* and the *Sports Encyclopedia: Baseball,* I recorded the names of the leadoff home run hitters for each team for each season from 1876 through 1995.

These two (seemingly redundant) steps were carried out so as to have an independent verification of each search—to make certain that I didn't make any transcription errors and to make sure that the player-team information in *The Home Run*

Encyclopedia was internally consistent. In other words, if the encyclopedia stated that the Red Sox had four leadoff homers in 1967, there has to be some number of Boston players with the same total of leadoff homers in 1967. And vice versa. As it turned out, there was only a handful of leadoff home run inconsistencies in *The Home Run Encyclopedia* (perhaps due to incorrect inputting at the publisher's end). Fortunately, these inconsistencies were readily cleared up by resorting to the SABR Home Run Log.

Part 1. SINGLE-SEASON LEADOFF HOME RUN PERFORMANCE

Table 1 lists the players who hit the most leadoff home runs during each season of the 1876-2004 period. For those players who were repeat leaders, a number in parentheses after the player's name gives the number of times he was the single-season leader in leadoff homers.

Table 1. Single-Season Leaders in Leadoff Homers

Year	Player	Team	Lg	LOHR
1876	Jack Remsen	HAR	NL	1
	Joe Gerhardt	LOU	NL	1
	George Wright	BOS	NL	1
1877	Lip Pike	CIN	NL	1
1878	None hit			
1879	Charley Jones	BOS	NL	2
1880	Harry Stovey	WOR	NL	2
1881	Fred Dunlap	CLE	NL	1
	George Wood (1)	DET	NL	1
	Buttercup Dickerson	WOR	NL	1
1882	George Wood (2)	DET	NL	1
1883	Buck Ewing	NY	Nl	4
1884	Abner Dalrymple (1)	CHI	NL	4
1885	Abner Dalrymple (2)	CHI	NL	3
1886	Hardy Richardson (1)	DET	NL	2
1887	Hardy Richardson (2)	DET	NL	3
1888	Jimmy Ryan (1)	CHI	NL	4
1889	Jimmy Ryan (2)	CHI	NL	6
1890	Mike Tiernan (1)	NY	NL	3
1891	Jimmy Ryan (3)	CHI	NL	2
	Tom Brown (1)	BOS	AA	2
1892	Jack Crooks	STL	NL	4
1893	Jimmy Ryan (4)	CHI	NL	2
	Billy Hamilton (1)	PHI	NL	2
	Herman Long	BOS	NL	2
1894	Tom Brown (2)	LOU	NL	1
	Billy Hamilton (2)	PHI	NL	1
	Bobby Lowe	BOS	NL	1
	Tom Daly	BRK	NL	1
	Cupid Childs	CLE	NL	1
	Bill Joyce	WAS	NL	1
1895	Jesse Burkett (1)	CLE	Nl	?

Year	Player	Team	Lg	LOHR	Year	Player	Team	Lg	LOHR
1896	Bill Everitt	CHI	NL	2	1922	Dave Bancroft	NY	NL	1
	Fred Clarke (1)	LOU	NL	2	1923	Whitey Witt	NY	AL	3
	Jake Beckley	NY	NL	2	1924	Bernie Neis	BRK	NL	2
1897	Kip Selbach	WAS	NL	3		Ray Blades (1)	STL	NL	2
1898	Jimmy Ryan (5)	CHI	NL	1		Ross Youngs	NY	NL	2
	Fred Clarke(2)	LOU	NL	1		Heinie Sand (1)	PHI	NL	2
	Mike Tiernan (2)	NY	NL	1	1925	Gene Robertson	STL	AL	2
	Mike Griffin	BRK	NL	1		Ray Blades (2)	STL	NL	2
	Mike Smith	CIN	NL	1	1926	Dick Cox	BRK	NL	1
	George VanHaltren	NY	NL	1		Mark Koenig	NY	AL	1
1899	Jimmy Ryan (6)	CHI	NL	2		Ray Blades (3)	STL	NL	1
1900	Sam Mertes	CHI	NL	2		Heinie Sand (2)	PHI	NL	1
1901	Jesse Burkett (2)	STL	NL	3		Johnny Mostil	CHI	AL	1
1902	Jimmy Ryan (7)	WAS	AL	2	1927	Earle Combs (1)	NY	AL	3
1903	Joe Kelley	CIN	NL	1	1928	Jimmy Welsh	NY	NL	2
	Harry Bay	CLE	AL	1	1929	Roy Johnson	DET	AL	4
	Topsy Hartsel (1)	PHI	AL	1	1930	Johnny Frederick (1)	BRK	NL	4
	Jesse Burkett (3)	STL	AL	1	1931	Fred Schulte	STL	AL	2
	Patsy Dougherty	BOS	AL	1		Johnny Frederick (2)	BRK	NL	2
	George Brown	NY	NL	1	1932	Earle Combs (2)	NY	AL	4
1904	Tommy Leach (1)	PIT	NL	2	1933	Dixie Walker	NY	AL	2
1905	Joe Cassidy	WAS	AL	1		Max Bishop	PHI	AL	2
	Mike Donlin	NY	NL	1	1934	Len Koenecke	BRK	NL	2
	Jesse Burkett (4)	BOS	AL	1		Billy Urbanski (1)	BOS	NL	2
1906	Harry Lumley	BRK	NL	2		Harlond Clift	STL	AL	2
1907	Elmer Flick	CLE	AL	2	1935	Oscar Melillo	BOS	AL	1
	Topsy Hartsel (2)	PHI	AL	2		Jo-Jo White	DET	AL	1
1908	George Stone (1)	STL	AL	2		Pete Fox	DET	AL	1
1909	George Stone (2)	STL	AL	1		Lyn Lary (1)	STL	AL	1
	Beals Becker	BOS	NL	1		Billy Urbanski (2)	BOS	NL	1
	Eddie Hahn	CHI	AL	1		Ethan Allen	PHI	NL	1
	Larry Doyle	NY	NL	1		Pepper Martin	STL	NL	1
	Fred Tenney	NY	NL	1		Jo-Jo Moore	NY	NL	1
	Bob Bescher (1)	CIN	NL	1	1936	Dusty Cooke	BOS	AL	2
1910	Bob Bescher (2)	CIN	NL	2		Augie Galan	CHI	NL	2
1911	Josh Devore	NY	NL	2		Kiki Cuyler	CIN	NL	2
1912	Bob Bescher (3)	CIN	NL	2		Frankie Crosetti (1)	NY	AL	2
1913	Harry Hooper (1)	BOS	AL	3	1937	Wally Moses (1)	PHI	AL	4
1914	Tommy Leach (2)	CHI	NL	3		Lyn Lary (2)	CLE	AL	4
1915	Fritz Maisel	NY	AL	2	1938	Terry Moore	STL	NL	2
1916	Rabbit Maranville	BOS	NL	3		Boze Berger	CHI	AL	2
1917	Joe Kelly	BOS	NL	1		Wally Moses (2)	PHI	AL	2
	Jack Smith	STL	NL	1		Lee Handley	PIT	NL	2
	Burt Shotton	STL	AL	1	1939	Frankie Crosetti (2)	NY	AL	5
	Harry Hooper (2)	BOS	AL	1	1940	Joe Gordon	NY	AL	2
	Dode Paskert	PHI	NL	1	1941	Billy Knickerbocker	CHI	AL	2
	George Burns (1)	NY	NL	1	1942	Stan Hack	CHI	NL	3
1918	None hit				1943	Lou Klein	STL	NL	3
1919	Charlie Pick	BOS	NL	1	1944	George Stirnweiss (1)	NY	AL	2
	Fred Nicholson	PIT	NL	1	1945	Eddie Lake (1)	BOS	AL	3
	Sammy Vick	NY	AL	1		George Stirnweiss (2)	NY	AL	3
	Max Flack (1)	CHI	NL	1	1946	Sherry Robertson	STL	AL	3
	Morrie Rath	CIN	NL	1	1947	Eddie Lake (2)	DET	AL	3
	George Burns (2)	NY	NL	1	1948	Eddie Joost (1)	PHI	AL	6
1920	Roger Peckinpaugh	NY	AL	2	1949	PeeWee Reese	BRK	NL	4
	Harry Hooper (3)	BOS	AL	2	1950	Eddie Yost (1)	WAS	AL	3
	Ray Powell	BOS	NL	2		Eddie Stanky	NY	NL	3
1921	Les Mann (1)	STL	NL	4	1951	Carl Furillo	BRK	NL	5
1922	Frank Welch	PHI	AL	1	1952	Davey Williams	NY	NL	4
	Jimmy Dykes	PHI	AL	1		Eddie Joost (2)	PHI	AL	4
	Les Mann (2)	STL	NL	1	1953	Cal Abrams	PIT	NL	5
	Mike Menosky	BOS	AL	1	1954	Gil McDougald	NY	AL	3
	Russ Wrightstone	PHI	NL	1	1955	Hank Bauer (1)	NY	AL	5
	Harry Hooper (4)	CHI	AL	1	1956	Al Smith	CLE	AL	3
	Max Flack (2)	STL	NL	1		Hank Bauer (2)	NY	AL	3
	Andy High	BRK	NL	1		Eddie Yost (2)	WAS	AL	3
	Jigger Statz	CHI	NL	1	1957	Hank Bauer (3)	NY	AL	3
	Jack Tobin	STL	AL	1	1958	Hank Bauer (4)	NY	AL	4
	Lu Blue	DET	AL	1	1959	Eddie Yost (3)	DET	AL	5
	George Burns (3)	CIN	NL	1	1960	Eddie Yost (4)	DET	AL	3

Year	Player	Team	Lg	LOHR
1961	Bobby Malkmus	PHI	NL	2
	Joey Amalfitano	SF	NL	2
	Al Heist	CHI	NL	2
	Albie Pearson	LA	AL	2
	Bill Virdon	PIT	NL	2
	Chuck Schilling	BOS	AL	2
1962	Lou Brock (1)	CHI	NL	3
	Jake Wood (1)	DET	AL	3
1963	Jake Wood (2)	DET	AL	4
1964	Rico Carty	MIL	NL	3
	Tony Kubek	NY	AL	3
	Zoilo Versalles	MIN	AL	3
1965	Felipe Alou (1)	MIL	NL	5
1966	Dick McAuliffe	DET	AL	5
	Felipe Alou (2)	ATL	NL	5
1967	Felipe Alou (3)	ATL	NL	5
	Lou Brock (2)	STL	NL	5
1968	Don Buford (1)	BAL	AL	3
1969	Bobby Bonds (1)	SF	NL	5
1970	Bert Campaneris	OAK	AL	6
	Tommy Harper (1)	MIL	AL	6
1971	Don Buford (2)	BAL	AL	5
1972	Tommy Harper (2)	BOS	AL	4
1973	Bobby Bonds (2)	SF	NL	11
1974	Don Money (1)	MIL	AL	4
	Ralph Garr	ATL	NL	4
1975	Bernie Carbo	BOS	AL	4
	Don Money (2)	MIL	AL	4
	Bobby Bonds (3)	NY	AL	4
	Ken Singleton	BAL	AL	4
1976	Rick Monday	CHI	NL	8
1977	Mike Hargrove	TEX	AL	5
1978	Bill Madlock	SF	NL	4
	Davey Lopes (1)	LA	NL	4
1979	Davey Lopes (2)	LA	NL	7
1980	Davey Lopes (3)	LA	NL	6
1981	Rickey Henderson (1)	OAK	AL	3
1982	Brian Downing	CAL	AL	6
1983	Lou Whitaker	DET	AL	4
1984	Claudell Washington	ATL	NL	5
1985	Rickey Henderson (2)	NY	AL	7
1986	Rickey Henderson (3)	NY	AL	9
1987	Kal Daniels	CIN	NL	8
1988	Barry Bonds	PIT	NL	8
1989	Rickey Henderson (4)	NY-OAK	AL	5
1990	Rickey Henderson (5)	OAK	AL	5
1991	Paul Molitor	MIL	AL	6
	Devon White (1)	TOR	AL	6
1992	Rickey Henderson (6)	OAK	AL	5
	Devon White (2)	TOR	AL	5
1993	Rickey Henderson (7)	OAK-TOR	AL	8
1994	Ray Lankford	STL	NL	5
	Tony Phillips (1)	DET	AL	5
1995	Tony Phillips (2)	CAL	AL	6
1996	Brady Anderson (1)	BAL	AL	12
1997	Nomar Garciaparra	BOS	AL	7
1998	Johnny Damon	KC	AL	5
	Chuck Knoblauch (1)	NY	AL	5
	Ray Durham (1)	CHI	AL	5
1999	Chuck Knoblauch (2)	NY	AL	8
2000	Brady Anderson (2)	BAL	AL	7
2001	Craig Biggio	HOU	NL	8
2002	Jacque Jones	MIN	AL	11
2003	Alfonso Soriano	NY	AL	13
2004	Brad Wilkerson	MON	NL	9
	Ray Durham (2)	SF	NL	9

Table 1 shows that two players tied for the most single-season leadoff home run titles—Jimmy Ryan and Rickey Henderson—each with seven:

- Ryan was the major league leadoff home run king in 1888 (4), 1889 (6), 1891 (2), 1893 (2), 1898 (1), 1899 (2), and 1902 (2).

- Henderson won the ML LOHR crown in 1981(3), 1985 (7), 1986 (9), 1989 (5), 1990 (5), 1992 (5), and 1993 (8).

Thus, Jimmy Ryan and Rickey Henderson (whose careers were essentially 100 years apart) may be considered "the very best among the best" single-season leadoff home run hitters.

Next behind Ryan and Henderson were four players who each captured four single-season leadoff home run blue ribbons. Jesse Burkett spread his four out over two centuries— 1895 (2), 1901 (3), 1903 (1), and 1905 (1). Harry Hooper copped his four over a 10-year period—1913 (3), 1917 (1), 1920 (2), and 1922 (1). Hank Bauer earned his four in consecutive seasons—1955 (5), 1956 (3), 1957 (3), and 1958 (4). And Eddie Yost won his four LOHR titles over an 11-year span—1950 (3), 1956 (3), 1959 (5), and 1960 (3).

There were six players who were each three-time winners of a single-season leadoff home run gold medal—Bob Bescher (1909, 1910, and 1912); George Burns (1917, 1919, and 1922); Ray Blades (1924, 1925, and 1926); Felipe Alou (1965, 1966, and 1967); Bobby Bonds (1969, 1973, and 1975); and Davey Lopes (1978, 1979, and 1980).

There were 32 players who picked up a pair of leadoff home-run crowns, including Hall of Famers Billy Hamilton, Earle Combs, and Lou Brock.

The chronology of the players who first achieved each single-season milestone leadoff homer is summarized in Table 2.

Jack Remsen of the 1876 Hartford club smacked the first leadoff home run in major league history, on July 6 of that season. Interestingly, it was also his first major league homer and the only leadoff home run in his big league career.

Charley Jones of the 1878 Boston club was the first player to collect two leadoff homers in a single season. A few years later, the single-season mark was increased to three by George Wood of the 1882 Detroits and then to four by Buck Ewing of the 1883 New Yorks.

Jimmy Ryan of the Chicago club raised the bar for single-season leadoff homers to 6 in 1889. And it remained there for over 80 years (although three players managed to equal the mark—Eddie Joost (in 1948), Bert Campaneris (in 1970), and Tommy Harper (in 1970).

Table 2. Chronology of Players Who First Achieved Each Single-Season Milestone Leadoff Home Run

LOHR Milestone	Player	Team	Lg	Year	Players who subsequently equaled the milestone before the next was reached
1	Jack Remsen	HAR	NL	1876	J. Gerhardt (1876); G. Wright (1876); L. Pike (1877)
2	Charley Jones	BOS	NL	1878	H. Stovey (1880)
3	George Wood	DET	NL	1882	
4	Buck Ewing	NY	NL	1883	A. Dalrymple (1884); J. Ryan (1888)
5,6	Jimmy Ryan	CHI	NL	1889	E. Joost (1948); B. Campaneris (1970); T. Harper (1970)
7-11	Bobby Bonds	SF	NL	1973	
12	Brady Anderson	BAL	AL	1996	
13	Alfonso Soriano	NY	AL	2003	

In 1973, Bobby Bonds of the San Francisco Giants nearly doubled Ryan's single-season leadoff home run record when he clouted 11. That mark lasted for over 20 years until Brady Anderson of the 1996 Baltimore Orioles became the first player to collect a dozen leadoff homers in a single season.

And in 2003, Alfonso Soriano of the New York Yankees upped the record to 13. Now, let's take a look at career leadoff home run performance.

Part 2. CAREER LEADOFF HOME RUN PERFORMANCE

Table 3 presents the players who amassed 10 or more leadoff homers during the 1876-2004 period—72 players achieved the 10 LOHR plateau. Also provided for each of these players are the years of his first and last leadoff homers, the most leadoff homers he hit in a single season (S-S), and the (first) year that he achieved his single-season best for leadoff homers.

Rickey Henderson heads the list of players with the most career leadoff homers—"Mr. Make It Happen" amassed a phenomenal total of 81 game-starting homers in his career (1979-2003). Henderson hit 73 of his leadoff homers while playing in the junior circuit—the most in AL history. In second place is Brady Anderson (1992-2001) with career 44 career game-opening homers. And in third position is Craig Biggio (1988-2004), with 41 lifetime leadoff homers—all in the senior loop, and the most in NL history.

Rounding out the top-ten/eleven are Bobby Bonds (35), Ray Durham (34), Devon White (34), Paul Molitor (33), Chuck Knoblauch (31), Tony Phillips (29), Kenny Lofton (28), and Davey Lopes (28). Biggio, Durham, and Lofton are still active.

It is significant to point out that 19th-century leadoff home run star Jimmy Ryan currently occupies the 17th position in the all-time list—more than 100 years after his final leadoff home run. He had held the major league lifetime leadoff homers record for nearly 70 years—from 1891 through 1958. Three other 19th-century players are also included in Table 3—Tom Brown (13), Hardy Richardson (11) and George Wood (11).

Table 4 lists those players who were first to achieve each

Table 3. Most Career LOHR During the 1876-2003 Period

Player	First LOHR	Last LOHR	Most LOHR S-S	Year Most LOHR	Career LOHR	Player	First LOHR	Last LOHR	Most LOHR S-S	Year Most LOHR	Career LOHR
Rickey Henderson	1979	2003	9	1986	81	Derek Jeter	1996	2004	4	2001	13
Brady Anderson	1992	2001	12	1996	44	Terry Puhl	1978	1982	5	1980	13
Craig Biggio	1992	2004	8	2001	41	Joe Morgan	1965	1983	4	1965	13
Bobby Bonds	1968	1980	11	1973	35	Al Bumbry	1973	1984	3	1979	13
Ray Durham	1997	2004	9	2001	34	Bert Campaneris	1964	1972	6	1970	13
Devon White	1988	2001	6	1991	34	Tom Brown	1883	1896	3	1883	13
Paul Molitor	1978	1991	6	1991	33	Brad Wilkerson	2002	2004	9	2004	12
Chuck Knoblauch	1992	2002	8	1999	31	Ichiro Suzuki	2001	2004	5	2002	12
Tony Phillips	1986	1999	6	1995	29	Al Smith	1954	1960	4	1955	12
Davey Lopes	1974	1981	7	1979	28	Oddibe McDowell	1985	1990	4	1986	12
Kenny Lofton	1992	2003	5	1999	28	Billy Bruton	1954	1964	2	1954	12
Eddie Yost	1950	1960	5	1959	27	Steve Sax	1982	1993	3	1988	12
Brian Downing	1981	1992	7	1987	25	Rafael Furcal	2001	2004	4	2002	11
Lou Brock	1962	1979	5	1967	24	Ron Gant	1988	1996	3	1989	11
Lou Whitaker	1982	1988	4	1982	23	Claudell Washington	1983	1989	5	1984	11
Tommy Harper	1965	1976	6	1970	23	Tommie Agee	1967	1973	4	1969	11
Jimmy Ryan	1888	1902	6	1889	22	Darin Erstad	1998	2000	4	1999	11
Alfonso Soriano	2002	2003	13	2003	21	Ralph Garr	1973	1977	4	1974	11
Barry Bonds	1986	1990	8	1988	20	Mickey Rivers	1974	1980	3	1977	11
Felipe Alou	1958	1968	5	1965	20	Willie Wilson	1979	1988	4	1986	11
Jacque Jones	1999	2003	11	2002	20	Hardy Richardson	1884	1889	3	1887	11
Shannon Stewart	1998	2004	5	2000	20	George Wood	1881	1889	3	1882	11
Dick McAuliffe	1961	1971	5	1966	19	Kal Daniels	1986	1989	8	1987	10
Eddie Joost	1948	1953	6	1948	19	Al Martin	1995	1999	6	1999	10
Lenny Dykstra	1986	1994	4	1993	19	Don Money	1974	1976	4	1974	10
Eric Young	1993	2003	3	1996	19	Johnny Frederick	1929	1932	4	1930	10
Rick Monday	1973	1976	8	1976	17	Bill Doran	1983	1991	3	1986	10
Hank Bauer	1952	1958	5	1955	17	Marvin Benard	1996	2001	4	1999	10
Marquis Grissom	1992	2001	7	1996	17	Doug Glanville	1997	2003	3	2001	10
Danny Gladden	1984	1991	5	1988	17	Wally Moses	1935	1947	4	1937	10
Pete Rose	1963	1977	3	1969	17	Luis Polonia	1987	2000	4	1999	10
Tim Raines	1981	1999	5	1993	16	Earle Combs	1927	1932	4	1932	10
Don Buford	1965	1971	5	1971	15	Tony Taylor	1958	1973	3	1970	10
Johnny Damon	1995	2004	5	1998	15	Harry Hooper	1910	1923	3	1913	10
Juan Samuel	1984	1989	4	1989	14						
Gary Redus	1982	1992	3	1987	14						
Frankie Crosetti	1934	1942	5	1939	14						

career milestone leadoff homer. It is noted that these milestones include leadoff home runs hit in both the National and/or American Leagues (as well as the American Association, the Union Association, the Players League, and the Federal League). A total of seven players are listed—Jack Remsen, Charley Jones, George Wood, Jimmy Ryan, Eddie Yost, Bobby Bonds, and Rickey Henderson.

The first player to reach double digits in leadoff homers was George Wood, who collected his 10th LOHR in 1889. Jimmy Ryan was the first player to hit 20 career leadoff homers—he reached that plateau in 1900. Three-quarters of a century later, in 1975, Bobby Bonds became the first player to hit 30 career leadoff homers. Since 1989, it's been all Rickey Henderson. Mr. "Make It Happen" has been the first player to reach each of the next several decile milestones in leadoff homers—40 (in 1989); 50 (in 1991); 60 (in 1993); 70 (in 1996); and 80 (in 2002).

Table 4. The First Major Leaguer to Achieve Each Career Milestone Leadoff Homer

LOHR Milestone	Player	Year(s)
1	Jack Remsen	1876
2	Charley Jones	1879
3-11	George Wood	1882; 1889
12-22	Jimmy Ryan	1891; 1902
23-27	Eddie Yost	1959; 1960
28-35	Bobby Bonds	1973; 1980
36-81	Rickey Henderson	1989; 2003

I Don't Care If I Ever Get Back:
Marathons Lasting 20 or More Innings

"It is the mark of an instructed mind to rest satisfied with the degree of precision which the nature of the subject admits, and not to seek exactness when only an approximation of the truth is possible."
— Aristotle

Baseball is thankfully free of artificial boundaries of time which confine other sports. This freedom helps to shape the unique magical charm that is an evening at the ballpark. Fans never know whether it will be a two-hour squeaker or whether they may be enchanted until past sunrise by the first-ever wild 12-hour 46-inning slugfest.

In the bottom of the seventh, baseball fans worldwide stand up to sing Albert von Tilzer's music and Jack Norworth's lyrics for the 1908 baseball anthem, "Take Me Out to the Ball Game." When games go into extra innings, the song is sung again, with much more meaning, in the bottom of the 14th, bottom of the 21st, bottom of the 28th, etc. Each time it ends with "I don't care if I *ever* get back."

For 41 years I have been researching baseball games lasting 20 or more innings, finishing after 1:00 a.m. local time, and taking more than six hours, ever since my father and I attended a 26-inning twinight doubleheader at Forbes Field August 9, 1963. After a long rain delay, the opener went 15 innings, and Roberto Clemente's RBI ended the nightcap in the 11th at 2:30 a.m. The next day, we discovered nobody at KDKA Radio or any Pittsburgh newspaper could answer the question, "Is that the longest-ever night of baseball?"

For purposes of this article, a marathon is defined as a game lasting 20 or more innings. In my research I have discovered 352 marathons. These games are hard to find. Leagues either keep no records, or keep track only of their longest game; only the Texas League keeps records of all marathons. Appendix 1 contains a complete listing of all marathons. A more complete

In 1986, **PHIL LOWRY** argued passionately for asymmetrical ballparks in his book *Green Cathedrals*, stating that symmetrical toilet bowl, cookie-cutter, ashtray stadia were destroying the soul of the game. If you know of any marathons missing from Phil's list, let him know at plowry1176@aol.com.

version of this article can be found on the SABR web site at www.sabr.org, where you can find an appendix listing the evolution for the record for longest game by innings.

Nobody has ever before explored such questions as: What is the probability a game will go x number of innings? How often should we expect a marathon of 20 or more innings, or 40 or more innings? What is the probability the 26-inning major league record will be broken in the next y number of years? Which is "rarer," the 26-inning major league record, 33-inning minor league record, or 45-inning "other" category record? In this article we'll answer all of these questions.

If you ask baseball historians who hit the most triples in a season, they reply Chief Wilson of the Pirates, with 36 triples in 1912. They assume you are asking about the major leagues. But if you ask the question for all levels of play, in all countries, nobody has ever even asked the question, much less answered it. We must ask and answer such questions. My research is hopefully one small contribution towards giving equal treatment to all levels of competition and to all nations.

JOE DiMAGGIO'S HITTING STREAK

There are important parallels between this research on the probability that marathons will occur, and research concerning the probability a batter may ever break Joe DiMaggio's 56-game hitting streak, the prime example of a baseball event totally defying the laws of probability. The late Stephen Jay Gould once stated that DiMaggio's streak was the "most extraordinary thing that has ever happened in sports." I hope these parallels can be further explored in the future.

LONGEST MARATHONS NEVER PLAYED

The record for longest game has been increasing ever since the first baseball game was played back in the late 1700s or early 1800s. But the record has been cluttered with games that were never played! At the Delaware County Fairgrounds in Manchester, Iowa, in September 1925, or so the story goes, the Cascade Reds and Ryan Shamrocks started a game they never dreamed would last two years! The supposed "54-inning" game continued over six days through 16 innings, another 15 innings, a rainout, a snowout, another 14 innings, and finally another nine innings. Cascade finally won 9-8 in September 1926. This

was thought to be an incredible all-time baseball record which would never be broken.

However, as I tracked down microfilm records, I discovered that, as is so often the case, not all is as it seems! Thanks to SABR member R. J. Lesch, the mystery was unraveled as we obtained accounts from the *Cascade Pioneer, Dubuque Telegraph-Herald,* and *Cedar Rapids Gazette.* Box scores proved the supposed 54-inning game was actually four separate games! So how were generations of baseball historians misled? Local newspapers clearly indicated four separate games were played. But when Maury White's column in the May 21, 1984 *Des Moines Register* mistakenly referred to a "54-inning game," the seed was planted for the "great myth."

I uncovered another supposed six-day-long contest which never happened. From 1976 through 2004, a 28-inning game between Highland and Griffith High Schools in Indiana was listed by the National Federation of High School Associations as the longest high school game ever played. But there was never any final score given, and it was always listed simply as "1976," with no month and no date.

David Zandstra of the Highland Historical Society finally solved the puzzle by finding a scrapbook containing articles from the *Lake Suburban Sun Journal* and *Gary Post-Tribune.* The first three days were rainouts, 10-inning and 11-inning tie games were played on the fourth and fifth days, and Griffith took a 5-2 victory in seven innings on the sixth day.

I found four other "marathons" which were never played: a 33-inning 1906 3-I League game supposedly begun in Iowa and finished in Illinois, a 28-inning 1948 amateur game in South Dakota, a 22-inning 1932 Mississippi Valley League game in Iowa, and a 20-inning 1904 Cotton States League game in Mississippi.

LONGEST MASSACHUSETTS-RULES MARATHON

During the 19th century many games were played under Massachusetts Rules, requiring the winning team to score a minimum number of runs or "tallies," sometimes 25, sometimes 50, sometimes 100. Such games established records for innings played which have never been equaled. But these records must be considered differently than other records, since one inning was not three outs, but rather one.

On July 28-29, 1859, the longest ever game by innings was played in Ashland, Massachusetts. The Medway Unions downed the Upton Excelsiors 100-78 in 211 innings and 14:10 game time. The next year, in 1860, in Worcester, the same two clubs played 172 innings over seven days! Final score: Upton 50, Medway 29, after 21:50 game time.

LONGEST FICTIONAL MARATHON

The Iowa Baseball Confederacy by W. P. Kinsella is the greatest baseball novel ever written. The Chicago Cubs came to Big Inning, Iowa, July 4, 1908, to play an all-star team from the minor league Iowa Baseball Confederacy. After the game was adjourned for the evening, still tied, 5,000 fans packed the park the next day, having no idea the game would eventually continue through driving rainstorms for 40 days! At dawn on August 12, a Confederacy pinch-hit homer in the bottom of the 2,614th ended the game. Final score: Confederacy 12, Cubs 11.

LONGEST SPOOF MARATHON

In 1884, the *Denver Opinion* printed a spoof about a 39-inning 1873 game between two Portland, Oregon newspapers, the *Oregonian* and *Bulletin.* The game began at 12:30 p.m., and when darkness arrived, lanterns and locomotive headlights were found to light the field. At 1:00 a.m., in the 39th, a long fly to right was booted for a four-base error. Final score: Bulletin 1, Oregonian 0. Asked about his error, the right fielder stated moonlight had been shining in his face and he couldn't see the ball.

In 1907, the spoof innings record was broken in Munchausen, Pennsylvania, as the Lyerhelms and Fakenhursts played to a 50-inning scoreless tie. The "Liars" and "Fakers" played in a town named after Baron von Munchausen (1720-97), the famous German storyteller whose tall tales were so outrageous that the medical condition for compulsive lying, Munchausen's Syndrome, is named after him.

The next year, the record was broken again as the *Washington Post* told of a game at Jones County Eye, Ear, and Tongue Infirmary. At dusk, a farmer drove his horse-drawn wagon to a nearby university's chemistry lab to obtain phosphorus, which was smeared on the baseball to allow play to continue. At dawn, the Lightfoot Lilies took a 1-0 lead over the Ringtail Roarers in the top of the 57th on a mammoth homer by Bull Thompson. In the bottom of the inning, Bruiser Brown was at bat with a full count, two runners on, and only one out. Then, just as the pitcher picked the runner off second, Bruiser swung at a firefly flitting near the plate for strike three and a double play, ending the game.

The last spoof occurred in October 2003, authored by ESPN.com. The Cubs, waiting since 1908, and Red Sox, then waiting since 1918, met in the 2003 World Series to determine "whose curse is worse?" The Red Sox led 1-0 in Game Seven as the Cubs batted in the ninth at Fenway. With Fate desperately seeking to allow neither team to win, and the Cubs down to their last strike, Sammy Sosa hit a home run off the CITGO sign, tying the game. As dawn approached, a meteor struck the earth, floods covered the globe, and a dust

cloud encircled the planet. Chaos reigned, and Game Seven was suspended in the 28th inning. Final score: Cubs 34 Red Sox 34, with both teams still waiting to win a Series. Little then did the Red Sox know that they would wait only one more year!

FIRST-EVER GAMES OF X INNINGS
The first-ever game to last more than nine innings may have been the 10-inning game on November 18, 1845, at Elysian Fields in Hoboken. William Wheaton's Team beat William Tucker's Team 51-42. The 21-Rule called for the team scoring 21 runs first to be declared the winner, so these teams must have been tied at the end of several innings, or must have both exploded offensively in the 10th inning.

The first-ever games taking 1-45 innings, and last-ever games taking 20-45 innings are given in an appendix on the web site.

BALLPARKS AND CITIES IN MARATHONS: THE BEE HIVE
The park which hosted the most marathons is Braves Field in Boston, now known as BU's Nickerson Field—appropriate since it hosted the longest major league game ever played, 26 innings. Braves Field has seen five marathons, two between April 17, 1936, and April 23, 1941, when the Braves were officially named the Bees and the park was known as the Bee Hive.

LONGEST MAJOR LEAGUE MARATHON
At old Comiskey on May 8-9, 1984, the White Sox downed the Brewers 7-6 in 25 innings. Suspended after 17 innings at 1:05 a.m. by the AL curfew, the game was won the next evening in the 25th by Harold Baines' homer, which just barely cleared the bullpen fence in center. The Sox scored two in the ninth, and three in the 21st to keep the game tied, and would have won in the 23rd except Dave Stegman was ruled out for coach's interference when third base coach Jim Leyland helped him to his feet after Stegman tripped rounding third. This game is rich in "might-have-been's": Had it been an NL game with no curfew, it would have ended at 3:42 a.m. Had it been played between 1910-48 or 1976-80, when old Comiskey had no inner fence in center, Baines' drive would have been caught, and they might have broken the major league record of 26 innings. Had the game been the nightcap of the foggy September 24, 1971, Astros at Padres twinight doubleheader, which began at 12:01 a.m., it would have finished at 8:07 a.m., and the last few innings could have been covered live by *The Today Show*.

On September 11, 1974, Ken Reitz's homer for the Cards with two outs in the ninth tied up the Mets at Shea. Only a thousand fans remained to see Bake McBride score all the way from first in the 25th when Mets pitcher Hank Webb's pickoff throw to first was wild, and the relay to the plate was dropped by catcher Ron

Hodges to give the Cards a 4-3 win at 3:13 a.m. As home plate umpire Ed Sudol ruled McBride safe at the plate, he couldn't help but remember he had also been behind the plate during two other Mets marathon losses: 23 innings in 1964, and 24 innings in 1968. Amazingly, the first base umpire had called a balk on the pickoff. Under a rule recently changed, McBride would have had to return to second. He might never have scored, and the game might never have ended!

Because an April 22, 1871 game between Washington's Olympics and Nationals was later thrown out (along with the Nationals), the honor of setting the first major league innings record thus went "after-the-fact" to the Fort Wayne Kekiongas and Forest City's of Cleveland, who met May 4, 1871, in Fort Wayne, Indiana. Although this is considered the first major league game ever played, if one believes history cannot and should not be altered, then it is really the second.

There is no dispute whatsoever as to the longest major league game ever played. On May 1, 1920, the Boston Braves hosted the Brooklyn Robins at Braves Field. The game took 26 innings and lasted 3 hours 50 minutes, but ended as a 1-1 tie when called at 6:50 p.m. due to darkness by Umpire Barry McCormick. Two thousand fans saw starting pitchers Joe Oeschger of the Braves and Leon Cadore of the Robins go the whole way. This could never happen now, with the emphasis on relief pitchers, but starters commonly pitched entire marathons in the early 20th century.

The Robins' next two games were against the Phils and then vs. the Braves again. They took 13 and 19 innings respectively to lose both. So in just three games, they played 58 innings, losing two and tying one, a three-game record for futility which will probably never be equaled. You would think the Braves and Robins must hold the record for combined innings for two separate games when the first was tied and had to be replayed in its entirety: by adding nine innings played later to finally have the Braves win once and for all what began May 1, to the 26 innings played May 1, you have 35 innings. But you would be wrong! The A's and Tigers hold this record: 40 innings. On July 21, 1945, they played a 1-1 tie in 24 innings at Shibe Park. When they met two months later to finally come to a decision, the A's took 16 innings to win.

MOST INTERESTING EVENTS DURING MY RESEARCH
The research process involved in discovering marathons has taken me to the Hall of Fame Libraries in Cooperstown and Tokyo, and just about everywhere in between, including hundreds of ballparks, SABR meetings, and libraries. The most unusual discovery was the 21-inning 1939 marathon in Wisconsin in which the hometown Clintonville Four-Wheel-Drive (FWD) Truckers defeated Two Rivers Polar Bears 1-0. This game was

discovered in the June 29, 1939 *Daily Independent* of Helena, Montana!

I have been very fortunate to visit every major league park, roughly half the existing minor league fields, and many overseas diamonds in Latin America, Europe, Africa, Asia, and Australia. I especially treasure my "Croix de Candlestick," earned in the Giants' "Cave of the Winds;" watching the Yakult Swallows play through a monsoon in beautiful ancient Meiji Jingu Stadium in Tokyo without the slightest thought of a rain delay; taking the subway to Yankee Stadium after hearing on the radio at midnight that a rain-delayed game was only in the fifth; and cheering when the St. Paul Saints, trailing in the bottom of the ninth, down to their last out, scored *seven* consecutive runs, climaxed by a walk-off grand slam, to win the Northern League championship on September 19, 2004, the only season-ending walk-off grand slam ever hit in the history of baseball!

LONGEST MINOR LEAGUE MARATHON

At 4:07 a.m. on Easter morning, April 19, 1981, just 51 minutes before sunrise, 17 freezing and very fortunate souls huddled in the 28-degree pre-dawn chill of Pawtucket, Rhode Island's McCoy Stadium, having just watched their beloved Paw Sox fail to break a 2-2 tie with the Rochester Red Wings in the bottom of the 32nd. When the umpires suspended the game, these brave 17 fans could look back on 8 hours 7 minutes of baseball, preceded by a half-hour power failure delay.

The game resumed June 23, and the mercury had risen to 80 degrees. McCoy was packed to capacity, and because the major leagues were on strike, the eyes of the entire baseball world were focused on Pawtucket. The Paw Sox won 3-2 in the 33rd. Final totals of 8 hours 55 minutes elapsed time and 8 hours 25 minutes game time are modern baseball records, and 33 innings is still the all-time professional record. Momentoes of this historic game are now buried in a time capsule beneath the field, where they join the five-ton truck that in 1942 sank without a trace into the swampy outfield while McCoy was being built by the WPA.

LONGEST DOUBLEHEADER MARATHON

The longest doubleheader ever played was a North Carolina State League twinbill on July 5, 1915. The Raleigh Capitals downed the Durham Bulls 3-2 in 14 innings in the a.m. game at Raleigh. Then they bussed over to Durham for the p.m. game, which was called a 2-2 tie after 21 innings, making a total of 35 innings for the day. A list of all doubleheader marathons going 26 or more innings can be found on the web site.

LONGEST TRIPLE/QUADRUPLE/SEXTUPLEHEADERS

I have come across 14 occasions involving three or more games in one day. Amazingly, 12 were sweeps. The odds on that must be extremely low! Nine of 11 tripleheaders were sweeps.

Both minor league quadrupleheaders were sweeps. There has been just one minor league sextupleheader, again a sweep! In Manchester, NH, September 4, 1899, in the New England League, the host Manchesters swept six from the Portland Phenoms by 14-7, 12-8, 12-2, 8-4, 9-1, and a 9-0 forfeit. Portland walked off the field and forfeited after two innings in the sixth game to protest the ump's decision to eject one of their players, but the first five games lasted nine innings each, a total of 47 innings for the sextupleheader.

LONGEST MARATHONS WHICH BROKE NO RECORDS

Two 27-inning games, although tied for third longest minor league game ever, have received no attention because they were played after the Pawtucket 33-inning marathon in 1981 and therefore broke no records. The first was a three-day-long thriller at MacArthur Stadium in Syracuse. On June 19, 1985, the Pawtucket Paw Sox and Syracuse Chiefs played 22 innings before getting suspended. After a 13-minute rain delay in the 23rd, and another of 50 minutes in the 24th, the game was suspended again due to rain after 23½ innings. The Paw Sox finally won 3-1 on the third night. Total game time: 7:07. What makes this game even more amazing is it was the second time in just over a week the Chiefs had lost a three-day marathon! That Chiefs-Clippers game in Columbus was suspended after 20 innings, rained out the next night, and the Chiefs finally lost 8-7 in the 21st on the third night.

Three years later, on June 24, 1988, in Burlington, North Carolina, the Bluefield Orioles (Baby Birds) came to town for an Appalachian League game against the hometown Indians. When the Orioles finally won 3-2, the game had taken 8 hours 16 minutes, it was 3:27 a.m., and the crowd of 2,204 fans had dwindled to just either 84 or 50. Why the uncertainty on the remaining crowd at the end? Apparently, the sportswriters were sleepy because they had remarkably different accounts. Craig Holt of the *Burlington Times-News* counted 84 fans at the end, but wrote incorrectly that the finish had been at 3:37 a.m. rather than at 3:27 a.m. Dale Mullins of the *Bluefield Daily Telegraph* counted 50 fans at the end, and got the finish time correct as 3:27 a.m., but wrote incorrectly that the game had taken place in Raleigh rather than in Burlington.

I agree with Baby Birds manager Glenn Gulliver, who told reporters afterward, "I do not favor suspending games, no matter how long they take. That would wreck everything. You want to go until somebody wins." *Amen!* Suspension will always be a bad idea that wrecks everything. Let the ballplayers play on to a conclusion!

LONGEST MARATHON

On May 24, 1942, just 11 days before the Battle of Midway (June 4-7) began, Taiyo and Nagoya of the Japanese Federation fought to a 28-inning 4-4 tie, setting a new organized baseball record. Seventeen years later, on May 2, 1959, Nippon Pharmaceuticals defeated Kurashiki Rayon 2-1 in 29 innings. So Japan had some experience with marathons. But when play began on September 20, 1983, in the title game of the 38th annual Emperor's Cup Nan-shiki Tournament at Ibaraki-Mito Prefectural Stadium in Mito, Japan, nobody had the least idea what lay ahead!

The game between Light Manufacturing and Tanaka Hospital began at 8:50 a.m. The local Mito Band was to play after the game, and was asked to be ready at 11:00 a.m. As noon came and went, the teams were locked in a scoreless tie. After the 25th, plate umpire Choshu told the teams to take a 30-minute break. The players refused. Choshu joined his fellow umps for a short six-minute break, and then the game moved on. In the 35th, both teams pushed across one run, so the marathon continued. Finally, the game concluded at 5:15 p.m. after Light Manufacturing scored in the top of the 45th to win 2-1. Final totals: 1,029 pitches and 8 hours 19 minutes of baseball! Including the six-minute delay in the 26th, the game lasted 8:25. Excluding Massachusetts Rules games and games planned as marathons to raise funds, this is the longest game by innings in the history of baseball. The Mito Band finally got to play after waiting around for over six hours.

HOW MANY GAMES GO INTO EXTRA INNINGS?

Based on my detailed research, the best empirical data for percentage of extra-inning games is: 5.68% in the 1800s when late-afternoon starting times resulted in many games being called due to darkness before ever having the opportunity to go into extra innings, 9.16% in the 1900s through 1948 day-ball era when all or most games were played in daytime, and 9.41% during the night-ball era from 1949 through now. Our theoretical model estimates 10.3% of all games will go into extra innings.

VISITING TEAM ADVANTAGE IN MARATHON-LAND?

Of all the 352 marathons found so far, 46 have been in the major leagues, 173 in the minor leagues, and 133 in the "other" category (43 school games, 47 amateur games, 39 international games, and 4 women's games). One of the most surprising and unexplained facts about marathons is that a statistically significant majority (57%) have been won by the visiting team. Is there a hidden "visiting team advantage" lurking somewhere in the Kingdom of Marathons?

LONGEST MARATHON RAIN DELAYS

If one loves long marathon baseball games, what better to accompany them than a long rain delay! Old Comiskey holds the record for the longest major league rain delay ever: 7 hours 23 minutes on August 12, 1990. The game never even got started. Finally called off at 8:58 p.m., the game was played five days later in Texas. The Rangers won 1-0 in 13 innings, as Nolan Ryan had 15 strikeouts and gave up only three hits pitching the first 10 innings for Texas. The minor league rain delay record is held by Yogi Berra Stadium in Little Falls, NJ. The start of the August 14, 2000, Northern League game was delayed 7 hours 6 minutes, as the Catskill Cougars beat the NJ Jackals 6-1, ending at 11:06 p.m.

The longest rain delay ever recorded occurred May 24, 1978 in Holyoke, Massachusetts during the NCAA Northeast Regional. The umpires waited a full eight hours 12 minutes in the top of the seventh, from 1:50 p.m. until 10:02 p.m., before calling the game off, giving the Delaware Blue Hens a 1-0 victory over the Harvard Crimson.

The longest rain delay during one at-bat is 1:52 on July 22, 1994, at the Vet. In the bottom of the fourth, Mickey Morandini took one pitch from Scott Sanders at 9:12 p.m. before a 38-minute rain delay. He took a second pitch from Sanders at 9:50 p.m., before a second rain delay of 1:14 at 9:51 p.m. Then he completed his 1:53 at-bat by doubling to left off Jeff Tabaka at 11:05 p.m. The Padres finally won 7-4 at 1:56 a.m.

The longest rain delay during one inning is 5:00 on June 9, 1980, also at the Vet. Steve Carlton, pitching a no-hitter at the time, had to wait 5:15 between pitches. His last pitch of the top of the fourth was delivered at 8:19 p.m. His first pitch of the top of the fifth was delivered at 1:34 a.m., after two long rain delays in the bottom of the fourth, the first for 1:28 and the second for 3:32. The Giants finally won 3-1 at 3:11 a.m.

The longest rain delay during one game is 5:54 on July 2, 1993, again at the Vet. There were three rain delays: 1:10 at the start, 1:56 in the bottom of the fourth, and 2:48 in the top of the sixth. The Padres won 5-2 at 1:03 a.m., but the Phils came back to win the nightcap 6-5 in 10 innings at 4:40 a.m.

The longest rain delay during one game in the AL is 5:04 on September 19, 2000 at Camden Yards in the day portion of a day-night doubleheader. There were two rain delays: 2:43 at the start, and 2:21 in the top of the eighth. The A's finally won 7-4 at 10:36 p.m. The PA announcer told the crowd that the night game would begin promptly in 20 minutes. Six minutes later, however, he announced the night game had been postponed.

EMPIRICAL RESULTS FOR MAJOR LEAGUE MARATHONS

Since major league baseball began in 1871, there have been 46 major league marathons out of a total of 197,446 games played:

26 NL, 18 AL, one Negro NL, and one Negro AL. The empirical probability therefore that a major league game will take 20 or more innings is 46 / 197,446 = 1 / 4,294, or 0.02329%. This indicates a marathon should take place roughly every 4,294 games.

In 2004, there were 2,464 major league games. A major league marathon taking 20 or more innings can be expected to come along roughly every 4,294 / 2,464 = 1.74 seasons. So we should expect a marathon a little more often than once every other season. The Cards defeated the Marlins 7-6 in 20 innings in Miami, April 27, 2003, in the most recent one.

EXTRA-INNING AND MARATHON SCORING RECORDS

The highest-scoring major league extra-inning game is the 18-inning A's 18-17 win over the Indians in Cleveland on July 10, 1932. Jack Burnett got nine hits, and Eddie Rommel relieved in the second for the A's and went the rest of the way for the win, still the longest-ever relief effort in major league history.

Most runs scored by both teams in extra innings of a major league game is 13. On June 15, 1929, at Forbes Field, the Giants and Pirates were tied at 11 after nine, both scored one in the 11th, the Giants scored 8 in the 14th while the Pirates scored only 3: New York 20, Pittsburgh 15. On July 4, 1985, at Atlanta Stadium, the Mets and Braves were tied at 8 after 9, both scored two in the 13th, both scored one in the 18th, the Mets scored 5 in the 19th, while the Braves scored only 2: New York 16, Atlanta 13 at 3:55 a.m. The post-game Fourth of July fireworks were faithfully carried live back to New York viewers from 4:01 a.m. to 4:12 a.m. by the Mets WOR-TV broadcast team, which included Tim McCarver, who was no doubt recalling his lack of lightning speed at 3:15 a.m. in Philadelphia a decade ago September 25, 1975, which allowed Rusty Staub of the Mets to throw him out at the plate, thus ending another game that had been threatening to go until dawn!

The Rangers scored the most runs ever in one extra inning in a major league game on July 3, 1983, in Oakland, when they defeated the A's 16-4 with 12 runs in the 15th. One hundred years earlier, on September 6, 1883, Chicago scored 18 in the seventh inning, the most runs in an inning in a major league game.

The record for highest-scoring marathon was set August 1 and 8, 1932, when the K of P's A Team and K of P's B Team battled through two weekends and 22 innings in Elyria, Ohio, and we still don't know yet who won! On August 1, the two teams were tied 19-19 when the game was called on account of darkness. The game continued August 8 and was won by one of the teams in the 22nd, but we don't know the final score, or how many innings had been played when the game was suspended, or which team won.

We could also count games played under Massachusetts Rules. Then our highest-scoring marathon would be Upton's 100-56 victory over Medway in Worcester, October 11-12, 1859. And if we count planned marathons, the record is the African Gray Birds' 127-110 win over the Red-Eyed Nites in the Women's Marathon 24 Hours for Africa in Tucson, October 18-19, 2003.

DATABASES ON RUN PRODUCTION PER INNING

To predict how many games will go into extra innings, and how many extra innings they will last, one must first determine how many runs are scored in each inning. Dr. Darren Glass, professor of mathematics at Columbia University, and I used two different databases to create a theoretical model for extra innings. The first is my complete database for runs scored per inning for all games that have ever gone 20 or more innings and have a box score, with 5,298 innings in 206 games.

The second database consists of Dave Smith's Retrosheet data for innings 1-19 and my database for innings 20-45. Table 2 of Smith's 2004 SABR convention presentation entitled "Coming from Behind: Patterns of Scoring and Relation to Winning" took data for 73 seasons (1901, 1904, 1909-10, 1912-13, 1918, 1936, 1938-42, and 1944-2003), with 2,259,116 innings in 122,906 games. Combined, these two databases constitute the very best available data to predict how many runs teams will score in any given inning of any given game. The first database applies only to those games going 20 or more innings, while the second database applies to all games. These two databases are given in Appendix 2. Six very interesting facts arise out of these two databases.

First, run production is significantly higher in the first inning than in any other inning. Whereas teams score 0.487 runs per inning, the visiting team scores 0.514 and the home team scores 0.607 runs in the first inning. Higher scoring in the first inning is expected because this is the only inning in which teams are assured their best batters, at the top of the order, will all bat together.

Second, the often cited "home field advantage" is true for innings 1-8, with the home team scoring an average of 0.048 runs more per inning than the visiting team. As cited above, this home field advantage is by far most prominent in the first inning, when the home team scores on average 0.093 runs more than the visiting team.

Third, what appears to be a "visiting team advantage" exists from the ninth inning on, with the home team scoring an average of 0.051 runs less than the visiting team in innings 9-45. After some reflection, this is reasonable because after the home team scores enough runs to win the game from the bottom of the ninth inning on, the game is over and so the home team stops batting. This is not really a case of a "visiting team

advantage." A very interesting variation shows this difference is much less in the ninth inning (0.035 runs) than in innings 10-45 (0.124 runs). I have no explanation for this.

Fourth, run production is much lower in extra innings than in innings 1-9. This makes sense because extra-inning games are usually low-scoring. High-scoring games rarely go into extra innings, but there are many 1-0 and 2-1 extra-inning games. It is statistically much less likely for the Philadelphia A's 49-33 victory over the Troy Haymakers on June 28, 1871 (highest-scoring major league game ever) or the Cubs 26-23 win over the Phils on August 25, 1922 (highest-scoring NL game ever), to go into extra innings.

Fifth, my data limited to only games going 20 or more innings shows *dramatically* lower run production in innings 10-19 than does Smith's data based on all games. For example, Smith's data shows runs per inning of 0.392 in the 15th inning, vs. my data showing 0.029 in the 15th. Smith's data for innings 10-17 is more than ten times higher than my data for these same innings. Smith's data averages out to 0.387 runs per inning for innings 10-19. My data, on the other hand, averages out to only 0.026 runs per inning for innings 10-19. We can conclude marathons lasting 20 or more innings produce 93% fewer runs during innings 10-19 than do extra-inning games in general.

Sixth, other than higher scoring in the first inning, all scoring variations, both between visiting and home teams, and also between different innings, are so minor they may be ignored statistically. An average game involves each team scoring 0.487 runs per inning. Assuming the visiting and home teams each win roughly half the time, there will be an average of 8.75 innings (17.5 half-innings) per game in a game that does not go into extra innings, or a total of 0.487 x 17.5 = 8.52 runs per game. Variations such as the home team scoring 0.048 more runs per inning in innings 1-8, while interesting, are statistically insignificant. When evaluating the possibility of whether an average game, involving between 8 and 9 runs, will go into extra innings, this 0.048 runs per inning is only 0.048 / 8.52 = 0.0056, a statistically irrelevant half of one percent of the total runs in the game.

MATHEMATICAL MODEL OF EXTRA INNINGS

Based upon this data, Dr. Glass and I constructed our mathematical theory of extra innings. To establish our model, we made some definitions. Let n = the number of innings in an extra-inning game. Let $P(n)$ = the probability an extra-inning game will last n innings. Let T = the probability a game is tied after nine innings = the probability a game will go into extra innings.

Let k = the probability both teams will score the same number of runs in one inning. My database results in the value of k being 0.5841. We checked additional databases (see the Bibliography on the web site) from which it is possible to obtain an empirical value for k, including G. R. Lindsey's 0.5696 for all innings in 1958, Lindsey's 0.5895 for just extra innings in 1958, Lindsey's 0.5552 for all innings in 1959, Lindsey's 0.5479 for just extra innings in 1959, and Kevin Woolner's 0.5606 for 1980-98.

Now let's separate an extra-inning baseball game into three separate events. The first part is the beginning, or first nine innings. The second part is the middle, from the tenth inning through the next to the last inning, the $(n-1)$th inning. The third part is the last inning, the nth inning. Since these three events are statistically independent, $P(n)$ = the probability of a game going n innings will be the probability of the first part occurring times the probability of the second part occurring times the probability of the third part occurring.

The probability of the first part of a future extra-inning game occurring, as we have already discussed, is empirically $T = 0.0941$, and theoretically $T = 0.103$. There are several factors contributing to the discrepancy between our predicted theoretical value and the actual empirical data. The biggest one is that to build our model we assumed both teams are average, whereas in the real world one team may be above average and the other may be below average, which would decrease the probability of a game going into extra innings. For predictions regarding future games, we use $T = 0.103$.

The probability of the second part of the game occurring is k times itself for as many times as there are innings in the middle part of the game, from the tenth inning through the $(n-1)$th inning. The number of innings in this middle part of the game is $(n-1) - 9 = (n-10)$. We have to multiply k times itself $(n-10)$ times, so the probability of the second part of the game occurring is $k^{(n-10)}$.

The probability of the third part of the game occurring is trickier than the previous two probabilities. If k = the probability both teams score the same number of runs in an inning, then $(1-k)$ has to be the probability both teams do not score the same number of runs in an inning, because the combined probability that they do and they do *not* score the same number of runs in an inning must add up to one. Now all we need to do to get our theoretical model is to string together the three different probabilities of our three statistically independent events, and multiply them together:

$$P(n) = T k^{(n-10)} (1-k)$$

Getting the correct value of k is crucial to success of our model. The probability of two teams scoring the same number of
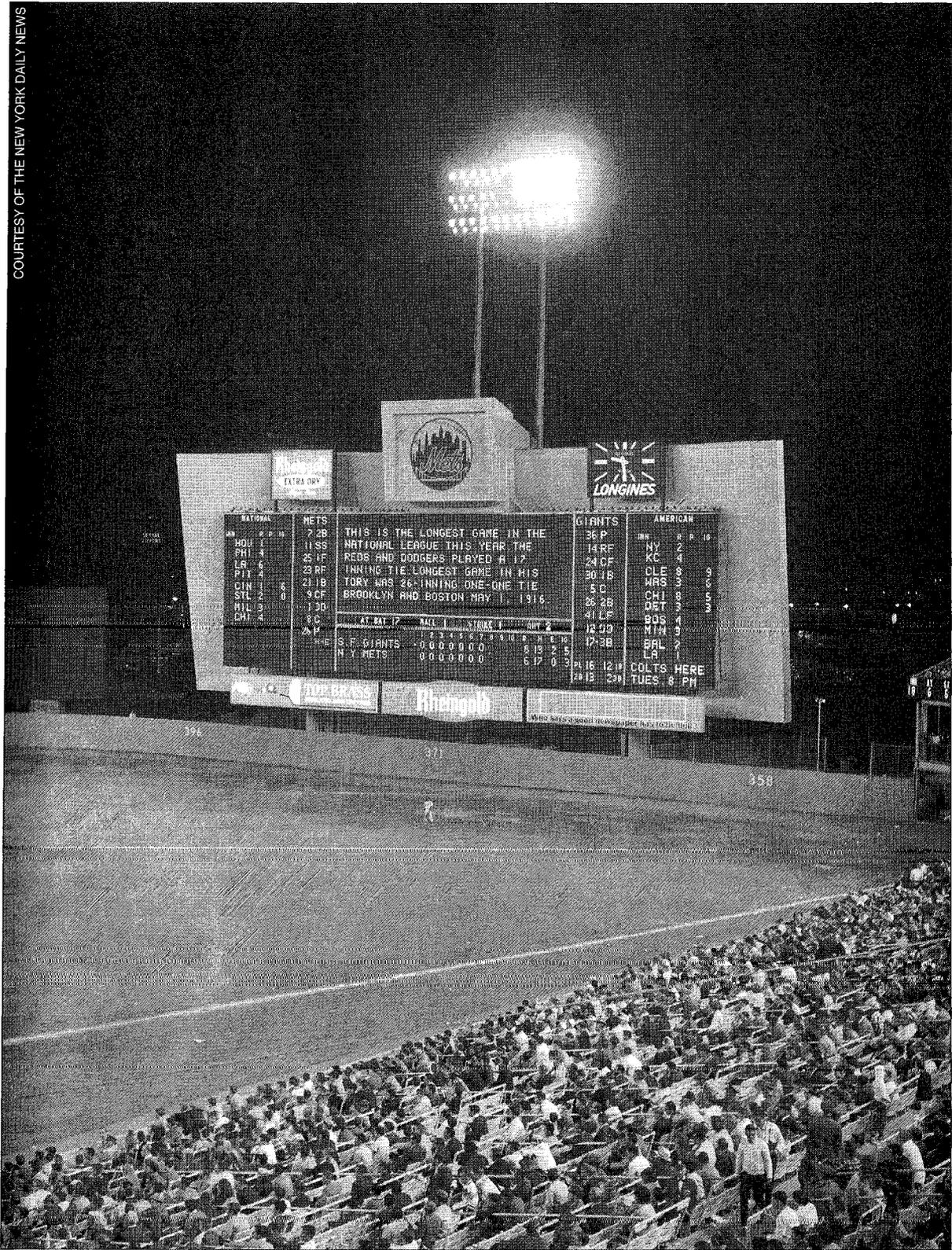
As the Giants and Mets moved to the 18th inning of the nightcap at Shea on May 31, 1964, the scoreboard in right field flashed this message, but got the date of the longest major league game ever played wrong (it was May 1, 1920). The scoreboard operator was tired; it was 9:30 p.m. and the opener had begun at 1:05 p.m. Little did he know that they had six innings to go, until 11:25 p.m., before the long 32-inning doubleheader would finally be over.

runs per inning goes down as offensive production increases. The number of extra-inning games and their lengths should increase during eras when scoring is low, such as the Deadball Era (this did in fact happen—see Appendix 1). We assume both teams score 0.487 runs per inning, based on Smith's data, the best available empirical data. This choice yields a value of k of 0.5559, or 55.59%.

Our theoretical model can be used to predict many things. First, it predicts the theoretical probability a game will take x number of innings to play. Second, it predicts the theoretical probability a game of x number of innings will take place in the next y number of years. To accomplish this, we must make some decisions. Do we count ties, fake ties, thrown-out games, forfeits, playoffs, World Series? I have done so. How many major league games have ever been played? I have calculated this number through 2004 as 197,446. This includes all games in the Negro Leagues, which I count as major leagues. How many minor league games have ever been played? Using the Sumner and Johnson/Wolff books as my guideline (see the Bibliography on the web site), I have calculated this number through 2004 as 1,405,188. How many games in the "other" category have been played, including school games, amateur games, international games, and women's games? I have estimated this number as ten times the number of minor league games, or 14,051,880.

Thus, my estimate of the total number of baseball games ever played through 2004, at all levels and at all locations worldwide, is 197,446 + 1,405,188 + 14,051,880 = 15,654,514. It should be noted many "other" category games are scheduled for only six or seven innings, and some minor league games are scheduled for only seven innings.

I believe all major league marathons taking 20 or more innings have been discovered. The only possible exception to this is that there could be one or more Negro League marathons yet to be discovered. For the purposes of this research, however, I assume all major league marathons have been found. This is definitely not the case for games in the minor leagues and the "other" category, due to incomplete records and lack of media coverage. Therefore, statistical probabilities for marathons developed in this article for all games at all levels are based on major league data.

Certain aspects of baseball strategy affecting the length of an extra-inning game are not included in our theoretical model. These aspects include such managerial strategies as going for a tie at home and a win on the road, frequency of using relief pitchers, cold vs. warm weather which can decrease or increase runs scored per inning, temperatures getting colder as a night game progresses, and eras such as the Deadball Era when offensive production has been significantly different.

Using the model, we calculated the chances of major league

games going x innings. The fit between theoretical and actual data seems very good. For example, our theoretical model predicts the probability of a major league game going exactly 10 innings should be 4.57%; actual data indicates it is 4.12%. Our model predicted reality to within 0.45%. Similarly, our model predicts the probability of a major league game going 16 innings to be 0.135%; actual data shows it is 0.133%. Our model predicts the probability of a major league game going 22 innings to be 0.00398%; actual data shows it is 0.00405%. The fit between our model and the real world is surprisingly good! Theoretical probabilities of a major league game going x innings are compared to empirical data in Appendix 3.

THE RELATIVE "RARITY" OF RECORD-LONG GAMES

So how "rare" are record-long marathons? Our theoretical model predicts the 26-inning major league record game is not as rare as empirical data would indicate, but the 33-inning minor league record game and 45-inning "other" category record game are significantly more rare than empirical data would indicate.

The record for a major league game is 26 innings in Boston. According to our theoretical model for the period 1871 (begin ning of the major leagues) through 2004, we should expect 57 major league marathons to have been played. In fact, there have been only 46. We should expect a 50% chance to experience a major league marathon in any given season. We should expect 0.939 major league games, or almost one, to have gone 27 or more innings by now. In fact, we have not yet had such a game in 134 years of major league play. We should expect a 10.9% chance to see a major league game of 27 innings or more in any given decade. Since we have been waiting almost thirteen and a half decades now, it is not at all unrealistic to expect we should soon have a major league game go 27 or more innings. The 26-inning Boston game may not be so rare. So far, so good. Our model is realistic, and fairly consistent with empirical data.

The record for a minor league game is 33 innings. If the percentage of minor league games which are marathons is the same as for the major leagues, or 0.02329%, then we should expect 327 minor league marathons. In fact, I have discovered 173 through 2004, 53% of the number to be expected. I had predicted I would find about 50% of minor league marathons.

We should expect 6.68 minor league games to have gone 27 or more innings. In fact, we have had six such games, further indication our model is doing a good job of predicting reality. We should expect 0.087 minor league games to have gone 33 innings. In fact, we have had one such game, which means our actual count is 11.5 times the expected count. So the 33-inning Pawtucket game may be very rare.

We should expect a 99.3% chance we will have a minor league marathon in any given season, a 0.13% chance we will have a minor league game of 34 or more innings in any given season, a 1.32% chance of seeing a minor league game of 34 innings or more in any given decade, and a 9.4% chance of seeing a minor league game of 34 innings or more in a lifetime of 75 years.

The record for an "other" category game is 45 innings. We should expect 0.000954 "other" category games to have gone 45 innings. In fact, we have had one game of 45 innings, which means our actual count of one is 1,048 times the expected count. So the 45-inning Mito game may be extremely rare indeed!

There is a 50% chance we will see a major league game go 27 innings or more in the next 60 years. There is a 95% chance we will see a major league game go 27 innings or more in the next 260 seasons. So the 84-year-old 26-inning major league record, while rare, is not so rare. We should expect to see it broken, quite possibly someday soon.

There is a 50% chance we will see a minor league game go 34 innings or longer in the next 523 years. There is a 95% chance we will see a minor league game go 34 innings or more in the next 2,257 years. So the 23-year-old 33-inning minor league record may be very rare, and although it could be broken at any time, we should not expect to see it broken anytime soon.

There is a 50% chance we will see an "other" category game go 46 innings or more in the next 59,975 years. There is a 95% chance we will see an "other" category game go 46 innings or more in the next 259,207 years, or nearly the age of mankind (about 300,000 years old). So the 21-year-old 45-inning "other" category record seems to be extremely rare indeed, and although it could be broken at any time, it is very conceivable it may never be broken.

SUMMARY

Some day in the future, a major league game will probably break the 26-inning barrier set over eight decades ago on May 1, 1920 by the Robins (now called the Dodgers) and Braves at Braves Field. And on some other day, perhaps in the far future, a minor league game may break the 33-inning record set over two decades ago on April 18 and June 23, 1981 by the Red Wings and Paw Sox in Pawtucket. But will a game ever break the 45-inning record set September 20, 1983 in Mito, Japan by Light Manufacturing and Tanaka Hospital? Only time will tell. As Enya sings it so well, "Who knows, only time."

As long as there is a "hot stove league," baseball fans will argue whether somewhere back in the murky uncharted depths of undocumented baseball history there may perhaps be a game that lasted longer than 45 innings. It is definitely possible. After all, I did 40 years and 11 months of research on this subject before I found the 45-inning game.

EPILOGUE

Of course, had Hank Webb's pickoff not been wild, or had Ron Hodges not dropped the ball, or had Ed Sudol ruled the sliding Bake McBride out at the plate, or had the rules on simultaneous balks and wild pickoff throws not been changed recently and McBride had been required to return to second in the top of the 25th at Shea on September 11, 1974, the Cards and Mets might still be playing! With nine hours of rest daily, five months off for winter, three hours per nine innings, 45 innings daily, and 9,450 innings annually, they would now be in the 31st year and roughly the 288,225 th inning of that game. And every seven innings, the fans would still be stretching and singing,

> Take me out to the ball game,
> Take me out with the crowd,
> Buy me some peanuts and Cracker Jack,
> I don't care if I EVER get back.

Appendix 1. CHRONOLOGICAL LIST OF EVERY MARATHON OF 20 OR MORE INNINGS

League Abbreviations

AA	American Assoc.	HUD	Hudson River	MXP	Mexican Pacific	PVL	Provincial
AAG	All-American Girls'	IA	International Assoc.	N1D	Nicaragua 1st Div. Amateur	QET	Quebec Eastern Townships
AL	American	IAS	Iowa State	N2D	Nicaragua 2nd Div. Amateur	RRV	Red River Valley
AMA	Amateur	ICA	Inter-Collegiate Assoc.	NA	Northern Assoc.	SA	Southern Assoc.
APP	Appalachian	III	IL/IN/IA (3-I)	NAI	NAIA	SAJ	Southern Alberta Jr.
ASN	Asian Under-19	IL	International	NAL	Negro American	SAL	South Atlantic (Sally)
AWL	American Women's	IML	Illinois-Missouri	NBC	National Baseball Congress	SCT	South Carolina Textile
BER	Bergen County	IND	Industrial	NCA	NCAA	SFG	South Florida Coast-Glades
BIG	Big State	INS	Independent School	NCS	North Carolina State	SL	Southern
BMA	Boston Men's Adult	INT	Inter-State	NEL	New England	SMA	Southern Michigan Assoc.
BUR	Burlington County	JC	NJCAA	NIS	Nicaragua Summer	SMP	Semipro
CA	Central Assoc.	JCL	Japanese Central	NIW	Nicaragua Winter	STR	Southern Tier
CAL	California	JFD	Japanese Federation	NL	National	TCL	Tri-County
CAR	Carolina	JPL	Japanese Pacific	NNL	Negro National	TRI	Tri-State
CAS	California State	JUL	Japanese University	NSL	Northern State	TT	Town Team
CCL	Cape Cod	KIT	KY/IL/TN (Kitty)	NSW	New South Wales Under-23	TUL	Taiwan University
CL	Central	KSS	Kansas State	NTH	Northern	TX	Texas
CSL	Central State	LAL	Lakeshore	NWL	Northwest	TXO	Texas-Oklahoma
CWL	Cuban Winter	LEG	American Legion	NWN	Northwestern	UPL	Upper Peninsula
EA	Eastern Assoc.	MIL	Military	NYP	New York-Penn	VAL	Virginia
EIL	Eastern Illinois	MIV	Mississippi Valley	OBL	Orange Belt	WA	Western Assoc.
EL	Eastern	MLJ	Montreal Ligue Junior	OHS	Ohio State	WAL	Western Australia
FLS	Florida State	MOL	Michigan-Ontario	OPL	Ohio-Pennsylvania	WIL	Wisconsin-Illinois
FRV	Fox River Valley	MOS	Missouri State	OSI	Ontario Sr. Intercounty	WIN	Western International
GAS	Georgia State	MOV	Missouri Valley	PCL	Pacific Coast	WIS	Wisconsin State
GRM	Grammar School	MWL	Midwest	PCR	Pigeon Creek	WL	Western
HJL	Hawai'i Japanese	MX	Mexican	PML	Piedmont	WVL	West Virginia
HS	High School	MXC	Mexican Center	PNW	Pacific Northwest	YAL	York-Adams
				PRW	Puerto Rico Winter		

Inn.	Park	Location	Date	League	Outcome
57	Boston Common	Boston, MA	5/21/1859	AMA	Natick Yankees 90 Boston Bay States 64 (5:57)
61		MA	6/18/1859	AMA	Ashland Alphas 101 Fayville 59, rain delay
22		Natick, MA	6/18/1859	AMA	Natick Yankees 36 Boston Bay States 7 (1:00), rain delay in top of 23rd inning
26	Young Ladies' Inst. Town Lot	Pittsfield, MA	7/1/1859	ICA	Amherst Lord Jeffs 73 Williams Ephs 32 (3:30)
211		Ashland, MA	7/28/1859 7/29/1859	AMA	Medway Unions 100 Upton Excelsiors 78 (14:10), 0:20 dinner delay, susp. after 10:10 and 85 inn.
101	Ag. Fair Grds.	Boston, MA	9/1859 9/1859	AMA	Medway Unions 100 Holliston Winthrops 71, susp. after 66 innings
80	Ag. Grounds	Worcester, MA	10/11/1859 10/12/1859	AMA	Upton Excelsiors 100 Medway Unions 56 (11:02), susp. after 6:02
30		Janesville, WI	8/10/1860	AMA	Croft's Team 50 Hogan's Team 34
172	Ag. Grounds	Worcester, MA	9/25/1860 9/26/1860 9/27/1860 9/28/1860 10/1/1860 10/4/1860 10/5/1860		Upton Excelsiors 50 Medway Unions 29 (21:50), dinner/rain delay 0:20 bottom 13th on 9/25, susp. after 2:40 and 12.5 innings, rain delay 2:30 bottom 13th on 9/26, susp. after 5:40 and 34.5 innings, lunch delay 0:20 on 9/27, susp. after 12:50 and 83.5 innings, susp. on 9/28 after 17:20 and 136.5 innings, scheduled to resume 10/1 in Springfield but did not, rain delay top 173rd on 10/4, susp. after 21:50 and 172 innings, rain delay top 173rd on 10/5
24	Holmes Field	Cambridge, MA	5/11/77	IA/ ICA	Manchester Pros 0 Harvard Crimson 0 (3:30)
22	11th St. Grounds	Tacoma, WA	5/16/91	PNW	Tacoma Daisies 6 Seattle Blues 5 (3:35)
25	ND State Militia Training Grounds	Devils Lake, ND	7/18/91	RRV	Grand Forks Black Stockings 0 Fargo Red Stockings 0 (4:10)
20	League Park (I)	Cincinnati, OH	6/30/92	NL	Colts 7 Reds 7 (3:20)
21	Lake View Park	Peoria, IL	6/26/98	WA	Peoria Blackbirds 8 St. Joseph Saints 4
20	Old Fair Grnds. Park	Springfield, MI	7/19/1902	MOV	Springfield Reds 2 Nevada Lunatics 1 (5:00)
20	Driving Park	Kingston, NY	8/10/1903	HUD	Hudson Marines 2 Kingston Colonials 2

Inn.	Park	Location	Date	League	Outcome
23	Goodwater Grove	Stockton, CA	7/2/1905	CAS	Stockton Millers 1 Lodi Crushers 0 (3:26)
20	Huntington Grds.	Boston, MA	7/4/1905	AL	Athletics 4 Americans 2 (3:31)
20	Huntingdon Grds.	Phila., PA	8/24/1905	NL	Cubs 2 Phillies 1 (4:00)
20	Electric Park	Monessen, PA	1906	AMA	Glassport Athletic 4 Monessen East Ends 3
24	Huntington Grds.	Boston, MA	9/1/1906	AL	Athletics 4 Americans 1 (4:47)
20		Joplin, MO	9/4/1906	WA	Joplin Miners 0 Webb City Gold Bugs 0 (3:15)
20	Washington Park	Lowell, MA	4/27/1907	NEL	Haverhill Hustlers 1 Lowell Tigers 1 (3:25)
23	Athletic Park	Hutchinson, KS	5/29/1907	WA	OK City Mets 2 Hutchinson Salt Packers 1 (3:10)
28	Dorchester Franklin Field #5	Boston, MA	6/8/1907	GRM	Pierce (Dorchester) 4 Bennet (Brighton) 3 (5:50)
21		Jacksonville, IL	6/26/1907	IAS	Jacksonville Lunatics 3 Burlington Pathfinders 2 (3:05)
30	Brookside Park	Cleveland, OH	7/4/1907	AMA	Brooklyn Athletic 4 East End All Stars 1 (5:50)
36	Rec. Park (I)	Columbus, OH	7/5/1907	AMA	Heintz Victors 2 Columbus Selects 2 (3:50)
23		Green Bay, WI	7/14/1907	WIS	Green Bay Orphans 2 La Crosse Badgers 1 (4:05)
20	Webb Park	Marion, OH	7/20/1907	OPL	Mansfield Pioneers 2 Marion Drummers 1 (2:18)
22	Ringwood Park	Clinton, IA	7/25/1907	III	Peoria Distillers 3 Clinton Infants 0 (3:10)
21		Johnstown, PA	8/8/1907	TRI	Johnstown Johnnies 4 Reading Pretzels 3 (3:45)
24	Wehrle Park	Newark, OH	8/23/1907	OPL	Sharon Giants 3 Newark Newks 2
20		Aberdeen, WA	5/6/1908	NWN	Butte Miners 3 Aberdeen Black Cats 3 (3:45)
22		Schaller, IA	6/4/1908	AMA	Sac City 3 Schaller 3
23	N. Corry Frgrds.	Corry, PA	6/25/1908	AMA	Falconer 3 Corry 1 (3:50)
20		MI	6/30/1908	SMA	Saginaw Wa-wa's 5 Jackson Convicts 4
21		Vincennes, IL	7/18/1908	EIL	Charleston Evangelists 4 Vincennes Alices 3
21	Athletic Grds.	Sheboygan, WI	7/19/1908	LAL	Sheboygan Chairmakers 1 Mil. White Sox 0 (3:40)
20	Vaughn St. Ballpark	Portland, OR	8/2/1908	PCL	San Francisco Seals 6 Portland Beavers 5 (3:40)
23		Fond du Lac, WI	8/4/1908	WIL	Oshkosh Indians 4 Fond du Lac Cubs 2 (3:40)
20		Jacksonville, IL	9/3/1908	CA	Jacksonville Lunatics 4 Ottumwa Packers 1 (2:50)
26	Bloomington Gds.	Bloomington, IL	5/31/1909	III	Decatur Commodores 2 Bloomington Bloomers 1 (4:20). rain delay 0:15 bottom 5th
24	Freeman's Park	San Fran., CA	6/8/1909	PCL	San Francisco Seals 1 Oakland Oaks 0 (3:35)
26	Athletic Park	Dixon, IL	6/25/1909	SMP	Dixon Browns 3 Muscatine Independents 2 (4:00)
21		McPherson, KS	7/27/1909	KSS	Lyons Lions 2 McPherson Merry Macks 1 (2:50)
22	Recreation Park	Vancouver, BC	7/31/1909	NWN	Portland Colts 3 Vancouver Beavers 0 (3:08)
21	Athletic Grounds	Sheboygan, WI	6/5/1910	LAL	Sheboygan Chairmakers 2 Port Washington 1
24		Clarksburg, WV	7/3/1910	WVL	Mannington Mountaineers 1 Clarksburg Bees 1
23	League Park	San Antonio, TX	7/5/1910	TX	Waco Navigators 1 San Antonio Bronchos 1 (4:14)
20		OH	7/10/1910	AMA	Amity 6 Danville 6 (5:00)
21	Springbrook Park	South Bend, IN	7/13/1910	CL	S. Bend Bronchos 1 Zanesville Potters 0 (3:35)
20		Muscatine, IA	7/16/1910	NA	Muscatine Pearl Finders 2 Sterling Infants 1
20		Kirksville, MO	5/25/11	MOS	Kirksville Osteopaths 2 Macon Athletics 1
24		Pottsville, PA	6/18/11	AMA	Reading Ruth Ath. 1 Pottsville Alerts 0 (4:00)
21		Ironwood, MI	8/6/11	UPL	Cary Empires 4 Ironwood Tigers 2 (4:05)
20	Panther Park	Fort Worth, TX	8/19/11	TXO/TX	Cleburne Railroaders 0 Fort Worth Panthers 0
24	Buffalo Park	Sacramento, CA	9/10/11	PCL	Portland Beavers 1 Sacramento Sacts 1 (3:45)
21	Washington Park	Los Angeles, CA	9/15/11	PCL	Sacramento Sacts 4 Los Angeles Angels 4 (3:10)
21	Beaumont Mill Field	Spartanburg, SC	6/15/12	SCT	Beaumont Mill 1 Inman Mill 0
20		PA	1912 or 1913	HS	East Berlin vs. New Oxford

Inn.	Park	Location	Date	League	Outcome
20		IL	6/19/13	IML	Champaign Velvets 6 Kankakee Kanks 5
20		Adrian, MI	7/17/13	SMA	Battle Creek Crickets 1 Adrian Champs 1
20	West Side Park	Jersey City, NJ	8/12/13	IL	Tor. Maple Leafs 0 Jersey City Skeeters 0 (3:20)
21		Kankakee, IL	5/25/14	IML	Streator Boosters 2 Kankakee Kanks 2
20	Washington Park	Los Angeles, CA	5/27/14	PCL	Oakland Oaks 4 Venice Tigers 2 (4:02)
20	Nicollet Park	Minneapolis, MN	6/9/14	AA	Mpls. Millers 3 Louisville Colonels 2 (3:31)
23		KS	7/3/14	KSS	Hutchinson Salt Packers 4 Great Bend Millers 3
23	Brewster Park	New Haven, CT	7/14/14	EA	Hartford Senators 2 N.H. White Wings 1 (3:55)
21	Forbes Field	Pittsburgh, PA	7/17/14	NL	Giants 3 Pirates 1 (3:42)
28		Delaw. City, OH	7/18/14	AMA	Columbus Champions 1 Delaware Stars 0
22		Sioux City, IA	7/19/14	WL	Wichita Wolves 3 Sioux City Indians 2 (4:48)
20	Dugdale Park (II)	Seattle, WA	7/19/14	NWN	Spokane Indians 6 Seattle Giants 1 (3:03)
20		NJ	6/15/15	BUR	Medford 0 Mount Holly 0
20		Charleston, WV	6/27/15	OHS	Lexington Colts 5 Charleston Senators 2 (3:25)
22	Athletic Park	Burlington, IA	6/27/15	CA	Keokuk Indians 0 Burlington Pathfinders 0 (3:50)
23	Wehrle Park	Newark, OH	7/4/15	AMA	Knights of Columbus 2 Athletics 2
21		Durham, NC	7/5/15	NCS	Raleigh Capitals 2 Durham Bulls 2
23		Norfolk, VA	8/14/15	VAL	Suffolk Tigers 2 Norfolk Tars 2 (3:40)
22		VA	9/4/15	VAL	Norfolk Tars 3 Suffolk Tigers 3
22	Douglas Park	Rock Island, IL	7/9/16	III	Hannibal Mules 8 Rock Island Islanders 3 (4:00)
20	Gulfview Park	Galveston, TX	8/13/16	TX	Waco Navigators 4 Galveston Pirates 1
21	Antelope Park	Lincoln, NE	8/12/17	WI	Lincoln Links 2 Joplin Miners 1 (3:38)
22	Ebbets Field	Brooklyn, NY	8/22/17	NL	Robins 6 Pirates 5 (4:15)
20		St. Joseph, MO	8/26/17	WL	Des Moines Boosters 4 St. Joe Drummers 3 (4:00)
20	Panther Park	Ft. Worth, TX	5/8/18	TX	Shreveport Gassers 1 Fort Worth Panthers 1
20		St. Joseph, MO	6/1/18	WL	Joplin Miners 3 St. Joseph Saints 1
21	Weeghman Park	Chicago, IL	7/17/18	NL	Cubs 2 Phillies 1 (4:00)
21	Braves Field	Boston, MA	8/1/18	NL	Pirates 2 Braves 0
20	Nat. Lg. Park (III)	Philadelphia, PA	4/30/19	NL	Robins 9 Phillies 9 (4:00)
23	Andrews Field	Chattanooga, TN	6/13/19	SL	Atlanta Crackers 2 Chatt. Lookouts 2 (3:40)
20	Sulphur Dell (I)	Nashville, TN	7/12/19	SL	Chattanooga Lookouts 6 Nashville Volunteers 5
20		Charlotte, NC	8/30/19	SAL	Columbia Comers 5 Charlotte Hornets 5
21	Savin Road Park	New Haven, CT	8/31/19	EL	Worcester Boosters 4 New Haven Weissmen 3
26	Braves Field	Boston, MA	5/1/20	NL	Robins 1 Braves 1 (3:50)
20	Hamilton Grounds	Hamilton, ON	6/17/20	MOL	London Cockneys 5 Hamilton Tigers 4
20	Hampden Park (II)	Springfield, MA	8/28/20	EL	Albany Senators 5 Springfield Hampdens 5
22	Washington Park	Los Angeles, CA	4/10/21	PCL	Seattle Rainiers 12 Los Angeles Angels 8 (4:46)
20	Hanlan's Point (III)	Toronto, ON	6/2/21	IL	Buffalo Bisons 3 Toronto Maple Leafs 2
22	Stonewall Jackson Park	Danville, VA	7/9/21	PML	High Point Furniture Makers 7 Danville Tobacconists 6
23		Rock Island, IL	8/4/22	MIV	Ottumwa Cardinals 4 Rock Island Islanders 2
20	Schorling's Park	Chicago, IL	8/16/22	NNL	Chi. American Giants 1 Bacharach Giants 0 (3:38)
20		Akron, OH	8/20/22	IND	Firestone 0 General Tire 0
21			5/18/23	NYP	Scranton Miners vs. Binghamton Triplets
20	Chadwick Park	Albany, NY	5/30/24	EL	Pittsfield Hillies 9 Albany Senators 8
20	Brown College Diamond	Providence, RI	6/7/24	NCA	Providence Friars 1 Brown Bears 0 (4:00)
20	Ace Park	Saginaw, MI	7/12/24	MOL	Flint Vehics 3 Saginaw Aces 2
23		CA	1926	HS	Pomona Red Devils 6 Fullerton Indians 5

Inn.	Park	Location	Date	League	Outcome
25		Pacific Jct., IA	8/14/26	AMA	Folsom 7 Pleasant Valley 4 (5:00)
22	Braves Field	Boston, MA	5/17/27	NL	Cubs 4 Braves 3 (4:13)
22	Oakland Baseball Park	Emeryville, CA	5/6/28	PCL	Oakland Oaks 7 Sacramento Senators 6 (4:00)
20	Knauertown HS Diamond	Knauertown, PA	6/2/28	TCL	Boyertown 9 Warwick Athletic Assn. 8 (3:30)
21	Comiskey Park (I)	Chicago, IL	5/24/29	AL	Tigers 6 White Sox 5 (3:31)
21	Miami Athletic Field	Oxford, OH	5/30/30	NCA	Miami Big Reds 2 Cincinnati Bearcats 1 (3:30)
20	Wrigley Field	Chicago, IL	8/28/30	NL	Cardinals 8 Cubs 7 (4:10)
20		IA	between 5/20/31 & 5/26/31	MIV	Cedar Rapids Bunnies defeated Dubuque Tigers
22		Elyria, OH	8/1/1932 8/8/1932	AMA	K of P's Team A 19 K of P's Team B 19 when susp., completed on 8/8 (unknown result)
25	Koshien Kyujyo	Osaka, Japan	8/19/33	HS	Chukyo-shogyo 1 Akashi-chugaku 0 (4:55)
21		Wauchula, FL	9/20/33	OBL	Wauchula 7 Frostproof 4 (4:00)
21	Tech Field	San Antonio, TX	6/2/35	TX	San Antonio Missions 4 Dallas Steers 3 (3:50)
20	Albemarle Field	York, PA	7/25/36	YAL	Albemarle Black Cats 3 New Oxford 2 (3:35)
25	Hoolulu Park	Hilo, HI	2/20/38	HJL	Papaikou 5 Shinmachi 5 (4:55)
20	Hook Ball Park	Paducah, KY	7/8/38	KIT	Fulton Eagles 14 Paducah Indians 9 (5:30)
21		Clintonville, WI	6/15/39	NSL	Clintonville FWD Truckers 1 Two Rivers Polar Bears 0 (5:15)
20	La Grave Field (I)	Fort Worth, TX	5/31/39	TX	Fort Worth Cats 4 Oklahoma City Indians 3 (4:25)
23	Bee Hive	Boston, MA	6/27/39	NL	Dodgers 2 Bees 2 (5:15)
20	Engel Stadium	Chattanooga, TN	6/21/40	SA	Little Rock Travelers 7 Chattanooga Lookouts 4
20	Bee Hive	Boston, MA	7/5/40	NL	Dodgers 6 Bees 2 (5:19)
21	Texas League Park	Oklahoma City, OK	9/5/40	TX	Dallas Rebels 2 Oklahoma City Indians 1 (3:58)
20		Japan	7/13/41	JFD	Taiyo 1, Hanshin 0 (2:43)
28	Korakuen Kyujyo	Tokyo, Japan	5/24/42	JFD	Taiyo 4 Nagoya 4 (3:47)
20	Swayne Field	Toledo, OH	7/11/42	AA	Louisville Colonels 6 Toledo Mud Hens 6 (4:25)
21	Oriole Park (III)	Baltimore, MD	4/23/43	IL	Toronto Maple Leafs 2 Baltimore Orioles 2
20	Estadio Gran Cerveceria Tropical	Havana, Cuba	12/2/43	CWL	Cienfuegos Elefantes 6 Marianao Frailes Grises 5 (4:25)
21		Guam	1944/5	MIL	Seabees vs. Rinkeydinks
20		South Bend, IN	7/14/45	MIL/ NCA	Notre Dame Fighting Irish 1 Indianapolis Stout Field Airmen 0
24	Shibe Park	Philadelphia, PA	7/21/45	AL	Tigers 1 Athletics 1 (4:48)
21	Artillery Park	Wilkes-Barre, PA	5/10/46	EL	Binghamton Triplets 5 Wilkes-Barre Barons 4 (4:35)
20	Comiskey Park (I)	Chicago, IL	5/12/46	NAL	Indianapolis Clowns 3 Chicago American Giants 3
21	Hartwell Field	Mobile, AL	8/8/46	SA	Atlanta Crackers 4 Mobile Bears 4 (4:30)
20	Lucky Beaver Stadium	Portland, OR	5/7/47	PCL	Portland Beavers 1 Sacramento Solons 0 (3:25)
20		NY	5/15/47	HS	Newtown 3 Bryant 2
21		Van Voorhis, PA	6/22/47	PCR	Bentleyville 4 Van Voorhis 4 (5:00)
22	Horlick Field	Racine, WI	7/31/47	AAG	South Bend Blue Sox 4 Racine Belles 3 (4:30)
20		Thetford Mines, QB	9/7/47	QET	Drummondville Forestiers Catholiques 3 St-Maurice de Thetford Mines Mineurs 3 (4:50)
21	Municipal Park	Sanford, FL	5/27/48	FLS	Sanford Giants 8 Palatka Azaleas 7 (5:15)
20	Playland Park	South Bend, IN	9/10/48	AAG	South Bend Blue Sox 3, Grand Rapids Chicks 2
23		Groton, NY	9/19/48	STR	Homer Braves 0 Groton 0 (4:30)
22	Marsh Field	Muskegon, MI	1949	AAG	Muskegon Lassies 1 Rockford Peaches 0 (3:02)
26	Estadio Nacionale	Managua, NG	7/10/49	N1D	Navarro Cubs 4 Escuelas Internacionales 3 (6:30)

Inn.	Park	Location	Date	League	Outcome
20	Municipal Stadium	San Jose, CA	8/7/49	CAL	Ventura Yankees 4 San Jose Red Sox 4 (4:20)
23	Municipal Stadium	Hagerstown, MD	9/3/49	INT	York White Roses 3 Hagerstown Owls 2 (4:25)
20	Redbird Stadium	Columbus, OH	9/3/49	AA	Columbus Redbirds 4 Louisville Colonels 3 (3:58)
27		Managua, NG	late 40s	N2D	Manta Nica defeated Schumann (6:13)
20		TX	7/13/50	BIG	Wichita Falls Spudders 2 Sherman-Denison Twins 1
22	Red Wing Stadium	Rochester, NY	8/13/50	IL	Roch. Red Wings 3 Jersey City Giants 2 (5:15)
21		Waterloo, ON	9/25/50	OSI	Waterloo Tigers 7 Brantford Red Sox 6
23	Royal Park	Victoria, BC	5/5/51	WIN	Salem Senators 1 Victoria Athletics 0 (4:03)
20		SD	1951	AMA	Watertown Lakers 10 Mansfield 9
20	Sherman Field	Lincoln, NE	7/19/51	WL	Wichita Indians 2 Lincoln Athletics 1 (4:22)
20	Bourne Dorm. Field	Pomfret, CT	5/10/52	INS	Pomfret Mannymen 4 St. George's Dragons 3 (4:55)
20	Triplets Field	Johnson City, NY	5/18/52	EL	Binghamton Triplets 4 Scranton Miners 3 (5:10)
21	Legion Park	Eastman, GA	5/27/52	GAS	Eastman Dodgers 6 Jesup Bees 5
21	Nishinomiya Kyujyo	Nishinomiya, JP	7/3/52	JCL/ JPL	CL All-Stars 2, PL All-Stars 2 (4:30)
20	East Texan Park	Tyler, TX	7/15/52	BIG	Texarkana Bears 3 Tyler East Texans 2 (4:21)
20		FL or GA	8/1/52	SAL	Jacksonville Tars 2 Columbus Cardinals 2 (4:55)
22	Texas League Park	Tulsa, OK	8/16/52	TX	Tulsa Oilers 6 Houston Buffalos 5 (4:43)
20		Japan	9/7/1952	JCL	Shochiku 2 Taiyo 1 (3:13)
21		Stuart, FL	5/24/53	SFG	Jupiter 1 Stuart 1
22		Japan	6/25/53	JPL	Daiei 4 Kintetsu 4 (4:33)
20	Memorial Ballpark	Atwater, CA	8/4/53	NBC	Fort Ord Warriors 2 SD Naval Air Stn. 1 (4:40)
22	Seals Stadium	San Fran., CA	8/5/53	PCL	Portland Beavers 4 San Francisco Seals 2 (4:20)
20		Japan	8/9/53	JPL	Kintetsu 5 Toei 4 (4:46)
21		CA	9/1953	SMP	Fort Ord Warriors defeated Santa Maria Indians
20	Golden Park	Columbus, GA	4/24/54	SAL	Macon Peaches 7 Columbus Cardinals 5 (5:13)
21	Gilmore Field	Hollywood, CA	5/12/54	PCL	Oakland Oaks 5 Hollywood Stars 1 (4:52)
22	Texas League Park	Tulsa, OK	5/13/54	TX	Tulsa Oilers 3 Dallas Eagles 2 (4:41)
20	Jennings Stadium	Augusta, GA	7/15/54	SAL	Macon Peaches 3 Augusta Rams 3 (4:40)
23		Japan	10/10/54	JPL	Kintetsu 1 Toei 0 (4:30)
20	Lucky Beaver Stadium	Portland, OR	4/24/55	PCL	Portland Beavers 3 San Diego Padres 2 (4:14)
20	Centennial Field	Burlington, VT	5/30/55	PVL	Thetford Mines Mineurs 4 Burlington Athletics 3 (4:54)
20	Paterson Field	Montgomery, AL	4/27/56	SAL	Augusta Tigers 6 Montgomery Rebels 4 (4:24)
21		Minster, OH	7/1956	LEG	St. Mary's 5 Lima 4
20	Disch Field	Austin, TX	9/7/56	TX	Austin Senators 4 Dallas Eagles 3 (5:01)
21	Tingley Field	Albuquerque, NM	5/3/57	WL	Albuquerque Dukes 5 Colorado Springs Sky Sox 3 (4:55)
21		Montello, WI	6/30/57	CSL	Montello 3 Redgranite Quarriers 2
20	Watt Powell Park	Charleston, WV	7/21/57	AA	Wichita Braves 8 Charleston Senators 6 (4:10)
25	Shikoku Kyujyo	Shikoku, Japan	4/28/58	HS	Takamatsu 2 Tokushima 0 (5:47)
21	Municipal Stadium	Jacksonville, FL	4/22/59	SAL	J'ville Braves 3 Knoxville Smokies 2 (5:01)
29	Nishi-Kyogoku Kyujyo	Kyoto, Japan	5/2/59	IND	Nippon Shinyaku 2 Kurashiki Reiyon 1 (6:14)
24	Mission Stadium	San Antonio, TX	4/29/60	TX	Rio Grande Valley Giants 4 San Antonio Missions 2 (5:42), scoreboard fire delay bottom 23rd
27		Mexico	7/17/60	MXC	Aguascalientes Tigres 5 Leon Diablos Rojos 4
20	Boysen Field	Anaheim, CA	4/1962	HS	Santa Ana Saints 6 Anaheim Colonists 6 (6:30)
20	Hoolulu Park	Hilo, HI	4/15/62	HS	Kau Trojans 3 St. Joseph Cardinals 2 (4:00)
22	Tiger Stadium	Detroit, MI	6/24/62	AL	Yankees 9 Tigers 7 (7:00)

Inn.	Park	Location	Date	League	Outcome
22	Korakuen Kyujyo	Tokyo, Japan	7/29/62	IND	Nippon Beer 1 Denden Kinki 0 (5:27)
20	Pyncheon Park	Springfield, MA	6/8/63	EL	York White Roses 2 Springfield Giants 1 (4:57)
21	Fairground Park	Fond du Lac, WI	7/31/63	FRV	Little Chute-Kimberly Papermakers 11 Fond du Lac 5 (6:01)
20	Municipal Park	Sanford, FL	4/17/64	EL/ NYP	Williamsport Mets at Auburn Mets
22	KY Wesleyan Field	Owensboro, KY	4/20/64	NCA	KYW Panthers 8 Oakland City Mighty Oaks 7 (6:30)
23	Shea Stadium	New York, NY	5/31/64	NL	Giants 8 Mets 6 (7:23)
27	Dunn Field	Elmira, NY	5/8/65	EL	Elmira Pioneers 2 Springfield Giants 1 (6:24)
21	Paramus HS Field (I)	Paramus, NJ	6/1965	BER	Spring Valley Bengals 0 Paramus Barons 0
25	Turnpike Stadium	Arlington, TX	6/17/65	TX	Austin Braves 2 Dallas-Fort Worth Spurs 1 (5:10)
21	Dunn Field	Elmira, NY	6/25/65	EL	Pittsfield Red Sox 1 Elmira Pioneers 1 (5:33)
21	College Stadium	Jamestown, NY	8/14/65	NYP	Binghamton Triplets 4 Jamestown Tigers 4 (6:13)
20	Fans Field	Decatur, IL	8/20/65	MWL	Decatur Commodores 1 Fox Cities Foxes 0 (4:25)
20		Havana, Cuba	12/28/65	CWL	Centrales vs. Orientales
29	Al Lang Field	St. Pete, FL	6/14/66	FLS	Miami Marlins 4 St. Pete Cardinals 3 (6:59)
21	Rox Park	St. Cloud, MN	7/25/66 8/28/66	NTH	Huron Phillies 8 St. Cloud Rox 2 (5:39), susp. after 4:20 and 16 innings
22	MacArthur Stadium	Syracuse, NY	8/24/66	IL	Syracuse Chiefs 5 Richmond Braves 4 (4:54)
23	Lawrence Hardball Park	Lodi, CA	8/31/66	CAL	Reno Silver Sox 6 Lodi Crushers 5 (6:00)
20	Lawrence Stadium	Portsmouth, VA	4/18/67	CAR	Kinston Eagles 5 Tidewater Tides 5 (5:20)
21		Fresno, CA	5/22/67	HS	Fresno McLane Highlanders 3 Fresno Warriors 2
22	D. C. Stadium	Washington, DC	6/12/67	AL	Senators 6 White Sox 5 (6:38)
25	Municipal Stadium	W.Palm Beach, FL	8/8/67	FLS	W. Palm Braves 3 Leesburg Athletics 2 (5:35)
20	Met Stadium	Bloomington, MN	8/9/67	AL	Senators 9 Twins 7 (5:40)
20	Yankee Stadium (I)	New York, NY	8/29/67	AL	Yankees 4 Red Sox 3 (6:09)
21	Crosley Field	Cincinnati, OH	9/1/67	NL	Giants 1 Reds 0 (5:40)
21	Estadio Angel Flores	Culiacan, MX	10/22/67	MXP	Obregon Yaquis 3 Culiacan Tomateros 1 (6:22)
24	Astrodome	Houston, TX	4/15/68	NL	Astros 1 Mets 0 (6:06)
20		NC	1969	LEG	Siler City Post vs. Bethel Post
22	Parque Deportivo del Seguro Social	Mexico City, MX	7/14/69	MX	Reynosa Broncos 5 Mexico City Diablos Rojos 3 (5:38)
20	Sicks' Stadium	Seattle, WA	7/27/69	AL	Red Sox 5 Pilots 3 (5:52)
24	Flamingo Park	Miami Beach, FL	4/23/70	HS	Miami Stingarees 1 Hialeah Thoroughbreds 0 (5:16)
23	All-Sports Stadium	Oklahoma City, OK	5/28/70 5/29/70	AA	Indianapolis Indians 10 Oklahoma City 89'ers 7 (6:37), susp. after 4:53 and 17 innings
22		Lexington, KY	6/3/70	HS	Madisonville Maroons 12 Lafayette Generals 11
20	Meiji Jingu Kyujyo	Tokyo, Japan	6/24/70	JUL	Kansai 3 Hosei 2 (4:54)
21	RFK Stadium	Washington, DC	6/4/71	AL	rain delay 0:17 at start, Athletics 6 Senators 3 (5:19)
22	Recreation Park	Visalia, CA	6/19/71 6/20/71	CAL	Visalia Mets 11 Bakersfield Dodgers 9 (7:00), susp. after 4:50 and 15 innings
20	Oakland Coliseum	Oakland, CA	7/9/71	AL	Athletics 1 Angels 0 (5:05)
22	Winder Field	Little Rock, AR	7/21/71	TX	AR Travelers 5 Dallas-Ft. Worth Spurs 4 (5:56)
20	Tadsen Field	Brownton, MN	9/10/71	TT	Hector Flyers 4 Stark 2 (5:30)
20	Cleveland Stadium RFK Stadium	Cleveland, OH Washington, DC	9/14/71 9/20/71	AL	Senators 8 Indians 6 (6:15), susp. after 5:00 and 16 innings in Cleveland, completed in Washington
21	San Diego Stadium	San Diego, CA	9/24/71	NL	Astros 2 Padres 1 (5:25)
20	Perry Field	Gainesville, FL	4/22/72	NCA	Auburn Tigers 7 Florida Gators 6 (4:35)

Fans leave D.C. (now R.F.K.) Stadium at 2:44 a.m. after the Senators' 22-inning defeat of the White Sox in the early morning of June 13, 1967. Because of this game, the American League adopted a 1:00 a.m. curfew. The National League has no curfew.

Inn.	Park	Location	Date	League	Outcome
20	Coleman Field	Corvallis, OR	5/6/72	NCA	Wash. Huskies 2 Oregon State Beavers 1 (4:38)
22	Met Stadium	Bloomington, MN	5/12/72 5/13/72	AL	Brewers 4 Twins 3 (5:47), susp. after 5:35 and 21 innings
20	University Field	Amherst, MA	5/13/72	NCA	Conn. Huskies 9 Mass. Minutemen 3 (5:10)
20		Havana, Cuba	1/21/73	CWL	Azucarerors vs. Camaguey
20	Blair Field	Long Beach, CA	3/30/73	NCA	Cal State San Jose Spartans 1 Cal State Long Beach 49ers 1 (3:35)
23	Grayson Stadium	Savannah, GA	4/14/73	SL	Columbus Astros 10 Savannah Braves 4 (6:14)
20	Veterans Stadium	Philadelphia, PA	5/4/73	NL	Phillies 5 Braves 4 (5:16)
20	Estadio Torreon	Torreon, Mexico	5/8/73	MX	Cordoba Cafeteros 2 Torreon Mineros 1
21		Mt. Olive, IL	5/23/73	HS	Mt. Olive Wildcats 0 Staunton Bulldogs 0 (4:05)
21	Comiskey Park (I)	Chicago, IL	5/26/73 5/28/73	AL	White Sox 6 Indians 3 (6:03), rain delay 0:17 top 14th, susp. after 4:39 and 16 innings
22	Husker Diamond	Lincoln, NE	4/26/74	NCA	Colorado Buffaloes 2 Nebraska Cornhuskers 1 (4:45)
21	Danville Stadium	Danville, IL	6/4/74	MWL	Waterloo Royals 7 Danville Warriors 5 (5:35)
25	Shea Stadium	New York, NY	9/11/74	NL	Cardinals 4 Mets 3 (7:04)
23		Havana, Cuba	1/4/75	CWL	Camaguey Granjeros vs. Camaguey Ganaderos, susp.

Inn.	Park	Location	Date	League	Outcome
20		IL	1975	HS	Homewood-Flossmoor Vikings vs. Olympia Fields Rich Central Olympians
21	Estadio Hiram Bithorn	San Juan, PR	12/26/75	PRW	Santurce Cangrejeros 5 Bayamon Vaqueros 2
22	Waterloo Stadium	Waterloo, IA	5/30/76	MWL	Burlington Bees 4 Waterloo Royals 3 (5:33)
20		Arlington, MN	8/26/76	TT	Cyrus 2 Fairfax Indians 1 (4:35)
22		Havana, Cuba	1/25/77	CWL	Vegueros vs. Santiago Mineros
23	Estadio Cordoba	Cordoba, Mexico	4/28/77	MX	Aguascalientes Rieleros 6 Cordoba Cafeteros 2 (6:30)
21	Stade Olympique	Montreal, QB	5/21/77	NL	Padres 11 Expos 8 (5:33)
21		AB	6/4/77	SAJ	Calgary Spikes 4 Medicine Hat Tigers 3
20	V. J. Keefe Stadium	San Antonio, TX	6/28/77	TX	San Antonio Dodgers 4 El Paso Diablos 3 (4:37)
21	Engel Stadium	Chattanooga, TN	7/29/78	SL	Chattanooga Lookouts 3 Savannah Braves 2 (5:32)
20	Estadio Aguilas	Mexicali, MX	1/2/79	MXP	Navojoa Mayos 1 Mexicali Aguilas 0
20		MS	1979	HS	Meridian Wildcats 4 Corinth Warriors 3
21	Municipal Stadium	Taipei, Taiwan	9/15/79	TUL	Weiquan 1 Putaowang Furen 0 (6:06)
21	Hickey Park	Russellville, AR	5/14/80	HS	Hazen Hornets 8 Tuckerman Bulldogs 7
20	Three Rivers Stadium	Pittsburgh, PA	7/6/80	NL	Pirates 5 Cubs 4 (5:31)
22	MacArthur Stadium	Syracuse, NY	7/30/80	IL	Richmond Braves 12 Syracuse Chiefs 6 (5:55)
20	San Diego Stadium	San Diego, CA	8/15/80	NL	Astros 3 Padres 1 (6:17)
20	Estadio Jesus Carranza	Guasave, MX	11/11/80	MXP	Mexicali Aguilas 3 Guasave Algodoneros 1.
33	McCoy Stadium	Pawtucket, RI	4/18/81 6/23/81	IL	Power failure delay 0:30 at start, Pawtucket Paw Sox 3 Rochester Red Wings 2 (8:25), susp. after 8:07 and 32 innings
20	Disch-Falk Field	Austin, TX	5/15/81 5/16/81	NCA	Texas Longhorns 7 Rice Owls 6 (6:07), rain delay 2:00 top 13th, susp. after 3:10 and 12 innings
20		Nicaragua	5/17/81	NIW	Corinto 5 Leon 4
23	Fort Lauderdale Stadium	Ft. Lauderdale, FL	5/24/81 5/25/81	FLS	Ft. Lauderdale Yankees 1 Tampa Tarpons 0 (5:32), susp. after 5:23 and 22 innings
20	Thunderbird Park	Cedar City, UT	5/1981	NAI	Mesa State Mavericks 9 NM Highlands Cowboys 8
20	McCoy Stadium	Pawtucket, RI	7/26/81	IL	Pawtucket Paw Sox 4 Richmond Braves 2
22	Parc Victor Gadbois	Montreal, QB	8/30/81	MLJ	St. Leonard Cougars 2 Sud-Ouest 1 (5:30)
20	Fenway Park	Boston, MA	9/3/81 9/4/81	AL	Mariners 8 Red Sox 7 (6:01), susp. after 5:39 and 19 innings
20	Anaheim Stadium	Anaheim, CA	4/13/82 4/14/82	AL	Angels 4 Mariners 3 (6:06), susp. after 5:24 and 17 innings
23	Smith-Wills Stadium	Jackson, MS	7/6/82	TX	Tulsa Drillers 11 Jackson Mets 7 (6:39)
21	War Memorial Stadium	Greensboro, NC	8/12/82 8/13/82	SAL	Greensboro Hornets 3 Gastonia Cardinals 2, susp. after 17 innings
21	Wrigley Field	Chicago, IL	8/17/82 8/18/82	NL	Dodgers 2 Cubs 1 (6:10), susp. after 5:10 and 17 innings
21	Community Field (II)	Burlington, IA	8/10/83 8/11/83	MWL	Burlington Rangers 7 Clinton Giants 6 (5:44), rain delay 0:06 bottom 11th, 2nd rain delay 0:01 bottom 18th, suspended after 4:54 and 17 1/2 innings
45	Ibaraki-Mito Kenai Kyujyo	Mito, JP	9/20/83	IND	Tokyo Raito Kogyo 2 Miyazaki Tanaka Byouin 1 (8:19), umpire snack break delay 0:06 top 26th, players refused 0:30 break top 26th
23		Nicaragua	12/18/83	NIW	Leon 5 Rivas 4
25	Comiskey Park (I)	Chicago, IL	5/8/84 5/9/84	AL	White Sox 7 Brewers 6 (8:06), susp. after 5:29 and 17 innings
21	J. C. Love Field	Ruston, LA	2/16/85	NAI/ NCA	Louisiana Tech Bulldogs 2 Southern Arkansas Muleriders 1 (4:54)

Inn.	Park	Location	Date	League	Outcome
21	Cooper Stadium	Columbus, OH	6/10/85 6/11/85 6/12/85	IL	Columbus Clippers 8 Syracuse Chiefs 7 (5:37), susp. after 5:18 and 20 innings, rained out 6/11, finally completed 6/12
27	MacArthur Stadium	Syracuse, NY	6/19/85 6/20/85 6/21/85	IL	Pawtucket Paw Sox 3 Syracuse Chiefs 1 (7:07), susp. after 5:44 and 22 innings, cont. 6/20, rain delay 0:13 top 23rd, 2nd rain delay 0:50 bottom 24th, susp. again after 6:07 and 23.5 innings, completed 6/21
21	Ft. Lauderdale Stadium	Ft Laud., FL	7/11/85	FLS	Miami Marlins at Fort Lauderdale Yankees
20	Mayo Field	Rochester, MN	5/10/86 5/20/86	HS	Rochester Mayo Spartans 3 Mankato East Cougars 2, rain delay bottom 10th, susp. after 9.5 inn.
20	Owen Bush Stadium	Indianapolis, IN	8/17/86	AA	Buffalo Bisons 6 Indianapolis Indians 5 (5:35)
32	Wynn Field	Bradenton, FL	4/4/87	JC	Hillsborough Hawks 6 Manatee Lancers 4 (7:30)
21	Keefe Stadium	San Antonio, TX	5/21/87	TX	Shreveport Captains 4 San Antonio Dodgers 3 (6:04)
22		Mobridge, SD	8/4/87	AMA	Mobridge 7 Redfield Pheasants 6 (5:47)
100		Silver Spring, MD	1988	HS	Springbrook Blue Devils, Varsity vs. JV (24:00), planned marathon
20	Al Lang Field Holman Stadium	St. Petersburg and Vero Beach, FL	4/29/88 ?/??/88	FLS	Vero Beach Dodgers at St. Petersburg Cardinals, susp. after 5:29 and 18 innings, completed in Vero Beach
21	Sports Complex	Riverside, CA	5/22/88	CAL	San Jose Giants 8 Riverside Red Wave 5 (6:19)
27	Athletic Stadium	Burlington, NC	6/24/88	APP	Bluefield Orioles 3 Burlington Indians 2 (8:16)
21	Riddle Park	Fayetteville, AR	7/10/88	SAL	Charleston (WV) Wheelers 7 F'ville Generals 5
26	Keefe Stadium	San Antonio, TX	7/14/88 7/16/88	TX	San Antonio Missions 1 Jackson Mets 0 (7:23) susp. after 7:10 and 25 innings
21	Estadio Emilio Ibarra	Los Mochis, MX	11/26/88	MXP	Los Mochis Caneros 4 Mazatlan Venados 2 (7:14)
23	Parque Yldefonso Sola Morales	Caguas, PR	1/8/89 1/9/89	PRW	Mayaguez Indios 4 Caguas Criollos 3, susp.
22	Parry Field	Belmont, AU	3/17/89	WAL	Melville Braves 6 Morley Eagles 2 (5:23)
21	Smith Stadium Dunedin Stadium	Sarasota, FL Dunedin, FL	4/24/89 5/17/89	FLS	Dunedin Blue Jays 8 Sarasota White Sox 3 (6:29), susp. after 5:48 and 20 innings in Sarasota, completed in Dunedin
20	Community Field (II)	Burlington, IA	5/15/89	MWL	Rockford Expos 4 Burlington Braves 2 (5:04)
22	Astrodome	Houston, TX	6/3/89	NL	Astros 5 Dodgers 4 (7:14)
25	Waterloo Stadium Riverview Stadium	Waterloo, IA Clinton, IA	7/6/89 8/17/89	MWL	Waterloo Diamonds 4 Clinton Giants 3 (7:37), susp. after 5:46 and 19 innings in Waterloo, completed in Clinton
21	Diamond	Richmond, VA	8/7/89	IL	Toledo Mud Hens 4 Richmond Braves 1 (5:01)
25	Memorial Stadium Civic Stadium	Everett. OR Eugene, OR	8/18/89 8/24/89	NWL	Eugene Emeralds 6 Everett Giants 5 (7:13), susp. after 5:50 and 19 innings, completed in Eugene
22	Stade Olympique	Montreal, QB	8/23/89	NL	Dodgers 1 Expos 0 (6:14)
20	Kechi Lagoon Park	Honolulu, HI	4/13/90	NAI	Hawai'i Pacific Sea Warriors 6 Idaho Coyotes 5
20	Municipal Stadium	Phoenix, AZ	6/23/90	PCL	Calgary Cannons 12 Phoenix Firebirds 9 (6:39)
20	Greer Stadium	Nashville, TN	9/7/90	AA	Omaha Royals 8 Nashville Sounds 7 (6:25), rain delay 1:46 bottom 11th
20	McCarver Stadium	Memphis, TN	6/17/91 6/18/91	SL	Huntsville Stars 9 Memphis Chicks 7 (6:32), susp. after 5:33 and 16 innings
22	Ojiyama Kyujyo	Otsu, Japan	5/4/93	JUL	Kihara 3 Chikaoka 2 (4:45)
20	Al Lang Field	St. Pete, FL	6/8/93	FLS	Lakeland Tigers at St. Petersburg Cardinals
20	Smith Stadium	Sarasota, FL	6/17/93	FLS	Sarasota White Sox 3 Clearwater Phillies 2 (4:47)
20	Veterans Stadium	Philadelphia, PA	7/7/93	NL	Phillies 7 Dodgers 6 (6:10)
22	Metrodome	Minneapolis, MN	8/31/93	AL	Twins 5 Indians 4 (6:17)
22	Estadio Mariscal	Mazatlan, MX	10/26/93	MXP	Mazatlan Venados 2 Guasave Algodoneros 1 (7:02)

Inn.	Park	Location	Date	League	Outcome
24		Havana, Cuba	12/8/93 12/9/93	CWL	Matanzas vs. Habana, susp.
20	Al Lang Field	St. Pete, FL	4/14/94	FLS	St. Pete Cardinals 8 Lakeland Tigers 7 (7:07)
25	Parque Yldefonso Sola Morales	Caguas, PR	11/23/94 12/10/94	PRW	Mayaguez Indios 4 Caguas Criollos 3, susp. after 16 innings
20	Oaks Oval	Lismore, AU	12/31/94	ASN	Australia 9 Chinese Taipei 8 (6:17)
21	Municipal Stadium	San Jose, CA	5/12/95 5/13/95	CAL	San Bernardino Spirit 1 San Jose Giants 0, susp.
23	Legion Field	Downers Grove, IL	4/28/95 5/3/95 5/8/95 5/12/95	HS	Downers Grove North Trojans 12 Elmhurst York Dukes 11 (7:00), susp. after 3:00 and 10 innings, susp. a 2nd time after 6:00 and 20 innings on 5/3, rained out 5/8
20	Estadio Angel Flores	Culiacan, MX	10/27/95	MXP	Culiacan Tomateros 3 Mazatlan Venados 2 (6:01)
24	Estadio Isidoro "Cholo" Garcia	Mayaguez, PR	12/22/95 12/23/95 1/19/96	PRW	Mayaguez Indios 2 San Juan Senadores 1, susp. twice
21	Blue Valley Center	Overland Park, KS	5/20/97	HS	Blue Valley Northwest Huskies 1 Shawnee Mission North Mustangs 0 (5:50)
21	Judy Johnson Field	Wilmington, DE	7/5/98	CAR	Wilmington Blue Rocks 3 Danville 97's 2 (6:23)
23	Municipal Stadium	Greenville, SC	8/6/98 8/7/98	SL	Greenville Braves 10 Huntsville Stars 7 (6:26), susp. after 5:25 and 19 innings
21	Heart of Florida Medical Center Field	Babson Pk., FL	2/19/99 2/20/99	NAI	Nova Southeastern Knights 9 Webber Warriors 8 (6:00), susp. after 3:43 and 13 innings
22	Cougar Field	Houston, TX	2/21/99	NCA	Baylor Bears 8 Houston Cougars 2 (6:43)
21	Carson Center Field	Evansville, IN	3/7/99	NCA	Memphis Tigers 4 Evansville Purple Aces 4 (5:00)
21	O'Donnell Stadium	Davenport, IA	5/19/99	MWL	Clinton Lumber Kings 3 Quad-City River Bandits 2 (5:49)
100		Ft. Sheridan, IL	9/1999	HS	Green Sox vs. Snappers (24:00), planned marathon
20	Frans Stadium	Hickory, NC	8/13/2000	SAL	Asheville Tourists 4 Hickory Crawdads 3 (5:16)
21		Brunswick, OH	5/9/2001 5/10/2001	HS	Brunswick 11 Elyria Pioneers 10
23	Estadio Veracruz	Veracruz, MX	6/30/2001	MX	Mexico City 2 Veracruz Aguila 1
22	Estadio Clemente	Carolina, PR	11/4/2001	PRW	Carolina Giantes 2 Caguas Criollos 1 (6:30)
23	Fukuoka Dome	Fukuoka, Japan	10/26/2002	JUL	Nihon Bunri 2 Kyushu Kyoritsu 1 (6:00)
22	Blacktown Olympic Park	Sydney, AU	4/19/2003	NSW	Queensland 4 Combined Academy 3 (5:33)
20	Pro Player Stadium	Miami, FL	4/27/2003	NL	Cardinals 7 Marlins 6 (6:07)
21	Dwyer Stadium	Batavia, NY	7/9/2003	NYP	Staten Island Yankees 5 Batavia Muckdogs 2 (5:48)
20	Eldredge Park	Orleans, MA	8/4/2003	CCL	Harwich Mariners 3 Orleans Cardinals 2 (5:52)
79	Carroll Field	Wichita, KS	10/5/2003	NAI	Red Team 15 Black Team 14 (8:00), planned marathon
65	Electric Park	Tucson, AZ	10/18/2003 10/19/2003	AWL	African Gray Birds 127 Red-Eyed Nites 110 (24:12), planned marathon
20	Myers Field	Manhattan, KS	4/9/2004	NCA	Texas Longhorns 10 Kansas State Wildcats 6 (6:28)
101	Kelly Field	Hyde Park, MA	4/17/2004 4/18/2004	BMA	Gehrig's Stamina 100 Schilling's Endurance 51 (30:45), planned marathon
24		Norridge, IL	5/18/2004 5/25/2004	HS	Evergreen Park Mustangs 1 Ridgewood Rebels 0, susp. after 12 innings
21	Wolff Stadium	San Antonio, TX	8/14/2004	TX	Midland RockHounds 7 San Antonio Missions 5 (6:40)
23	Dust Devils Stadium	Pasco, WA	8/16/2004 8/17/2004	NWL	Spokane Indians 2 Tri-City Dust Devils 1 (6:37), susp. after 5:46 and 20 innings
100	Carroll Field Love Field	Wichita, KS	10/10/2004 10/12/2004	NAI	Red Team 20 Black Team 17 (8:30), susp. due to rain after 5:00 and 64 innings, planned marathon

Appendix 2. RUNS SCORED PER INNING

For all games, tabulated by inning for innings 1-45, based on Dave Smith's major league data for innings 1-19 and Phil Lowry's 20 innings and more data for innings 20-45.

For just games lasting 20 or more innings, tabulated by inning for innings 10-45, based on Lowry data for all games which have gone 20 or more innings and have a box score:

Inning	Half-Inning Datapoints	Runs per Half Inning	Inning	Half-Inning Datapoints	Runs per Half Inning	Inning	Half-Inning Datapoints	Runs per Half Inning
1	245,812	.561	23	96	.250	10	412	.019
2	245,812	.431	24	62	.145	11	412	.039
3	245,812	.491	25	48	.167	12	412	.024
4	245,812	.497	26	32	.156	13	412	.019
5	245,812	.491	27	24	.250	14	412	.010
6	245,446	.507	28	18	.111	15	412	.029
7	244,856	.493	29	14	.143	16	412	.005
8	244,088	.486	30	10	.300	17	412	.015
9	243,394	.433	31	8	.250	18	412	.034
10	23,026	.399	32	8	.250	19	412	.063
11	12,906	.398	33	6	.167	20-45	see above	see above
12	7,220	.385	34	4	.000			
13	4,044	.396	35	4	.500			
14	2,282	.397	36	4	.000			
15	1,240	.392	37	2	.000			
16	704	.380	38	2	.000			
17	378	.384	39	2	.000			
18	202	.302	40	2	.000			
19	116	.440	41	2	.000			
20	404	.279	42	2	.000			
21	246	.319	43	2	.000			
22	154	.314	44	2	.000			
			45	2	.500			

Appendix 3. THEORETICAL VS. EMPIRICAL CHANCES OF MAJOR LEAGUE GAMES GOING X NUMBER OF INNINGS

Here are the statistical probabilities any given major league game will take 10 innings, etc., up to 50 innings, assuming each team scores 0.487 runs per inning, and the value of k, the probability both teams score the same number of runs in any given inning, is 0.5559 (55.59%).

Innings	Empirical Probability	Theoretical Probability	Innings	Empirical Probability	Theoretical Probability
10	4.11696 %	4.574 %	31	0	0.00002018
11	2.31314	2.543	32	0	0.00001122
12	1.29204	1.414	33	0	0.000006236
13	0.71681	0.7857	34	0	0.000003466
14	0.42390	0.4368	35	0	0.000001927
15	0.21805	0.2428	36	0	0.000001071
16	0.13262	0.1350	37	0	0.0000005954
17	0.07160	0.07502	38	0	0.0000003309
18	0.03499	0.04170	39	0	0.0000001839
19	0.02034	0.02318	40	0	0.0000001023
20	0.01013	0.01289	41	0	0.00000005685
21	0.00506	0.007163	42	0	0.00000003160
22	0.00405	0.003982	43	0	0.00000001757
23	0.00101	0.002214	44	0	0.000000009765
24	0.00152	0.001230	45	0	0.000000005428
25	0.00101	0.0006839	46	0	0.000000003018
26	0.00051	0.0003802	47	0	0.000000001677
27	0	0.0002114	48	0	0.0000000009324
28	0	0.0001175	49	0	0.0000000005183
29	0	0.00006531	50	0	0.0000000002881
30	0	0.00003631			

Underestimating the Fog

If this was a real scientific journal and I was a real academic, the title of this article would be *The Problem of Distinguishing Between Transient and Persistent Phenomena When Dealing with Variables from a Statistically Unstable Platform*. But I was hoping somebody might actually read it.

I have come to realize, over the last three years, that a wide range of conclusions in sabermetrics may be unfounded, due to the reliance on a commonly accepted method which *seems*, intuitively, that it ought to work, but which in practice may not actually work at all. The problem has to do with distinguishing between transient and persistent phenomena, so let me start there.

If you make up a list of the leading hitters in the National League in 1982 (or any other year) and check their batting averages in 1983 (or the follow-up year, whatever it is) you will quite certainly find that those hitters hit far better than average in the follow-up season. If you look at the stolen base leaders in the National League in 1982, you will find that those players continued to steal bases in 1983. If you look at the Hit By Pitch Leaders in 1982, you will find that those players continued to be hit by pitches in 1983. That is what we mean by a persistent phenomenon—that the people who are good at it one year are good at it the next year as well.

If the opposite is true—if the people who do well in a category one year do *not* tend to do well in the same category the next year—that's what we mean by a transient phenomenon. Here today, gone tomorrow.

All "real" skills in baseball (or anything else) are persistent at least to some extent. Intelligence, bicycle riding, alcoholism, income-earning capacity, height, weight, cleanliness, greed, bad breath, the ownership of dogs or llamas and the tendency to vote Republican . . . all of these are persistent phenomena. Everything real is persistent to some measurable extent. Therefore, if something *cannot* be measured as persistent, we tend to assume that it is not real.

There are, in sabermetrics, a very wide range of things

BILL JAMES has been a member of SABR for many years, and is the author of more baseball books than anybody really needs. He is now Senior Baseball Operations Advisor for the World Champion Boston Red Sox.

which have been labeled as "not real" or "not of any significance" because they cannot be measured as having any persistence. The first of these conclusions—and probably the most important—was Dick Cramer's conclusion in the 1977 *Baseball Research Journal* (SABR) that clutch hitting was not a reliable skill. Using the data from the "Player Win Averages" study by E. G. Mills and H. D. Mills of the 1969 and 1970 seasons, Cramer compared two things—the effectiveness of all hitters in general, and the impact of hitters on their team's won-lost record, as calculated by the Mills brothers. Those hitters who had more impact on their team's won-lost record than would be expected from their overall hitting ability were clutch hitters. Those who had less impact than expected were. . .well, non-clutch hitters, or whatever we call those. There are a number of uncomplimentary terms in use.

"If clutch hitters really exist," wrote Cramer, "one would certainly expect that a batter who was a clutch hitter in 1969 would tend also to be a clutch hitter in 1970. But if no such tendency exists, then 'clutch hitting' must surely be a matter of luck." Cramer found that there was no persistence in the clutch-hitting data—therefore, that clutch performance was a matter of luck. "I have established clearly," wrote Cramer, "that clutch hitting cannot be an important or a general phenomenon."

The argument triggered by this article continues to boil, and has now reached the point at which even *Sports Illustrated* is willing to discuss clutch hitting as an open question, at least for one article. But I am not writing about clutch hitting; I am talking about the method. Cramer's article was very influential. Subsequent to this article, I used a similar method to "demonstrate" that a wide variety of supposed "skills" of baseball players were actually just random manifestations of luck, and many other people have done the same. The list of conclusions which have been bulwarked by this method would be too long to include here, but among them are:

1. There is no such thing as an "ability to win" in a pitcher, as distinguished from an ability to prevent runs. A pitcher who goes 20-8 with a 3.70 ERA is no more likely to win 20 games in the following season than a pitcher who goes 14-14 with a 3.70 ERA on the same team.
2. Winning or losing close games is luck. Teams which win more one-run games than they should one year have

little tendency to do so the next year.

3. Catchers have little or no impact on a pitcher's ERA. Whether a pitcher pitches well with a given catcher or does not appears to be mostly luck.

4. A pitcher has little or no control over his hits/innings ratio, other than by striking batters out and allowing home runs. A high hits/innings ratio, if the pitcher has a normal strikeout rate, is probably just bad luck.

5. Base running, like clutch hitting, has no persistent impact on a team's runs scored, other than by base stealing. If a team scores more runs than they ought to score based on their hits, home runs, walks, etc., it is probably just luck.

6. Batters have no *individual* tendency to hit well or hit poorly against left-handed pitching. There is a very strong *group* tendency for all right-handed hitters to hit well against left-handed pitchers, but individual deviations from the group tendency have a persistence of zero, therefore are not meaningful.

7. Batters do not get "hot" and "cold." Hot streaks and cold streaks are just random clusters of events.

8. A quality hitter in the middle of the lineup has little or no impact on the hitters surrounding him. A good hitter will not hit appreciably better with Manny Ramirez in the on-deck circle than he will with Rey Ordonez on deck.

I will revisit these issues later in the article. For now, trying again to keep clear what I am saying and what I am not. I am not saying that these conclusions are false. What I am saying, and will try to demonstrate beginning in just a moment, is that a method used to reach these conclusions is unreliable to the point of being useless—therefore, that some of these conclusions may be wanting in proof. Let me pick up the sixth item listed above, since, as far as I know, I was the only person ever to make this argument, and therefore there is in that case the least chance that someone will take offense when I try to demonstrate the error.

In the 1988 *Baseball Abstract* (pages 9-15), I tried to do a thorough analysis of platoon data—data for left-handed hitters against right-handed pitchers, etc. I asked a series of questions about the platoon differential, and tried to work systematically through the data toward the answers.

One of the conclusions of that article was: "The platoon differential is not a weakness peculiar to some players. It is a condition of the game." I based this conclusion on the following research and logic. Suppose that you identify, in last year's platoon data, two groups of players: those who had the *largest* platoon differentials, and those who hit better the wrong way

(that is, left-handed hitters who hit better against left-handed pitchers, and right-handed hitters who hit better against right-handed pitchers). Suppose that you then look at how those players hit in the *following* season. You will find that there is no difference or no reliable difference in their following-year platoon differentials. The players who had huge platoon differences in Year 1 will have platoon differences in Year 2 no larger than the players who were reverse-platoon in Year 1.

Individual platoon differences are transient, I concluded, therefore not real. Individual platoon differences are just luck. There is no evidence of individual batters having a special tendency to hit well or hit poorly against left-handed pitchers, except in a very few special cases.

As recently as two years ago I still believed this to be true, although (fortunately) I never succeeded in convincing anybody. The observation was useful, in a sense, because many people pay far more attention to platoon splits for individual hitters than is justified by an understanding of the data—but, in a literal sense, I simply was not correct. Individual batters do have individual platoon tendencies, in many more cases than I at first concluded.

Given a few paragraphs, I could explain how I finally realized that I must be wrong, and how I finally demonstrated that I was wrong, but that's a little bit outside the present article. In any case, this forced me to consider seriously where I had gone astray. My conclusion, which is the basis of this article, was that the "zero persistence equals luck" type of study poses much greater risk of error than I had previously understood.

Suppose that we have two players, whom we will call Allen and Bob. Allen and Bob are both right-handed hitters. Allen hits .290 against right-handed pitchers but .340 against left-handers. Bob hits .290 against right-handed pitchers but .250 against lefties.

From this we attempt to derive a third measurement, which is the player's *platoon differential*. Allen's platoon differential is .050 (.340 minus .290); Bob's is negative .040 (.250 minus .290). The platoon differential is what we could call a *comparison offshoot*—a measurement derived from a comparison of other measures.

The first problem with comparison offshoots is that they have the combined instability of all of their components. Every statistic in baseball is to a certain degree a measurement of a skill, to a certain degree a statement about the circumstances, and to a certain degree simply a product of luck. A pitcher goes 20-8—he goes 20-8 to a certain degree because he is a good pitcher, to a certain degree because he pitches for a good team, and to a certain degree because he is lucky (or unlucky). There is luck in everything, and baseball fans are always engaged in

a perpetual struggle to figure out what is real and what is just luck.

In the case of any one statistical record, it is impossible to know to what precise extent it reflects luck, but a player usually bats only 100 to 200 times a year against left-handed pitchers. Batting averages in 100 or 200 at-bats involve huge amounts of luck. If a player hits .340 against lefties, is that 20% luck, or 50% luck, or 80% luck? There is no way of knowing—but batting averages in 100-150 at-bats are immensely unstable. Walter Johnson hit .433 one year in about 100 at-bats; the next year he hit .194. Just luck.

It is hard to distinguish the luck from the real skill, but as baseball fans we get to be pretty good at it. The problem is, that .290 batting average against right-handed pitchers—that also involves a great deal of luck.

When we create a new statistic, platoon *differential*, as a comparison offshoot of these other statistics, the new statistic embodies all of the instability—all of the luck—combined in *either* of its components. Suppose that you take two statistics, each of which is 30% luck, and you add them together. The resulting new statistic will still be 30% luck (understanding, of course, that the 30% number here is purely illustrative, and has no functional definition).

But when you take two statistics, each of which is 30% luck, and you *subtract* one from the other (or divide one by the other), then the resulting new statistic—the comparison offshoot—may be as much as 60% luck. By contrasting one statistic with another to reach a new conclusion, you are picking up all of the luck involved in either of the original statistics.

But wait a minute—the problem is actually much, much more serious than that. A normal batting average for a regular player is in the range of .270. A normal platoon differential is in the range of 25 to 30 points—.025 to .030.

Thus, *the randomness is operating on a vastly larger scale than the statistic can accommodate.* The new statistic—the platoon differential—is operating on a scale in which the norm is about .0275—but the randomness is occurring on a scale ten times larger than that. The new statistic is on the scale of a Volkswagen; the randomness is on the scale of an 18-wheeler. In effect, we are asking a Volkswagen engine to pull a semi.

But wait a minute, the problem is still worse than that. In the platoon differential example, I reached the conclusion I did by comparing *one* comparison offshoot with a *second* comparison offshoot—the platoon differential in one year with the platoon differential the next year. Dick Cramer, in the clutch-hitting study, did the same thing, and catcher-ERA studies, which look for consistency in catcher's impact on ERAs, do the same thing; they compare one comparison offshoot with a second compari-

son offshoot. It is a comparison of two comparison offshoots.

When you do that, the result embodies not just all of the randomness in *two* original statistics, but all of the randomness in *four* original statistics. Unless you have extremely stable "original elements"—original statistics stabilized by hundreds of thousands of trials—then the result is, for all practical purposes, just random numbers.

We ran astray because we have been assuming that random data is proof of nothingness, when in reality random data proves nothing. In essence, starting with Dick Cramer's article, Cramer argued, "I did an analysis which *should* have identified clutch hitters, if clutch hitting exists. I got random data; therefore, clutch hitters don't exist."

Cramer was using random data as proof of nothingness—and I did the same, many times, and many other people also have done the same. But I'm saying now that's not right; random data proves nothing—and it *cannot* be used as proof of nothingness.

Why? Because whenever you do a study, if your study completely fails, you will get random data. Therefore, when you get random data, *all* you may conclude is that your study has failed. Cramer's study may have failed to identify clutch hitters because clutch hitters don't exist—as he concluded—or it may have failed to identify clutch hitters because the method doesn't work—as I now believe. We don't know. All we can say is that the study has failed.

Dealing now with the nine conclusions listed near the start of the article, which were:

1. Clutch hitters don't exist.
2. Pitchers have no ability to win, which is distinct from an ability to prevent runs.
3. Winning or losing close games is luck.
4. Catchers have little or no impact on a pitcher's ERA.
5. A pitcher has little or no control over his hits/innings ratio, other than by striking batters out and allowing home runs.
6. Base running has no persistent impact on a team's runs scored, other than by base stealing.
7. Batters have no *individual* tendency to hit well or hit poorly against left-handed pitching.
8. Batters don't get hot and cold.
9. One hitter does not "protect" another in a hitting lineup.

On (1), it is my opinion that this should be regarded as an open question. While Dick Cramer is a friend of mine, and I have tremendous respect for his work, I am convinced that, even if clutch-hitting skill did exist and was extremely important, this

analysis would still reach the conclusion that it did, simply because it is not possible to detect consistency in clutch hitting by the use of this method.

There have been other studies of the issue (including several by me) which have reached the same conclusion, but these were in essence repeats of the Cramer approach. If that approach doesn't work once, it's not going to work the second time, the third, or the fourth. It just doesn't work. We need to find some more affirmative way to study the subject.

On (2) above (pitchers have no ability to win, which is distinct from an ability to prevent runs), this, I think, has been a very useful observation over the years, and it now has an additional claim to being true, which is: many predictions have been made based on this assumption which later proved to be accurate.

Simple example: in 2002, Dan Wright went 14-12 with a 5.18 ERA for the Chicago White Sox. It's a data mismatch; a 5.18 ERA should not produce a 14-12 record. Anyone in sabermetrics would immediately recognize this as a strong indication that Wright would *not* be able to continue to win in 2003—and in fact he couldn't, finishing the season 1-7. We have made hundreds of observations/predictions of that nature based on this understanding, and most of these have proven correct. I'm not even going to bring up Storm Davis. Therefore, we probably would not wish to abandon the insight simply because the original proof thereof was faulty.

However, I would have trouble now with my original argument that the pitcher has *no* ability to win, other than what is reflected in his runs allowed. There may in fact be *some* ability to win, in the way the old-time baseball guys imagined that there was. There may be some pitchers who have some ability to win games 3-2 and 9-8. Sabermetrics has traditionally discounted the existence of this ability at *any* level. I would now argue that it may exist at some fairly low level.

On (3) above (winning and losing close games is luck) . . . it would be my opinion that it is probably not *all* luck.

On (4) above (catchers have little or no impact on a pitcher's ERA), I don't think that there is a scintilla of evidence that that is true. It is my opinion that it is impossible to evaluate a catcher's defensive contribution by a comparison based on catcher's ERAs.

Many of the pitcher/catcher combinations which have been studied to reach this conclusion worked together for 40 or 50 innings. ERAs in less than 100 innings pitched have immense instability due to randomness. Further, since the catcher's defensive skill is only one of many, many factors in the prevention of runs, the randomness occurs on a scale which must be 20 times larger than the scale on which the catcher's ERA

contribution must be measured—even if you assume that the catcher's defensive contribution is very large.

Obviously, if a catcher makes a defensive contribution, this must result in a lower ERA for his pitchers. It *seems*, intuitively, that this difference would *have* to be visible in the stats at least at some level, that there would at least have to be *some* measurable consistency in the data. That intuitive sense is what misled me, on this issue, for 25 years. But, in fact, it doesn't. There is so much instability in the data that the catcher's defensive contribution simply cannot be isolated in this form.

On (5) above (the Voros McCracken observation), this seems to me different from the others, for this reason. Voros's observation relies on something which is near to a historical constant. When a ball is in play—not a home run, not a strikeout, not a walk—that ball will be turned into an out about 70% of the time. That is the nature of the game. OK, it's 72% for some teams; it's 67% for other teams; it's 69.5% in some years, it's 68.8% in others. But it doesn't vary crazily from team to team or park to park, and it's really about the same now as it was in 1930 or 1960.

This creates something close to a "stable platform" against which to measure the individual variable, and this makes an important difference. What Voros was saying, in essence, was: "When you see a pitcher who gets outs on 75% of his balls in play, he's just been lucky, because *no pitcher can actually do that*. It's not the nature of the game." This may have been overstated by some people sometimes, but I have little doubt that this observation is more true than false.

On (6) above (base running has no persistent impact on a team's runs scored, other than by base stealing), that's probably not true, and that's probably mostly my error, again. Base running can be measured in simple, objective terms—bases gained, base running errors, etc. A much better way to think about the problem is to measure those things and study what impact they have on runs scored, rather than starting with the proposition that they are probably not meaningful.

On (7) (batters have no *individual* tendency to hit well or hit poorly against left-handed pitching), that, as I said, was just wrong. My mistake.

On (8), this almost becomes a brain teaser. Most baseball fans believe that players get "hot" and "cold." Many analysts believe (and a popular web site is devoted to proving) that this is nonsense, that hot streaks and cold streaks are just random clusters.

Everyone agrees that a hot streak is a transient phenomenon. Therefore, why doesn't everyone agree that it is a non-real phenomenon—a random sequence?

Because people believe that there is *some* persistence to

the transient phenomenon—in other words, that the persistence is not zero.

My opinion is that, at this point, no one has made a compelling argument either in favor of or against the hot-hand phenomenon. The methods that are used to prove that a hot hitter is not really hot, in my opinion, would reach this conclusion whether hot hitters in fact existed or whether they did not.

Stated another way, the hot-hand opponents are arguing—or seem to me to be arguing—that the absence of proof *is* proof. The absence of clear proof that hot hands exist is proof that they don't. I am arguing that it is not. The argument against hot streaks is based on the *assumption* that this analysis would detect hot streaks if they existed, rather than on the proven fact. Whether hot streaks exist or do not I do not know—but I think the assumption is false.

On (9) (batting ahead of a good hitter does not ordinarily cause anyone to hit better), I still believe this to be true. While this analysis relies on part on comparison offshoots, it does so in a more tangential way. I believe that a more careful study, steering clear of comparison offshoots, is still likely to demonstrate that hitters perform (essentially) independent of one another, except in a few isolated cases.

In a sense, it is like this: a sentry is looking through a fog, trying to see if there is an invading army out there, somewhere through the fog. He looks for a long time, and he can't see any invaders, so he goes and gets a really, really bright light to shine into the fog. Still doesn't see anything.

The sentry returns and reports that there is just no army out there—but the problem is, he has underestimated the density of the fog. It *seems*, intuitively, that if you shine a bright enough light into the fog, if there was an army out there you'd have to be able to see it—but in fact you can't. That's where we are: we're trying to see if there's an army out there, and we have confident reports that the coast is clear—but we may have underestimated the density of the fog. The randomness of the data is the fog. What I am saying in this article is that the fog *may be* many times more dense than we have been allowing for. Let's look again; let's give the fog a little more credit. Let's not be too sure that we haven't been missing something important.

Protest Upheld, Computer Software Confounded

I t is well known that a manager may formally protest a game only if he claims an umpire has made a decision contrary to the rules. Dissatisfaction with a specific call (safe/out, ball/strike, fair/foul) is not grounds for a protest.

However, sometimes things get a little murky. Take, for example, the game of July 20, 1947, played by the Cardinals against the Dodgers in Ebbets Field. A protest by the Cardinals that day was upheld, although the specific rule that was violated is hard to pin down. Also, the remedy decreed by National League President Ford Frick went beyond the protest rules. Finally, as a result of the odd decision by Frick, the software used by Retrosheet was unable to capture accurately the events of the play.

Let's address these three points separately, beginning with a short summary of what happened on the field that day. Jim Hearn pitched a great game for St. Louis, allowing no runs, two walks and only four singles through eight innings. In the top of the ninth with two outs and the bases empty, right fielder Ron Northey hit a "towering drive" to the wall in right center off Hugh Casey. Dodger center fielder Pete Reiser leaped but couldn't get it. Roscoe McGowen described it in the *New York Times*: "There was a lapse of a couple of seconds before the ball dropped back on the field, where Walker [right fielder Dixie] picked it up and fired it to Stanky [second baseman Eddie], who relayed it to [catcher] Bruce Edwards." The sliding Northey was tagged out on a close play, pictured on page 20 of the July 21, 1947, edition of the *New York Times*. *The Sporting News* has a picture of the play at the plate from a different angle on page 9 of its July 30, 1947, issue.

Umpire Larry Goetz, working at first base in the three-man crew, ran into the outfield and immediately called "No," ruling that the ball hit the top of the wall. Beans Reardon was the other base umpire, and as Northey approached third base Reardon signaled that it was a home run. Northey naturally slowed his pace as he continued to the plate, where umpire Jocko Conlan called him out, ending the inning. The Cardinals

DAVE SMITH joined SABR in 1977 and published his first BRJ article on Maury Wills in 1980. He is the founder of Retrosheet, a historical organization which collects and distributes box scores and accounts of major league games (www.retrosheet.org).

immediately and vehemently protested, saying that Northey had been deceived by Reardon. The consensus in the press box and from the umpires (in later testimony) was that the slow-footed Northey would almost certainly have been safe had he not slowed down.

Manager Eddie Dyer formally protested the game and the Dodgers came to bat, still trailing by two runs. The Cardinals used three pitchers to face seven batters, but only obtained one out as Brooklyn collected three hits, a walk, a stolen base (coupled with a throwing error by catcher Joe Garagiola), and used three pinch-hitters to score three times and apparently win the game 3-2.

President Frick's ruling was released on July 25, and he tried to be Solomon-like as he reached an unorthodox decision. The starting point was to accept the widespread view that Northey would have scored except for Reardon's action. Therefore, Frick ruled that Northey was to be credited with a home run. However, he also let the three Dodger runs from the bottom of the ninth stand and the game went in the books as a 3-3 tie with all individual records counting in the official totals. Only Casey's win and Murry Dickson's loss were expunged. A replay of the entire game was scheduled as part of a double-header on August 18, when the Cardinals were next scheduled to be in Brooklyn.

What rule was violated? The rule book does not specifically address confusing or deceptive actions by umpires, so Frick made a commonsense determination that the events on the field were (a) caused by the umpire, and (b) unfair to the Cardinals. The stated procedure in the rule book for an allowed protest is to resume the game at the point of the protest. In this case, that would mean the Cardinals should still be batting with two outs in the top of the ninth and a 3-0 lead. The three Dodger runs in the bottom of the ninth would be wiped out. Frick explained his action: ". . . fairness, common sense and sportsmanship must govern any decision not explicitly covered by the rules."

The software problem is that we have no way to deal with an inning that "ends early," as the ninth did for the Cardinals when they only recorded two outs. It was necessary for us to make up a bogus play for the next batter, Whitey Kurowski, so that we could move on to the bottom of the ninth.

There are two questions that remain unanswered for me.

[1] Where was Reardon standing when the play began? [2] Why did Northey slide? It is interesting to note how umpires choreograph their movements when there are only two men working the bases. Even though Northey was a left-handed batter, it seems likely that with the bases empty, Reardon was on or near the left-field foul line. That would be consistent with the facts that Goetz ran into the outfield to view the play and that Reardon was near third to make an indication to Northey.

The sliding question is more vexing. If Northey believed that Reardon gave him the homer sign, then why would he slide? The story in *The Sporting News* says he "jogged" to the plate. Perhaps he noticed the ball coming in and decided that Reardon was wrong, causing him to speed up and then slide in an attempt to evade the tag.

Final note: The tie game was played off as the second half of a day-night doubleheader on August 18, meaning that the Dodgers charged separate admission for the two games. The attendance at the first game was 32,781 and at the second was 33,723. The Dodgers donated "all receipts of the night game . . . amounting to $46,000, plus a probable $4,000 from the Frank Stevens War Memorial Fund" to the Brooklyn War Memorial Fund, Inc. The Dodgers won both that day, by scores of 7-5 and 12-3.

Identifying Mystery Photos

One day in the late summer of 1947, my mom and I were listening to Harry Caray on the radio describe a very exciting play at the plate during a game between the Cardinals and Dodgers. My mom, who had been clipping sliding action photos from the newspapers for many years, said to me: "That play might make a good shot for the paper tomorrow."

The next morning, my mom woke me to show me a photo of the play Harry had described. The photo showed Marty Marion sliding into home plate with the ball bouncing toward Dodger catcher Bruce Edwards.

Now, more than 50 years later, I still consider it to be a perfect sliding photo, and I am still searching for an original print of that very photo. It appeared in the *Globe Democrat* and was used as an AP wire photo, but I have been unable to find an original of that photo.

Because my mom had been clipping sliding action photos for many years, I was getting an education on baseball photos and how to identify players, teams, and games before I ever attended grade school.

I have spent most of my free time in life in pursuit of all the sliding photos of baseball games from pre-1960 that I can find. This search has resulted in acquiring many photos that over the years have lost their paper captions, which were put on pictures with descriptions of the players in the photographs.

Over the years the effort to identify these photos has led me on some wonderful searches because each photo has its own identity.

For me, the beauty of a photo is in its clarity, the position of the players, and how clear and clean the action is. Stan Musial was far and away the most photogenic slider of all time. Ty Cobb showed more determination, Jackie Robinson was more exciting, but Musial made the picture-perfect slide. Eddie Waitkus and Lou Gehrig also had beautiful sliding techniques,

producing great photographs.

In my collection of over 5,000 photos of sliding action, there are some that have presented greater challenges to identify. I will take you on a few detective searches with me to solve these mysteries.

If you are serious about being a photo detective, it is necessary to have certain research tools. It is essential to be able to recognize as many player faces as possible, and it is a major asset to form a file of all major league umpires. Often times an umpire will help determine when the game was played.

As for the research tools, here is what you need: *Baseball by the Numbers* by Mark Stang, *Baseball Uniforms of the 20th Century* by Mark Okkonen, *Baseball Encyclopedia* by Neft & Cohen, and box scores from *The Sporting News*.

It is also essential that you be willing to spend hours in a library going through newspaper microfiche looking for the actual game story. Following are a few case files on each mystery.

Marty Marion, Cardinal shortstop, starts his slide into home plate with the Cards' first run of their game with Brooklyn on September 13, 1947. Awaiting the ball is catcher Bruce Edwards. Backing up the play is Brooklyn pitcher Vic Lombardi. Umpire Al Barlick prepares to make the call. This photograph—and all of the photos used in this article—appear courtesy of the George Michael Collection.

SABR member **GEORGE MICHAEL** is the host of T*he George Michael Sports Machine*, the longest-running sports show in syndication. The show has won over 30 Emmys in 20 years. George is also the host of the *PBR Bull Riding*, which is broadcast on the NBC television network, and the host and creator of the award winning show *Full Court Press*. In addition, he is both the executive producer and play-by-play announcer of the Washington Redskins pre-season football games.

Case 1: THE PERFECT SLIDE

This is one of the best examples of the beauty of Stan Musial's sliding into home. I acquired this photo in 1998, with no identification on the back, from the widow of a photographer for the *St. Louis Globe-Democrat*. I wanted to know everything there was to know about the photo—the date, the inning, and how the play occurred. Here are the clues I discovered:

I recognize the umpire as Stan Landes by his nose and face.

Obviously Stan Musial

The "B" logo adorns a Brooklyn Dodgers cap

Dirty shoes suggest that it is not early in the game. This conclusion is also supported by the damaged chalk line of the batter's box.
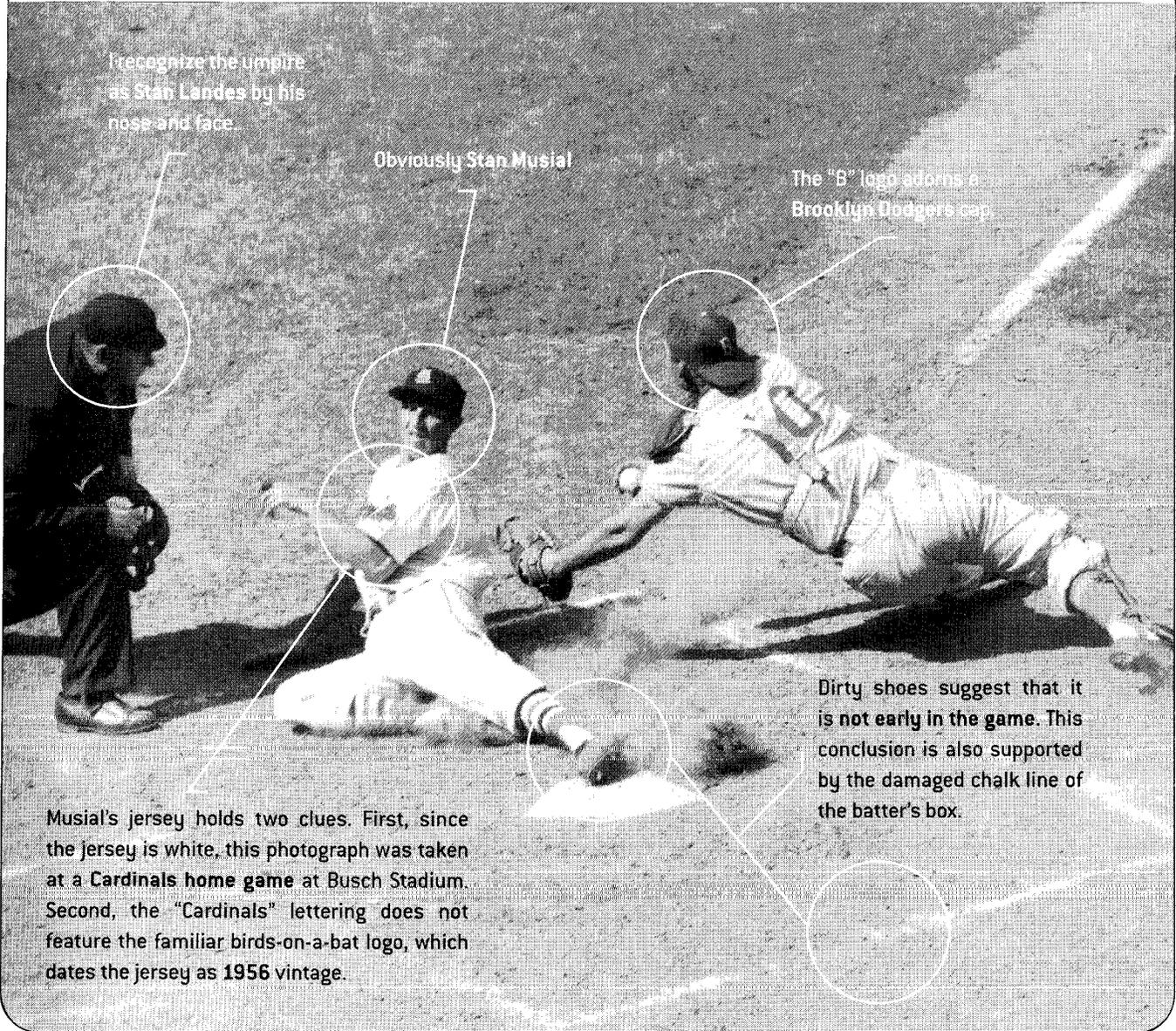
Musial's jersey holds two clues. First, since the jersey is white, this photograph was taken at a **Cardinals home game** at Busch Stadium. Second, the "Cardinals" lettering does not feature the familiar birds-on-a-bat logo, which dates the jersey as **1956** vintage.

WHAT CRACKED THE CASE

Going through the box scores of Cardinal-Dodger games of 1956 in St. Louis with Rube Walker catching and Stan Landes umpiring leads me to one date: July 21, 1956.

IDENTIFICATION

In the *Globe-Democrat*, I found this caption under the photo by Bruce Bacon: "In the sixth inning Stan Musial slides away from the tag of Dodger catcher Rube Walker to score the go-ahead run". Whitey Lockman had grounded to Junior Gilliam, who threw home to Walker. The umpire is Stan Landes. *Case closed*.

Case 2: A LOT OF DUST

When I first saw this photo, I thought I was in for real trouble. How could I ever identify the player—the runner buried in dust—and no number on the catcher? So I started with the available clues:

The socks and cap of the runner are from a Cardinals uniform.

The catcher's socks are distinctive of a 1935 Giants uniform.

I am 90% certain that the umpire is Bill Stewart.

Since the catcher plays for the Giants, his white jersey means the game was played at the Polo Grounds.
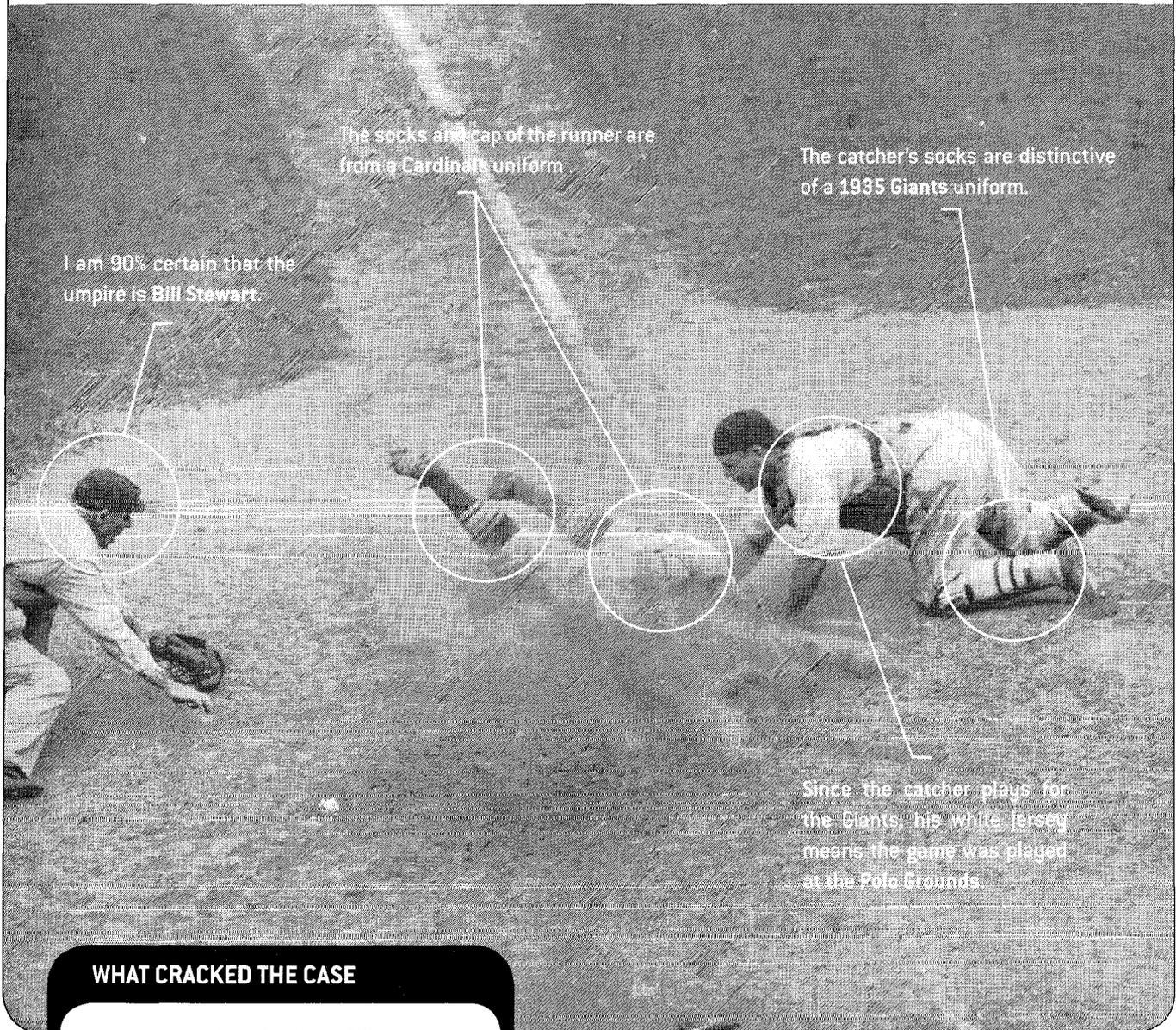
WHAT CRACKED THE CASE

Following my hunch about Bill Stewart, I researched Giants box scores to find that Stewart was indeed the home plate umpire at the Polo Grounds on August 16, 1935.

Pepper Martin oftentimes dove head-first into home. But on August 16, he had only one hit, a home run, which I thought eliminated him from a play at home.

IDENTIFICATION
In the library I found in the *Globe-Democrat* of August 17, 1935, the photo of: "Pepper Martin diving into home on his inside-the-park home run in the seventh inning as the Giants' catcher Gus Mancuso reaches for a late tag, umpire Bill Stewart gives Pepper the good news: 'You are safe.'" *Case closed*.

Case 3: THE PEPPER MYSTERY

This photo of Pepper Martin was one of the toughest photos I have ever had to identify. The back of the photo, which I got in 1989, says: "'Pepper Martin sliding into first base, 1936 season at Sportsman's Park' — J. Roy Stockton, *St. Louis Post-Dispatch."* Well, that's certainly Pepper Martin. But see what else I divined from this photograph:

These are the right field bleachers at Sportsman's Park. This isn't a photo of first base. It is a photo of *THIRD* base.

This uniform holds two clues. The **Pirates** had a big belt and a wide loop on the pants during Pepper Martin's time, but the two-tone socks help date this photo more precisely—between 1933 and 1935.

Pepper Martin

The attendance at the game is in the area of 20,000-23,000. [I sold scorecards at the park in 1953, 1954, and 1955, and I won many pools for crowd estimates.]

In 1936, the Pirates' first baseman was Bill Brubaker, #25, so clearly the description on the back of the photo is wrong. However, Pirates' third baseman Pie Traynor wore #20, and played his last game with the Pirates in 1935.

WHAT CRACKED THE CASE

Checking every Cardinals-Pirates box score from 1933 to 1935 with Martin involved in a play at third base, with a crowd of 20,000-23,000. On June 12, 1933, the Cardinals and Pirates had a crowd of 21,000, the largest crowd of the year. This is the only date that this play could have occurred.

IDENTIFICATION

From the play-by-play account of the games of the doubleheader in the June 12, 1933, *Pittsburgh Post-Gazette*: Eighth inning, first game: "Frankie Frisch singled to right. Martin advanced to third ahead of Paul Waner's throw to Traynor."

It took me two years of research to solve this "Mystery of Pepper," and at long last: *case closed*.

Case 4: THE SCOREBOARD

At first glance, this appears to be a photo of a Dodger intra-squad game. Let's look at the facts:

The umpire is **Frank Dascoli.**

The catcher is **Roy Campanella.**

Beneath the scoreboard is an advertisement for "Cerveza Presidente." Cerveza Presidente is a beer that was popular in the **Dominican Republic**—this is the key.

The runner is clearly safe on the play, so according to the scoreboard, this must be a photo of the first run of a game.

WHAT CRACKED THE CASE

In Roy Campanella's book *Great to Be Alive*, he writes about playing against the Dodgers in the Dominican Republic in the spring of 1948. Campanella was a catcher for the Montreal Royals that year.

Going through all of the box scores of the Royals and the Dodgers, I looked for a game with the first run scoring in the fourth inning, and that also had Frank Dascoli as the home plate umpire. Such a game took place on March 16, 1948.

IDENTIFICATION

From the *New York Daily News*—3/16/48 game account: "The Dodgers Carl Furillo had an inside-the-park home run in the fourth inning, beating the throw home to Montreal catcher Roy Campanella." *Case closed*.

Case 5: THE CHAMBER OF COMMERCE

This is as tough a photo as can be found to identify. At first glance, there is nothing that identifies the players or the teams in this photo. But a close study reveals a few clues:
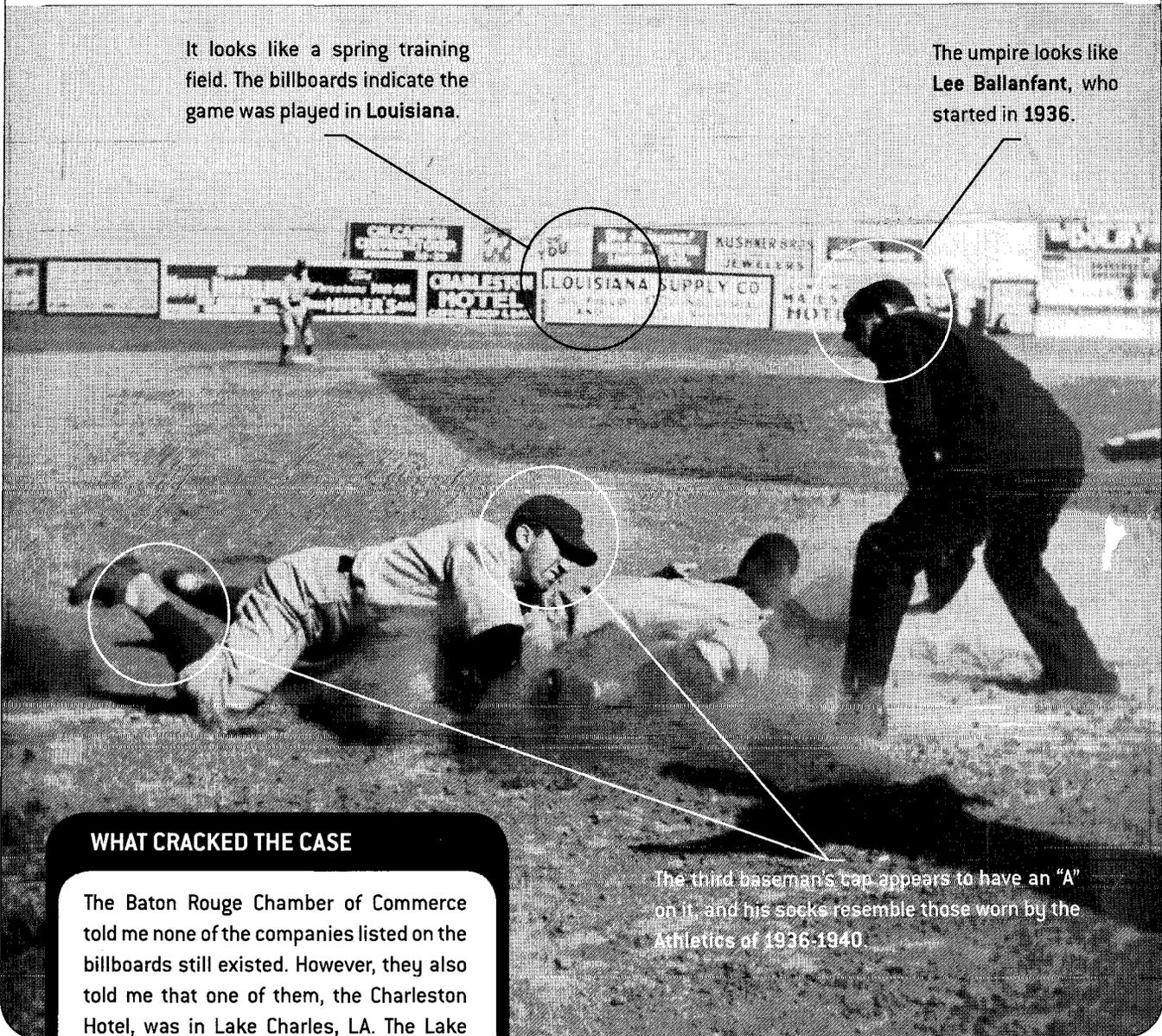
It looks like a spring training field. The billboards indicate the game was played in **Louisiana**.

The umpire looks like **Lee Ballanfant**, who started in **1936**.

The third baseman's cap appears to have an "A" on it, and his socks resemble those worn by the Athletics of 1936-1940.

WHAT CRACKED THE CASE

The Baton Rouge Chamber of Commerce told me none of the companies listed on the billboards still existed. However, they also told me that one of them, the Charleston Hotel, was in Lake Charles, LA. The Lake Charles Chamber of Commerce referred me to McNeese State University, who found that the Giants and the Athletics played at Legion Park in 1939.

Going through the Giants' spring training games of 1939, I found that the Giants beat the Athletics on March 11, 1939.

IDENTIFICATION

At the Library of Congress, the *New York Daily News* of March 12, 1939, contained the photo with the caption: "Giants' Billy Jurgess dashes first-to-third. Athletics' third baseman Bill Nagel tagged Jurges out as umpire Lee Ballanfant made the call."

Thanks to all of the people at the Chamber of Commerce who helped solve this mystery. *Case closed*.

THE BASEBALL RESEARCH JOURNAL

Case 6: THANKS, MARK STANG

The only thing I know for sure when I first got this picture was that it was Terry Moore of the Cardinals, so here is what I had to work with:

A double band appeared on the sleeve of the Cubs' uniforms in 1935 and 1936.

The ballpark is Wrigley Field. The attendance is approximately 25,000.

Terry Moore's white cap is pre-1940. Moore joined the Cardinals in 1935.

History says Stan Hack wore #6. However, Mark Stang's book *Baseball by the Numbers* shows that Hack wore #39 in 1934, 1935, and 1936. Hack position indicates it's probably a force play.

WHAT CRACKED THE CASE

The photo must be from 1935 or 1936. Going through every game of the Cubs hosting the Cardinals with a crowd of 22,000 to 28,000 leads me to a play-by-play of a game that occurred on August 8, 1936.

IDENTIFICATION

From the *St. Louis Globe-Democrat*: "In the sixth inning, Pepper Martin laid down a sacrifice bunt which Cubs pitcher Bill Lee fielded and threw to Stan Hack for a force out on Terry Moore at third base." The Cardinals beat the Cubs 3-2 in 14 innings before a crowd of 25,000. *Case closed.*

Case 7: THE COBB MYSTERY

I got this photo back in 1994, and the caption on the back reads: "Elberfeld tagging Ty Cobb on a close play at third." There is also a stamp on the back that says "June 1909." The only thing I know for sure is that it was taken at a game with the Tigers pre-July 1, 1909.

Using two other photos, I confirmed that the third baseman is in fact **Kid Elberfeld**.

This player is definitely **not Ty Cobb**. Tigers experts all struggled to identify the runner until April 2004.

The Yankees' striped socks are from **1908-1909**.

The field is the Yankees' **Highland Park**.
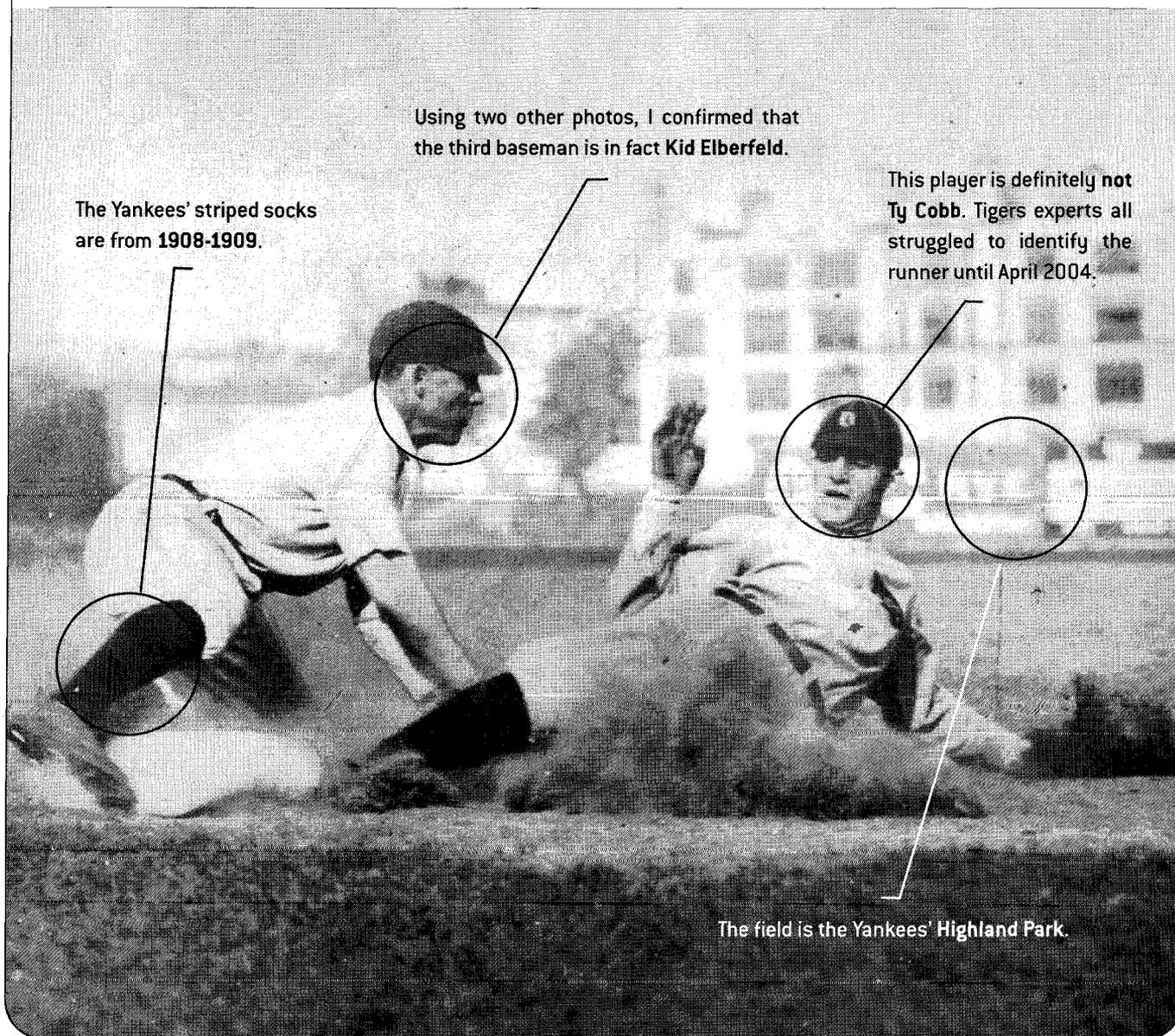
WHAT CRACKED THE CASE

Ray Billbrough, longtime SABR member and Tigers fan, gave me the definitive answer: the runner is George Moriarty. Billbrough had the same photo.

IDENTIFICATION

The *New York Times* story of the June 8 game: "In the second inning, George Moriarty bunted his way on, stole second, and advanced to third on Red Kleinow's overthrow to second, then beating the outfield throw to Elberfeld at third."

This photo is a great example of using the knowledge of SABR members. Thanks to 79-year-old Ray Billbrough of Saline, Michigan, a great Tigers fan and researcher, *case closed*.

Case 8: IT NEVER HAPPENED

This is one of the most frustrating photos I have ever researched. The caption on the back says: "Mickey Cochrane of the Athletics out at home in the first inning of today's World Series game in Philadelphia." There is a file date on the photo: "Central Library, December 13, 1929." So I am sure that it's from 1929—but let's see why this photo was so tough:

This play is obviously a steal of home, and the runner is clearly safe. However, **there was no steal of home by the Athletics in the Series in Philadelphia.**

Clearly it is the Cubs and the Athletics in the World Series in Philadelphia, but I know Mickey Cochrane when I see him. This is *not* Mickey Cochrane. More importantly, **Cochrane was never on base in the first inning of any of the games in Philadelphia.**
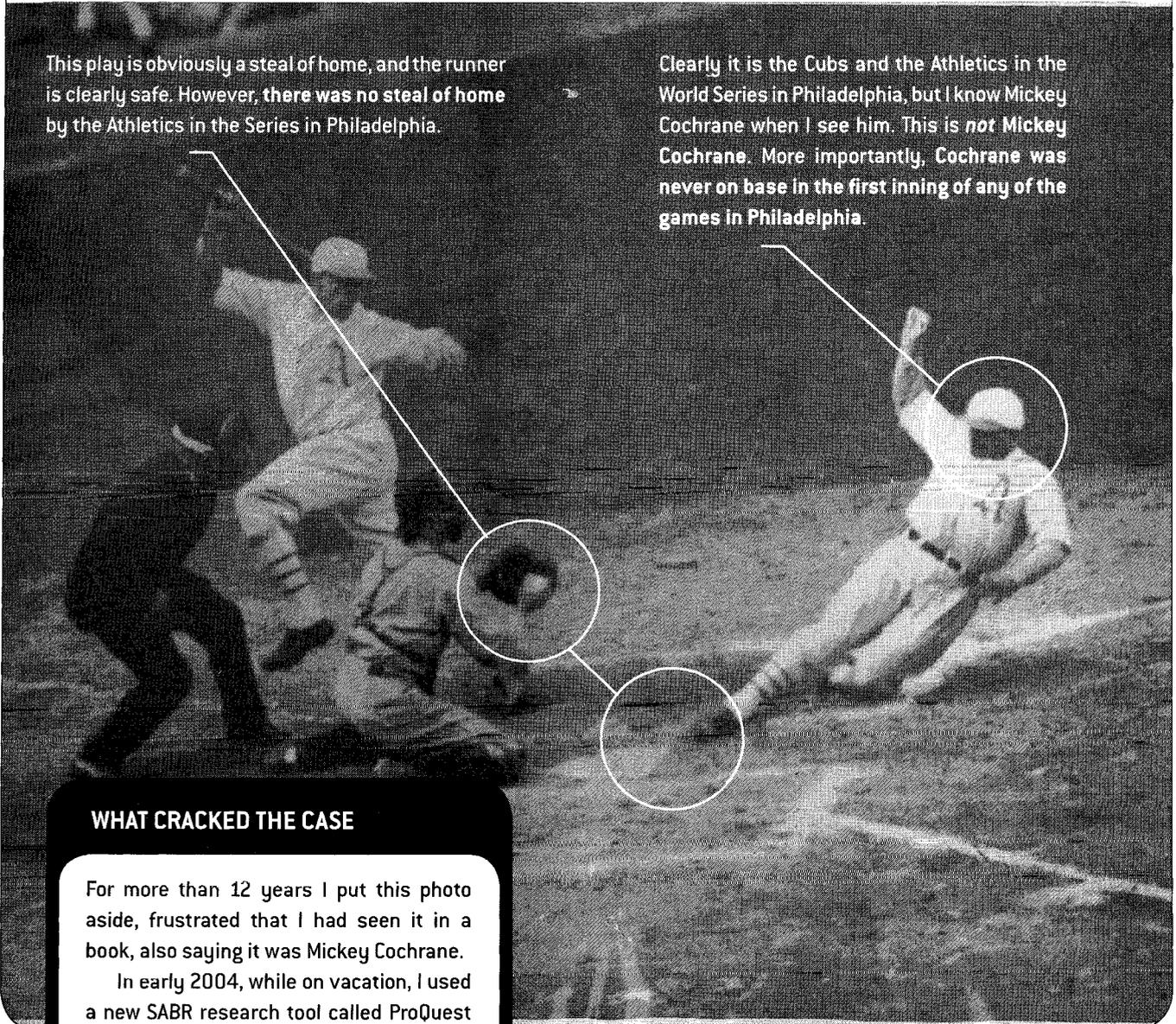
WHAT CRACKED THE CASE

For more than 12 years I put this photo aside, frustrated that I had seen it in a book, also saying it was Mickey Cochrane.

In early 2004, while on vacation, I used a new SABR research tool called ProQuest and decided to look at the newspapers of October 11 through October 15, 1929, looking for photos that might have been taken early in the game.

The October 13, 1929, *Los Angeles Times* solved the mystery. It wasn't the same photo, but one taken from another angle.

IDENTIFICATION

The *Times* caption read: "Jimmy Dykes would have stolen home in the second inning, but pitcher George Earnshaw was called out on strikes to end the inning." This is the correct information.

So our misidentified mystery photo was a photo of a play that never happened. Even so, it remains my favorite photo from the 1929 World Series. *Case closed.*

Case 9: THE HAND

This is the kind of photo that offers a ton of clues, even though I don't recognize the faces of any of the players.

The catcher's socks tell me he's from the 1939 Giants.

The umpire holding his left hand is a major clue. Two umpires that held their hand this way were Jocko Conlon and Babe Pinelli. It is not Jocko Conlon, so I proceed with the knowledge that it is Babe Pinelli.

In 1939, Dolph Camilli wore #4 for the Dodgers.

Obviously the Dodgers, and the patch on the left sleeve also tells me it's 1939.

The chalk marks of the batter's box. It is so clean that it has to be a run scored in the first or second inning.

WHAT CRACKED THE CASE

Although I do not recognize any of the players, I solve the mystery by studying box scores from *The Sporting News* of 1939.

IDENTIFICATION

I discovered that on April 21, 1939, the Dodgers' Goody Rosen scored in the first inning on Babe Phelps' fly ball to Mel Ott, beating the throw home to Giants catcher Harry Danning. Phelps was the batter before Camilli, so I know this is when the play occurred. Babe Pinelli was the home plate umpire on April 21, which confirms the date of the photograph. *Case closed*.

Case 10: UNSOLVED CASE MYSTERY

While there are always photos that require a great deal of research, some need special help, where research does not provide the answer. Do you have the skill to solve this mystery? I do not know who the runner is in this photograph from a Yankees game in the first week of the 1932 season (the file stamp is dated April 16, 1932). Here are the clues:

The shortstop is probably Lyn Lary.

The umpire is unknown.

The runner is from either the Athletics or the Red Sox—most likely the A's.

A relatively undisturbed infield suggests it is the first or second inning.

The Yankee in the foreground is Jack Saltzgaver, who played only 16 games in 1932, but played in the games of the first week against the Red Sox and Athletics.
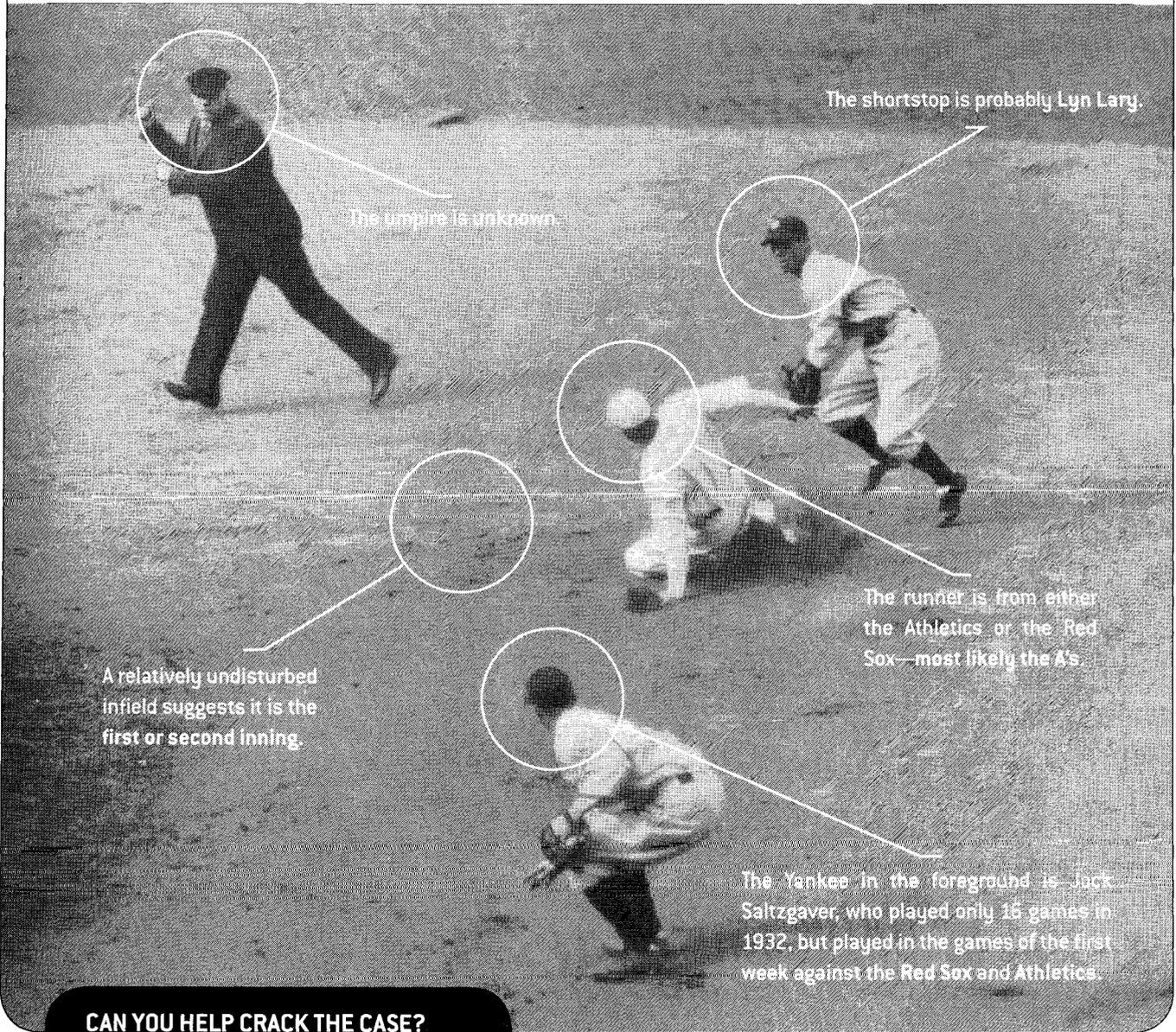
CAN YOU HELP CRACK THE CASE?

Who is the home team? Who is the runner? I can be reached at:

George Michael
1201 Sugarloaf Mountain Road
Comus, MD 20842

IDENTIFICATION

One rule on identifying photos: no guessing! I have to be able to guarantee the accuracy of the research. If you have photos of sliding action, let me hear from you! If you have a pre-1960 mystery, let's try to solve it!

Baseball's Most Dominant Strikeout Pitchers

Ever since Boston's Pedro Martinez fired a one-hit, no-walks, 17-strikeout gem against then-defending World Series champion New York in Yankee Stadium in September 1999, a friend of mine has repeatedly said that he'd never seen, in the 30+ years he's been watching the game, any pitcher be as consistently dominant as Martinez. That made me wonder about which pitchers really were the most dominant and how to measure that dominance. The strikeout, symbolic of a batter's complete futility against the pitcher, is one obvious measuring stick. Not the sheer number of strikeouts, but the frequency with which batters succumb to the dominant pitcher's power.

Baseball fans have been bombarded by a barrage of new statistics over the last couple of decades and, as a result, are sophisticated enough to know that raw numbers, like the total number of strikeouts a pitcher racks up, are not necessarily indicative of the quality to be measured. For example, although Houston's Roy Oswalt whiffed 206 batters last season, the Cubs' Matt Clement (only 190 strikeouts) struck them out at a better clip, 9.45 per nine innings, compared to Oswalt's 7.82 per nine innings. But that simple correction to the raw number is really not sufficient to determine who was more dominant. And that's the point of this article—there are additional factors (two of them) that must be taken into account if we truly want to determine which pitchers were baseball's most dominant strikeout aces.

First, in order to compare pitchers across baseball's different eras, the strikeout rate must be compared to the league average. Was NL Cy Young Award winner Randy Johnson's 2001 season, in which he set an all-time major league record with a rate of 13.41 Ks per nine innings, really the most dominant strikeout season in baseball history? NL batters as a whole struck out 6.99 times per nine innings in 2001, so Johnson had almost twice the rate the league had. But another Johnson, Hall-of-Famer Walter Johnson of the Washington Senators, was just as dominant back in 1924. Although "The Big Train" fanned batters at a league-leading clip of only 5.12 per nine innings,

the league strikeout rate was a miniscule 2.68 per nine innings. The bottom line is that Johnson and Johnson had virtually the same strikeout rates when compared to their league averages!

[The 1981 issue of the *Baseball Research Journal* featured an article by James P. Maywar in which he, too, compared pitchers' strikeout per game rates with those of the league, but he took the *difference* between the two values rather than the *ratio* of the two; this is flawed because it favors pitchers in high strikeout eras. For example, if a pitcher averaged 12 Ks per game when the league average was six per game, then he would be six per game better than the league. If another pitcher averaged six per game when the league average was two per game, then he'd only be four per game better than the league. According to Maywar, the former would be the more impressive strikeout pitcher because his difference of six per game is larger than the latter's difference of four per game. But the latter pitcher is three *times* better than average, while the former is only two times better than average.]

The second correction that's required is to calculate the strikeout rate per batter-faced-pitcher (BFP), not per nine innings (or 27 outs). Consider two pitchers who pitch the following two innings: pitcher A fans the first hitter he faces, gets the second batter to ground out, and whiffs the third man; pitcher B strikes out the leadoff hitter, gives up a double to the second batter, whiffs the third, walks the fourth, and fans the fifth. Three strikeouts in one inning for pitcher B, only two for pitcher A; so pitcher B has chalked up a rate of 27 strikeouts per 9 innings, while pitcher A only fans 18 per nine innings. But pitcher A struck out two of the three batters he faced (67%), while pitcher B only struck out three out of five (60%). Pitcher A in this example is actually the more dominant strikeout pitcher.

How about some real-life examples? In a game in June 2004, Colorado's Jason Jennings struck out eight Yankees in 5⅓ innings; a month later, San Diego's David Wells struck out seven Royals in six innings. If we measured strikeout dominance strictly by Ks per inning, then Jennings would surpass Wells, 13.5 per 9 innings compared to 10.5 per 9 innings. But Jennings gave up 10 hits and 3 walks in that game, facing a total of 30 batters; Wells, meanwhile, pitched a nice four-hit, one-walk, six-inning effort in facing 21 batters. So Wells' seven

JEAN-PIERRE CAILLAULT is a professor of astronomy at the University of Georgia. He has published articles in *Baseball Digest* and the *Baseball Research Journal* and is the author of *A Tale of Four Cities* and the forthcoming *New York Clipper Biographies: The Complete Collection*.

strikeouts against 21 batters (.333) was better than Jennings's eight strikeouts against 30 hitters (.267).

We can see this effect clearly when looking at pitchers' entire seasons, too. Take Minnesota's Kyle Lohse's stats from last season (111 Ks, 194 IP, and 883 BFP) and compare them with those of the Indians' Jake Westbrook (116 Ks, 215⅔ IP, and 895 BFP). Lohse struck out 5.15 per nine innings, while Westbrook only whiffed batters at a rate of 4.84 per nine innings. But Westbrook struck out .130 of the batters he faced (116/895), while Lohse struck out his opponents at a rate of just .126 (111/883).

So which pitchers had the most dominant strikeout seasons in major league history? Where do multiple Cy Young Award winners Randy Johnson's and Pedro Martinez's recent great seasons rank on the all-time list? Table 1 lists all the seasons (60 of them) in which the ratio of a starting pitcher's strikeout/BFP rate was at least double that of the league strikeout/BFP rate (in order to qualify, the pitchers had to have pitched at least one inning per team game and started at least 20 games).

The most dominant strikeout pitcher of all time was clearly Dazzy Vance of the 1920s Brooklyn Dodgers. His six seasons from 1923 through 1928 all rank in the top 14 all-time, including the best season ever (1924, when he was 2.99 times better than the league rate), three of the top four, and four of the top six! Vance had two other seasons on the top 60 list, too, for a total of eight. The second most dominant strikeout pitcher in baseball history was the Deadball Era's Rube Waddell, who achieved the second highest single-season ratio ever (2.93, while pitching for Connie Mack's Philadelphia Athletics in 1902) and two other seasons in the top dozen (another one with Philly in 1903 and one with the Pirates in 1900). Other great pitchers who appear frequently at the top of the list are the Athletics' Lefty Grove, who has three of the top 20 years (his 1926-28 seasons), and, predictably, all-time strikeout king Nolan Ryan, with two of the top 20 (both with California) and a total of eight times when he more than doubled the league rate.

The only active pitchers who appear on the list are, not too surprisingly, the Diamondbacks' Johnson (five times) and the Red Sox's Martinez (twice). In fact, the Boston ace's fabulous 1999 season ranks as the 9th most dominant of all time, when he struck out batters at a rate 2.39 times better than the rest of the league. Martinez's 2000 season also ranks in the top 20, as does Johnson's 1995 season with Seattle. The outstanding season that Johnson had in 2001 (ratio of 2.07) also appears on the list, but only ranks in a tie for 38th place. (Walter Johnson's 1924 season, by the way, is a just a notch behind, at 2.06.)

Compiling such a list generated many surprises, in terms of both those who appear on it and those who failed to make the cut. For example, Cy Seymour, perhaps best known for his spectacular hitting in 1905 when he won the NL batting championship while with Cincinnati, was a 19th-century strikeout king while pitching for the New York Giants (three times on the list, including the seventh most dominant strikeout season ever). The Reds' Johnny Vander Meer, who forever locked up a place in baseball history when he hurled two consecutive no-hitters during the 1938 season, racked up the 11th most dominant strikeout season in 1941 and tied for 48th place with his 1942 season.

The most glaring absence is that of former single-season strikeout record holder Sandy Koufax. The Dodgers' fireballing left hander chalked up lots of Ks, but did so during the 1960s, when the strikeout rates rose dramatically, reaching record values that weren't equaled again until the free-swinging 1990s. Other prominent strikeout artists whose names are missing from the list are Roger Clemens, Tom Seaver, Steve Carlton, and Sam McDowell. The reason for their absences is the same as that for Koufax: although they were outstanding strikeout pitchers, their high totals were achieved at times when strikeouts were easier to obtain than during the times when the pitchers who did make the list were pitching.

My friend whose comments about Pedro Martinez first got me interested in this project is a big Yankees fan and frequently reminisces about how awesome Goose Gossage was when he pitched for the Pinstripes back in the early 1980s. Those recollections of his made me curious about who really were the most dominant *relief* strikeout pitchers of all time. Table 2 lists all the seasons (59 of them) in which a relief pitcher's strikeout/BFP rate was at least double that of the league strikeout/BFP rate (in order to qualify, the relief pitchers had to have pitched at least 50 innings in a season; the lone exception is Gossage's 46.2 IP in the strike-shortened 1981 season).

The most dominant strikeout season ever by a reliever was that achieved by the Dodgers' Eric Gagne in 2003. Not only did Gagne's well-publicized 14.98 strikeouts per 9 innings break Billy Wagner's record of 14.95 (set in 1999 with Houston), but Gagne also broke Wagner's relievers' record for best ratio of K/BFP vs. League K/BFP, 2.62 compared to 2.55. Although Gagne made the relievers' list in 2002 and again in 2004 and Wagner also has two other seasons on the list (1997 and 1998), Rob Dibble's four-year run from 1989 to 1992 with Cincinnati probably qualifies him as the most dominant strikeout pitcher among relievers. During that stretch Dibble attained the 3rd best season (ratio of 2.50), the 7th best (2.39), tied for the 8th best (2.33), and tied for the 14th best (2.29).

Gossage is the only other reliever besides Dibble to make the list four times (once with the Pirates and three times with

the Yankees). But his peak ratio of 2.29 in 1981 gets him only as high as 14th place on the relievers' list. In fact, his fellow Yankee bullpen ace that season, Ron Davis, struck batters out at a 2.40 clip compared to the league, the sixth most dominant season by a reliever in baseball history. Although current New York bullpen ace Mariano Rivera hasn't yet had such a spectacular strikeout season, the Yankees franchise has a couple of other entries on the reliever list: Joe Page's 1947 season (a ratio of 2.07) and Ryne Duren's 1958 and 1959 seasons (2.19 and 2.31, the latter being the 12th best of all time).

A quick glance at the years on the two lists confirms what we already knew about the trend during the last few decades: the constantly increasing use of relief pitchers. Only five of the 59 seasons on the relievers' list occurred prior to 1970, whereas the 60 seasons listed for starting pitchers are much more evenly spread out over the entire course of major league history. The other relief pitchers, besides Gagne, to make the list from the 2004 season were Brad Lidge (2.46, fourth best of all-time), Francisco Rodriguez (2.23), B.J. Ryan (2.06), and Octavio Dotel (2.04).

The final list (Table 3) is that of the pitchers who were caught in between the two categories—the spot starters. The 19 pitchers on this list pitched less than an inning per team game, but more than 50 innings and with at least 20% of their appearances in a starting pitcher's role. At the top of the list is "Rapid Robert," the Indians' Bob Feller, who, as a 17- and 18-year old, set the AL aflame with incredible strikeout ratios of 3.33 and 2.53. The familiar names of Dazzy Vance, Rube Waddell, Randy Johnson, and Pedro Martinez appear on this list, too. And, as usually happens when compiling statistics of this sort, completely unexpected results pop up: as hard as it is to believe, the totally obscure Washington Senators' Joe Krakauskas had a season (1938) that was as dominant in strikeouts (ratio of 2.13) as the best Sandy Koufax could ever achieve (in 1957, when the Dodgers were still in Brooklyn).

The only pairs of teammates that appear on the three lists are: Lefty Grove and George Earnshaw of the 1928 Philadelphia Athletics (both starters), Dizzy Dean and Dazzy Vance of the 1933 St. Louis Cardinals (Dean was a 23-year-old starter, Vance a 42-year-old spot starter), the aforementioned relief duo of Gossage and Davis of the 1981 New York Yankees, and Randy Johnson (starter) and Byung-Hyun Kim (reliever) of the 2000 Arizona Diamondbacks.

As for the future, it wouldn't be too surprising to see Eric Gagne's relievers' record broken (Houston's Lidge came close last year), but a starting pitcher in these days of wildly high strikeout totals would have to punch out about 18 batters per game in order to match Dazzy Vance's amazing 1924 season!

Table 1. Starting Pitchers

Rank	Pitcher	Team	Year	G/GS	IP	BFP	K	K/9	K/BFP	LK/BFP	Ratio
1	D.Vance	BKN-N	1924	35/34	308.1	1221	262	7.65	.215	.072	2.99
2	R.Waddell	PHI-A	1902	33/27	276.1	1099	210	6.84	.191	.065	2.93
3	D.Vance	BKN-N	1925	31/31	265.1	1089	221	7.50	.203	.071	2.86
4	D.Vance	BKN-N	1926	24/22	169.0	713	140	7.46	.196	.071	2.76
5	L.Grove	PHI-A	1926	45/33	258.0	1072	194	6.77	.181	.072	2.51
6	D.Vance	BKN-N	1928	38/32	280.1	1126	200	6.42	.178	.071	2.50
7	C.Seymour	NYG-N	1898	45/43	356.2	1598	239	6.03	.150	.061	2.45*
8	R.Waddell	PIT-N	1900	29/22	208.2	865	130	5.61	.150	.062	2.42
9	P.Martinez	BOS-A	1999	31/29	213.1	835	313	13.20	.375	.157	2.39
10	D.Vance	BKN-N	1923	37/35	280.1	1187	197	6.32	.166	.071	2.35
11	J.Vander Meer	CIN-N	1941	33/32	226.1	945	202	8.03	.214	.093	2.30
12	R.Waddell	PHI-A	1903	39/38	324.0	1307	302	8.39	.231	.103	2.25
13	L.Grove	PHI-A	1927	51/28	262.1	1106	174	5.97	.157	.071	2.23
14	D.Vance	BKN-N	1927	34/32	273.1	1123	184	6.06	.164	.074	2.22
15	H.Score	CLE-A	1955	33/32	227.1	978	245	9.70	.251	.113	2.21
	N.Ryan	CAL-A	1976	39/39	284.1	1196	327	10.35	.273	.124	2.21
	R.Johnson	SEA-A	1995	30/30	214.1	866	294	12.35	.339	.154	2.21
18	B.Feller	CLE-A	1939	39/35	296.2	1243	246	7.46	.198	.090	2.20
	P.Martinez	BOS-A	2000	29/29	217.0	817	284	11.78	.348	.158	2.20
20	L.Grove	PHI-A	1928	39/31	261.2	1075	183	6.29	.170	.078	2.19
	N.Ryan	CAL-A	1978	31/31	234.2	1008	260	9.97	.258	.118	2.19
22	D.Dean	STL-N	1933	48/34	293.0	1202	199	6.11	.166	.076	2.18
23	B.Feller	CLE-A	1938	39/36	277.2	1248	240	7.78	.192	.089	2.17
24	B.Hallahan	STL-N	1930	35/32	237.1	1045	177	6.71	.169	.079	2.14
	N.Ryan	CAL-A	1973	41/39	326.0	1355	383	10.57	.283	.132	2.14
	N.Ryan	TEX-A	1989	32/32	239.1	988	301	11.32	.305	.143	2.14
27	H.Score	CLE-A	1956	35/33	249.1	1022	263	9.49	.257	.121	2.13
28	D.Gooden	NYM-N	1984	31/31	218.0	879	276	11.39	.314	.148	2.12
29	C.Seymour	NYG-N	1899	32/32	268.1	1220	142	4.76	.116	.055	2.11*
	H.Newhouser	DET-A	1946	37/34	292.2	1176	275	8.46	.234	.111	2.11
31	R.Ruffing	NYY-A	1932	35/29	259.0	1098	190	6.60	.173	.083	2.09
	R.Johnson	SEA-A	1997	30/29	213.0	850	291	12.30	.342	.164	2.09
33	N.Hahn	CIN-N	1899	38/34	309.0	1258	145	4.22	.115	.055	2.08*
	R.Marquard	NYG-N	1911	45/33	277.2	1133	237	7.68	.209	.100	2.08
	P.Malone	CHI-N	1928	42/25	250.2	1048	155	5.57	.148	.071	2.08
	V.Mungo	BKN-N	1936	45/37	311.2	1313	238	6.87	.181	.087	2.08
	B.Feller	CLE-A	1946	48/42	371.1	1512	348	8.43	.230	.111	2.08
38	G.Earnshaw	PHI-A	1928	26/22	158.1	728	117	6.65	.161	.078	2.07
	L.Grove	PHI-A	1930	50/32	291.0	1191	209	6.46	.175	.085	2.07
	N.Ryan	CAL-A	1977	37/37	299.0	1272	341	10.26	.268	.129	2.07
	R.Johnson	ARI-N	2001	35/34	249.2	994	372	13.41	.374	.180	2.07
42	W.Johnson	WAS-A	1924	38/38	277.2	1148	158	5.12	.138	.067	2.06
	D.Vance	BKN-N	1930	35/31	258.2	1061	173	6.02	.163	.079	2.06
44	R.Waddell	PHI-A	1904	46/46	383.0	1548	349	8.20	.2250	.110	2.05
	N.Ryan	CAL-A	1974	42/41	332.2	1392	367	9.93	.264	.129	2.05
46	R.Waddell	PHI-A	1907	44/33	284.2	1162	232	7.33	.200	.098	2.04
	F.Tanana	CAL-A	1975	34/33	257.1	1029	269	9.41	.261	.128	2.04
48	A.Rusie	NYG-N	1895	49/47	393.1	1702	201	4.60	.118	.058	2.03#
	B.Feller	CLE-A	1940	43/37	320.1	1304	261	7.33	.200	.099	2.03
	J.Vander Meer	CIN-N	1942	33/33	244.0	1017	186	6.86	.183	.090	2.03
	N.Ryan	CAL-A	1979	34/34	222.2	937	223	9.01	.238	.117	2.03
	R.Johnson	ARI-N	2000	35/35	248.2	1001	347	12.56	.347	.171	2.03
53	O.Overall	CHI-N	1908	37/27	225.0	908	167	6.68	.184	.091	2.02*
54	C.Seymour	NYG-N	1897	38/33	277.2	1250	149	4.83	.119	.059	2.01*
	P.Malone	CHI-N	1929	40/30	267.0	1152	166	5.60	.144	.072	2.01
	N.Ryan	TEX-A	1991	27/27	173.0	683	203	10.56	.297	.148	2.01
57	T.Ramsey	LOU-AA	1887	65/64	561.0	2430	355	5.70	.146	.073	2.00
	D.Vance	BKN-N	1931	30/29	218.2	918	150	6.17	.163	.082	2.00
	J.Allen	NYY-A	1935	23/23	167.0	692	113	6.09	.163	.082	2.00
	R.Johnson	SEA-A	1993	35/34	255.1	1043	308	10.86	.295	.148	2.00

G/GS	Games/Starts
BFP	Batters Faced
K/9	Strikeouts per Nine Innings
K/BFP	Pitcher Strikeouts per BFP
LK/BFP	League Strikeouts per BFP
Ratio	K/BFP divided by LK/BFP

* Pitcher's BFP estimated by BFP = (3 x IP) + H + BB + HBP - GIDP, where GIDP is estimated from GIDP = IP x (league GIDP/league IP).

Rusie's BFP was estimated in the same way as for those pitchers with asterisks, except that his HBP totals were estimated, too. In 1896 and 1897, Rusie pitched a total of 622.3 innings and had 20 HBP. Therefore, it is estimated that he had 13 HBP in 1895 (when he pitched 393.1 innings).

Table 2. Relief Pitchers

	G/GS	Games/Starts
	BFP	Batters Faced
	K/9	Strikeouts per Nine Innings
	K/BFP	Pitcher Strikeouts per BFP
	LK/BFP	League Strikeouts per BFP
	Ratio	K/BFP divided by LK/BFP

* Dotel's total Ratio is a weighted average of 1.98 in the NL (146 BFP) and 2.09 in the AL (210BFP).

Rank	Pitcher	Team	Year	G/GS	IP	BFP	K	K/9	K/BFP	LK/BFP	Ratio
1	E.Gagne	LAD-N	2003	77/0	82.1	306	137	14.98	.448	.171	2.62
2	B.Wagner	HOU-N	1999	66/0	74.2	286	124	14.95	.434	.170	2.55
3	R.Dibble	CIN-N	1992	63/0	70.1	286	110	14.08	.385	.154	2.50
4	B.Lidge	HOU-N	2004	80/0	94.2	369	157	14.93	.425	.173	2.46
5	A.Benitez	NYM-N	1999	77/0	78.0	312	128	14.77	.410	.170	2.41
6	R.Davis	NYY-A	1981	43/0	73.0	285	83	10.23	.291	.121	2.40
7	R.Dibble	CIN-N	1991	67/0	82.1	334	124	13.56	.371	.156	2.39
8	B.Caudill	SEA-A	1982	70/0	95.2	380	111	10.44	.292	.125	2.33
	R.Dibble	CIN-N	1990	68/0	98.0	384	136	12.49	.354	.151	2.33
	D.Ward	TOR-A	1993	71/0	71.2	282	97	12.18	.344	.148	2.33
11	L.Smith	BOS-A	1989	64/0	70.2	290	96	12.23	.331	.143	2.32
12	R.Duren	NYY-A	1959	41/0	76.2	322	96	11.27	.298	.129	2.31
13	J.Hiller	DET-A	1975	36/0	70.2	295	87	11.08	.295	.128	2.30
14	G.Gossage	NYY-A	1981	32/0	46.2	173	48	9.26	.277	.121	2.29
	T.Henke	TOR-A	1987	72/0	94.0	363	128	12.26	.353	.154	2.29
	R.Dibble	CIN-N	1989	74/0	99.0	401	141	12.82	.352	.154	2.29
17	G.Gossage	NYY-A	1982	56/0	93.0	356	102	9.87	.287	.125	2.28
	T.Henke	TOR-A	1989	64/0	89.0	356	116	11.73	.326	.143	2.28
19	B.Sutter	CHI-N	1977	62/0	107.1	411	129	10.82	.314	.140	2.25
20	B.Wagner	HOU-N	1998	58/0	60.0	247	97	14.55	.393	.175	2.24
21	B.Harvey	CAL-A	1989	51/0	55.0	245	78	12.76	.318	.143	2.23
	F.Rodriguez	ANA-A	2004	69/0	84.0	335	123	13.18	.367	.164	2.23
23	S.Lockwood	NYM-N	1976	56/0	94.1	375	108	10.30	.288	.130	2.22
24	B.Harvey	CAL-A	1991	67/0	78.2	309	101	11.55	.327	.148	2.21
25	R.Duren	NYY-A	1958	44/1	75.2	307	87	10.35	.283	.129	2.19
	T.Percival	CAL-A	1996	62/0	74.0	291	100	12.16	.344	.157	2.19
27	D.LaRoche	CLE-A	1976	61/0	96.1	389	104	9.72	.267	.124	2.16
	M.Littell	STL-N	1978	72/2	106.1	447	130	11.00	.291	.135	2.16
	G.Gossage	NYY A	1980	64/0	99.0	401	103	9.36	.257	.119	2.16
	T.Percival	CAL A	1995	62/0	74.0	284	94	11.43	.331	.154	2.16
	B.Wagner	HOU-N	1997	62/0	66.1	277	106	14.38	.383	.177	2.16
	R.Soriano	SEA-A	2003	40/0	53.0	201	68	11.55	.338	.157	2.16
33	D.Eckersley	OAK-A	1992	69/0	80.0	309	93	10.46	.301	.140	2.15
34	J.Wetteland	MON-N	1993	70/0	85.1	344	113	11.92	.328	.154	2.14
35	G.Braxton	WAS-A	1927	58/2	155.1	639	96	5.56	.150	.071	2.13
36	T.Henke	TOR-A	1986	63/0	91.1	370	118	11.63	.319	.150	2.12
37	A.Benitez	BAL-A	1997	71/0	73.1	307	106	13.01	.345	.164	2.11
38	B.Ayala	SEA-A	1994	46/0	56.2	236	76	12.07	.322	.154	2.10
	R.Nen	SFG-N	2000	68/0	66.0	256	92	12.55	.359	.171	2.10
40	V.Cruz	CLE-A	1980	55/0	86.0	355	88	9.21	.248	.119	2.09
	B.Harvey	CAL-A	1990	54/0	64.1	267	82	11.47	.307	.147	2.09
42	D.Ward	TOR-A	1991	81/0	107.1	428	132	11.07	.308	.148	2.08
	E.Gagne	LAD-N	2002	77/0	82.1	314	114	12.46	.363	.174	2.08
44	D.Radatz	BOS-A	1962	62/0	124.2	506	144	10.40	.285	.137	2.07
	P.Richert	BAL-A	1970	50/0	54.2	216	66	10.87	.306	.148	2.07
	G.Gossage	PIT-N	1977	72/0	133.0	523	151	10.22	.289	.140	2.07
47	B.J.Ryan	BAL-A	2004	76/0	87.0	361	122	12.62	.338	.164	2.06
48	J.Page	NYY-A	1947	56/2	141.1	584	116	7.39	.199	.098	2.04
	D.LaRoche	CLE-A	1975	61/0	82.1	359	94	10.28	.262	.128	2.04
	B.Sutter	CHI-N	1979	62/0	101.1	403	110	9.77	.273	.134	2.04
	A.Benitez	NYM-N	2000	76/0	76.0	304	106	12.55	.349	.171	2.04
	J.Valverde	ARI-N	2003	54/0	50.1	204	71	12.70	.348	.171	2.04
	O.Dotel	HOU/OAK	2004	77/0	85.1	356	122	12.87	.343	.168	2.04*
54	W.Twitchell	PHI-N	1976	26/2	61.2	254	67	9.78	.264	.130	2.03
	J.Rocker	ATL-N	1999	74/0	72.1	301	104	12.94	.346	.170	2.03
	B.H. Kim	ARI-N	2000	61/1	70.2	320	111	14.14	.347	.171	2.03
57	E.Gagne	LAD-N	2004	70/0	82.1	326	114	12.46	.350	.173	2.02
58	J.Kern	TEX-A	1979	71/0	143.0	578	136	8.56	.235	.117	2.01
	R.Hernandez	CHI-A	1995	60/0	59.2	272	84	12.67	.309	.154	2.01

Table 3. Spot Starters

Rank	Pitcher	Team	Year	G/GS	IP	BFP	K	K/9	K/BFP	LK/BFP	Ratio
1	B.Feller	CLE-A	1936	14/8	62.0	279	76	11.03	.272	.082	3.33
2	B.Feller	CLE-A	1937	26/19	148.2	651	150	9.08	.230	.091	2.53
3	T.Ramsey	LOU-AA	1885	9/9	79.0	322	83	9.46	.258	.102	2.52
4	R.Waddell	LOU-N	1899	10/9	79.0	324	44	5.01	.136	.055	2.46
5	B.Turley	STL-A	1953	10/7	60.1	259	61	9.10	.236	.103	2.29
6	W.Wyatt	DET-A	1930	21/7	85.2	363	68	7.14	.187	.085	2.21
7	B.Feller	CLE-A	1945	9/9	72.0	300	59	7.38	.197	.090	2.19
8	B.Bailey	BAL-F	1914	19/18	128.2	557	131	9.16	.235	.109	2.17*
9	P.Martinez	BOS-A	2001	18/18	116.2	456	163	12.57	.357	.165	2.16
10	J.Krakauskas	WAS-A	1938	29/10	121.1	551	104	7.71	.189	.089	2.13
	S.Koufax	BKN-N	1957	34/13	104.1	444	122	10.52	.275	.129	2.13
12	R.Johnson	SEA-A	1996	14/8	61.1	256	85	12.47	.332	.157	2.12
13	R.Ames	NYG-N	1904	16/13	115.0	473	93	7.28	.197	.093	2.10*
14	J.May	CIN-N	1926	45/15	167.2	703	103	5.53	.147	.071	2.06
	D.Vance	STL-N	1933	28/11	99.0	427	67	6.09	.157	.076	2.06
16	J.R. Richard	HOU-N	1980	17/17	113.2	438	119	9.42	.272	.133	2.05
17	F.Gilmore	WAS-N	1886	9/9	75.0	307	75	9.00	.244	.120	2.03
18	W.Beall	NYY-A	1926	20/9	81.2	384	56	6.17	.146	.072	2.02
19	T.Hall	MIN-A	1970	52/11	155.1	619	184	10.66	.297	.148	2.01

Sources

All of the data used for this article comes from the *STATS All-Time Major League Handbook*, the *STATS All-Time Baseball Sourcebook*, the annual *STATS Major League Handbooks*, and the ESPN or MLB web sites. The league BFP totals do not appear in the Sourcebook, so they were estimated as follows: BFP = (3 x IP) + H + BB + HBP - GIDP. Comparing this estimated value of league BFP with the actual value in the recent annual STATS Handbooks leads to agreement within about 0.1%, more than accurate enough for the calculations in this article. A few pitchers' individual season BFP totals are not available in the *All-Time Handbook*, so those were estimated in a similar way, the key difference being that GIDP information is not available for individual pitchers. In those cases [marked with asterisks in the tables below], the GIDP totals were estimated by multiplying the pitcher's IP times the GIDP rate of the league (league GIDP/league IP). Admittedly this is a rough estimate, but there are only eight occurrences on the lists above that fall into this data gap.

Should Sadaharu Oh Be in Cooperstown?

With the influx of Japanese players to the majors, interest in Japanese baseball has risen. One outgrowth of this interest is the question posed by the title of this article. I want to present a thorough examination of Oh's qualifications for Cooperstown, and then report the findings together with my conclusions.

The evidence is divided into three parts: (1) the actual Japanese record, (2) the subjective record, and (3) projections from the statistical record.

THE ACTUAL RECORD

A. Regular Season. It is clear that any candidate from a league of less than major league caliber *must* be dominant in his own situation to even be considered for a plaque in Cooperstown. The Hall of Fame is properly for those who show they were able to dominate major league caliber opposition for a sufficient period of time to be considered great players. While not all of Cooperstown's inductees meet this standard, I have no desire to add to the number of mistakes made in the ranks of Hall of Famers.

Oh was quite dominant in his time and place. He won two consecutive Triple Crowns in 1973 and 1974. He won nine MVP Awards, 18 Best Nine Awards at first, All-Star selections in 20 of his 22 seasons, and nine Gold Gloves. Best Nines are given to one the best player at each position in each league at the end of the season. The Gold Gloves were awarded only in the last nine years of his career, so he won all of them for which he was eligible. He led his league five times in batting average, 15 times in runs scored, three times in hits, 15 times in homers, 13 times in RBI, 18 times in walks, once in doubles, and 14 times in slugging percentage. The triple crown categories are the only ones I have complete top five finishes for, and Oh was in the top five 11 times in average, 20 times in homers, and 19 times in RBI. Another way to look at his seasonal marks is to count how often he met certain standards:

BA	Qty.	OBP	Qty.
≥.300	13	≥.400	17
≥.320	0	≥.450	11
≥.340	2	≥.500	2

SLG	Qty.	HR	Qty.
≥.500	18	≥30	19
≥.600	14	≥40	13
≥.700	9	≥50	3

RBI	Qty.	R	Qty.
≥100	14	≥100	10
≥120	3		

Don't forget that these standards were achieved in seasons of no more than 140 games, and usually of 130 games.

Another way of looking at Oh's record is to consider his career marks. Here Oh is 14th in batting average, first in runs scored, third in hits and doubles, first in homers, RBI, slugging percentage, total bases, and walks, fourth in at-bats, and second in plate appearances. Not only that, but his first-place finishes are often by large margins, such as 311 runs scored, 211 homers, 182 RBI, 547 total bases, 43 points of SLG, and 915 walks. Oh's on-base percentage would be another career record by a significant margin if only the Japanese used it as an official statistic. However, his .445 career on-base percentage is an excellent mark, especially in a good professional league. Oh's actual record appears in a chart at the end of this article.

B. Japan Series. Oh's dominating regular season performances helped his teams win the Central League 14 times, thereby earning a berth in the Japan Series against the best team from the other Japanese league, the Pacific League. Oh's teams won 11 of those series, and he was the MVP of the series once. He played in 77 Japan Series games and hit .281 with 29 homers in 242 at-bats, an on-base percentage of .465 and a slugging percentage of .665. He scored 58 times and drove in 63 runs. Clearly, his performance against the best teams in the Pacific League in those 14 seasons was dominant as well.

C. Exhibitions Against Major Leaguers. Oh played 110 exhibition games against major leaguers in official major league tours of Japan, usually in October or November. He had 338 at-bats

and hit for a .260 average with 88 walks for a .413 on-base percentage. He also slugged 14 doubles and 25 homers among his hits, for a .524 slugging average. A list of the pitchers he took out of the park is below. These numbers include a 0 for 12 in 1960, but it would be appropriate to eliminate those results, since I do not project Oh to have been ready for the majors until 1962. If you eliminate the 1960 results, his marks in the MLB exhibitions will improve somewhat. This performance may have come mostly in parks that were not of major league dimensions. However, it is a dominant performance against pitching which appears to be above the average quality of pitching he would have faced in the majors.

The pitchers (and the year) Oh hit his homers against (lefties are denoted with an asterisk [*], and if a pitcher gave up multiple homers to Oh, the number appears in parentheses) were as follows: Hank Aguirre,* 1962; Nick Willhite,* 1966 (2); Alan Foster, 1966; Joe Moeller, 1966; Jim Brewer,* 1966; Steve Carlton,* 1968; Dick Hughes, 1968; Nelson Briles, 1968; Ray Washburn, 1968; Larry Jaster,* 1968; Wayne Granger, 1968; Frank Reberger, 1970; Frank Linzy, 1970; Pat Dobson, 1971; Jim Palmer, 1971; Dick Hall, 1971; Jerry Cram, 1974 (2); Jerry Koosman,* 1974; John Matlack,* 1974 (3); Tom Seaver, 1978; and Tom Hume, 1978. Further, Oh was pulling even this group of pitchers: 4 to left, 1 to left center, 3 to center, 5 to right center, and 12 to right.

If you looked at the teams Oh played against, you'd think he should have faced some pretty good pitching. In fact, they had three league champions among them. If we project the records of the teams Oh faced, weighted by games against Oh to a major league schedule, the average major league team Oh faced was 92-70. The list of pitchers Oh homered off of supports the belief he was facing good major league pitching. For those who need more proof, let's look at the median (the middle of the group) pitcher Oh homered against. I use the pitcher's ERA the actual year the homer occurred unless the pitcher had less than 50 IP. In that case, I took the ERA for both the season the homer occurred and the next season as well. Oh hit two of his 25 HR against major leaguers against guys with ERAs of 5.00 or more, and there were only four more homers off of a pitcher with an ERA over 4.00. The median pitcher yielding a homer to Oh had a 2.85 ERA. The average ERA was 3.55 in the majors during the period 1962-1975, and the lowest it got for any season for the whole majors was 2.98 in 1968. Thus, one can reasonably say in the exhibitions against major leaguers, Oh got his homers off a better than average group of major league pitchers.

THE SUBJECTIVE RECORD

Oh's critics cannot reasonably deny that he was dominant in his own place and time. Therefore, the critics downplay those accomplishments as having come against inferior pitching and/or in small ballparks. I concede there is some truth in those statements. However, Japanese baseball is a good professional league. Therefore, there are two questions we must try to answer: (1) how good was the quality of play in the Central League in Oh's time, and (2) how does Oh's performance stack up against the level of greatness one needs to achieve to merit induction into Cooperstown?

There are two ways to address this issue in the case of Japanese baseball. The first is the subjective record, namely what baseball people, namely, major league scouts, players, and managers who actually saw Oh play have to say about him. The second method is a statistical projection of Oh's record to a major league equivalent.

Before discussing any further what the *average* quality of play in the Central League in Oh's time was, there is a crucial point to be made. The average quality of opposition is only relevant in helping assess the quality of Oh's play. This point cannot be overstressed, because there is a suggestive, intuitive, and yet seriously flawed logic which operates in situations where a player played in a league described as having less than 20th century major league quality of play on average. The logic I refer to runs something like this: (1) "less than 20th-century major league quality on average" means minor league, (2) therefore, a star in such a league is a minor league star, and (3) minor league stars do not make the Hall of Fame.

The problem with this logic is when it is applied to leagues such as Japan or the Negro Leagues is that there was no major league calling up the best players to play in the majors, thereby skimming the cream of the crop. Both the Negro Leagues and Japan (until recently), no matter the exact quality of play, were the pinnacle of competition the players in those leagues could reasonably aspire to compete in. The stars of the Negro Leaguers were almost invariably major league quality players, and often of Hall of Fame quality. Perhaps the Japanese stars are not as frequently of Hall of Fame quality, but their stars surely are of major league quality. In each case, the stars of those leagues were denied the opportunity to perform on a major league stage through no fault of their own. In short, the average quality of such a league cannot be used as a shorthand method for evaluating players.

With that cautionary note, the most common assessment of the quality of Japanese baseball is it is equal to the highest level of the minors, perhaps even a tad better. For examples of this assessment, see McNeil's *Baseball's Other Stars*, page 113,

or Fred Ivor-Campbell's article on Oh at page 35 of the 1992 edition of *The National Pastime*.

A problem for Oh's detractors is that he accomplished his actual record in far shorter seasons (an average of over 20% shorter). In response, they could try to argue that players wear down in a longer season, not an incorrect statement. However, this does not deal with Oh specifically, nor does it deal with the fact that the Japanese of Oh's time trained in a manner major leaguers of the same era would have regarded as fanatical. It is important to note that Oh was frequently singled out as being especially hardworking, even among the Japanese. How hard did the Japanese of that time and/or Oh train? Here's what William Chapman wrote in the July 13, 1978, *Washington Post*:

> [T]he common complaint of . . . Americans who play baseball in Japan [is] fatigue. Japanese players train like demons the year round and the . . . foreigners must keep up . . . A 6:30 p.m. . . . game is preceded by five hours of exercise, practice and team meetings. It is the greatest shock for American players who come to Japan accustomed only to shagging a few fly balls and belting a couple of practice balls before game time.

Frank Deford underscored Oh's work in the August 15, 1977, *Sports Illustrated*:

> For a 1:30 game, Oh arrives at 10:30 . . . Oh gets no respite from this enervating routine. After almost a half an hour in the batting cage, he goes to the clubhouse, where, lest he grow rusty, he swings a bat in front of a full-length mirror for another 10 minutes. Then he hies himself back to the diamond, where a coach spends 15 minutes or so slapping hard grounders just past his reach, so that he must run and stretch for every one. Here he is, 37 years old, the finest player in the game . . . being worked over daily in the noon heat of summer. Off days—especially after a defeat—mean grueling two- or three-hour team practices. But every player endures this schedule, and Oh-san endures it best . . . Late every season, when most players' averages are falling even faster than their weights, Oh finishes with an inhuman rush.

A guy who fits this profile could almost certainly handle a longer schedule and still maintain his level of play. Therefore it is only appropriate to allow him more playing time when we compare him to major leaguers. Thus his already heady accomplishments will be increased by another 20% before we get to the task of making the appropriate adjustments to allow

for the smaller parks and the lesser quality of pitching. Common sense dictates the difference between the majors and a AAA or better league cannot be large enough to drop Oh below the level of legitimate HOFers.

Tetsuya Usami's book *Oh and Nagashima: Every Record* also tells us Oh hit 612 homers to "right" and 140 to "right center," with the remaining 116 to all other fields. In short, Oh was a dead pull hitter. In fact, the Japanese teams routinely played a shift very much like the one Ted Williams faced in the majors. Oh managed to drive balls through or over the reduced space presented by such a shift often enough to average over .300 for his career. The larger dimensions of major league parks would have ensured that he would have had more outfield room to work with, which would certainly be to his advantage.

Another issue is whether or not Oh had a real opportunity to come to the majors. In an interview with *Baseball Weekly*, August 14, 1997, Oh said that if he had had the chance, he would have wanted to play in the majors, but that he didn't have that chance. An examination of the history of Japanese baseball's relations with American baseball shows Oh's contention is credible.

In 1967, after the Murakami affair, the major league and Japanese owners signed a "Working Agreement" which governed their relationship. A key provision was that each side would respect the other's rights to players. At the time, both sets of owners had reserve clauses they used to keep players tied up indefinitely. Both sets of players were, in Robert Whiting'e apt description in *The Meaning of Ichiro*, "indentured servants". In 1975, free agency became a part of the major league scene, nevertheless, the majors continued to honor the "Working Agreement. "Japanese players and their union were much more docile than their major league counterparts. Free agency didn't come to Japanese baseball until 1993, and even then player agents were banned from the negotiating process.

While it is true the loophole Nomo exploited in 1995 existed from the beginning of this agreement, it was a fine enough legal point that no one discovered for 28 years. Even if a daring Japanese player had found it and tried to exploit it before free agency came to the majors in 1975, it is unlikely major league owners would have been receptive to aiding a threat to anyone's reserve clause. Once their own reserve clause became ineffective, it is possible they would have been more open to such a possibility. However, by that time Oh was 35 and would not have been a good candidate to succeed in such a maneuver. Thus, Oh would have had to find the loophole early enough in his career to be an attractive free agent, retire from his well-paying job in Japan, face intense public pressure against the move, and try to get the major league owners to sign him.
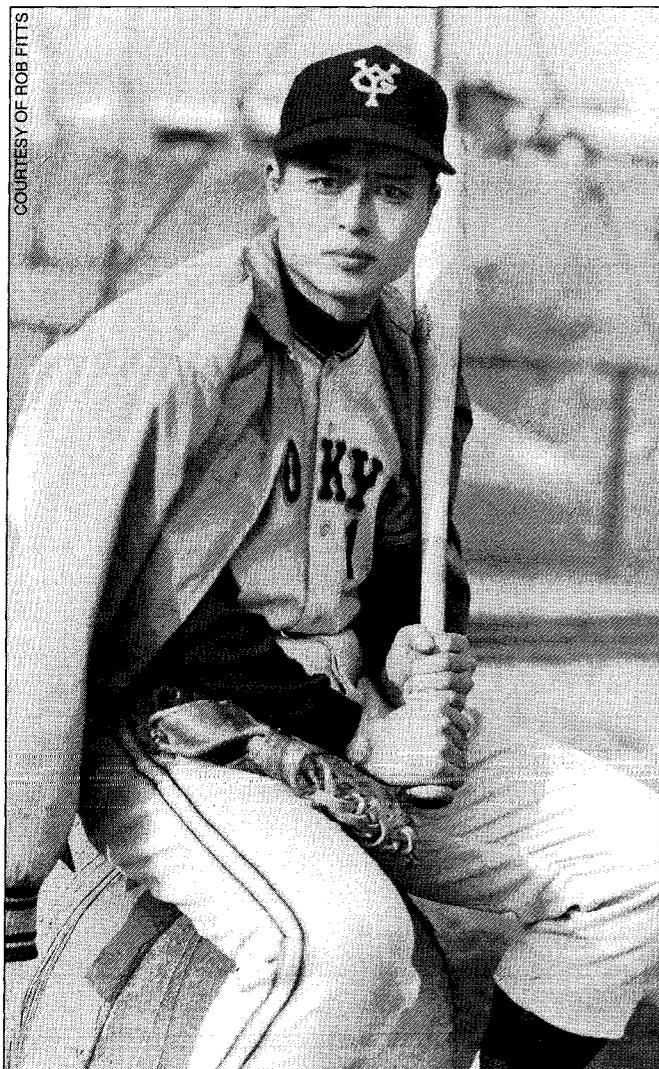
Sadaharu Oh

Now we can look at actual quotes. These quotes are quite impressive, and unless otherwise noted come from an appendix in Oh's autobiography. What I find even more impressive is the complete absence of quotes by major league types who saw or played against Oh indicating he wasn't a very impressive player. The most negative quotes from major league players, coaches, scouts, and executives who actually saw Oh play I was able to find were statements he was not in a class with Aaron, Ruth, and perhaps Mays. Since Oh and I don't contend he was in that class, such statements aren't tremendously revealing on their face. If such quotes reveal anything beyond generally accepted wisdom, they can probably best be seen as a backhanded way of saying he was very good, probably even HOF quality. If you want to say a guy isn't very good, you don't compare him to some of the very best guys in the history of the game. The quotes I have chosen follow:

Davey Johnson (the only man to have been a teammate of Oh and Aaron)[The Sporting News, January 7, 1978, page 37]: "Oh would have hit 700 homers over here. He would be a good hitter anywhere in the world. Quality is still quality."

Davey Johnson again, this time from Deford's Sports Illustrated article: "You couldn't find a better [fielding] first baseman."

Tom Seaver: "He sure hit me. He was a superb hitter. He hit consistently, and he hit with power. If he played in the United States, he would have hit 20-25 home runs a year, and what's more, he'd hit .300. He'd be a lifetime .300 hitter. He had tremendous discipline at the plate. He knew the strike zone extremely well . . . .He could pull your hard stuff, and you couldn't fool him off-speed."

Hal McRae: "Oh had tremendous patience as a hitter . . . He had good power. I don't know how many [homers] he would have hit here . . . . He was a great all-star. He'd have been a Hall of Famer."

Pete Rose: "There's no question in my mind he wouldn't have hit 800 home runs if he'd played here, but if he played in a park tailored to his swing, he'd have hit his 35 [homers] a year. . . He'd hit .300, I'll tell you that."

Don Baylor: "Oh could have played anywhere at any time. If he played in Yankee Stadium, being the left-handed pull hitter he is, I have no doubt he'd hit 40 home runs a year."

Frank Howard: "You can kiss my ass if he wouldn't have hit 30 or 35 home runs a year and hit anywhere from .280 to .320 and drive in up to 120 runs a year. The point being, he rates with the all-time stars of the game."

Greg Luzinski: "There's no question he'd have been a great player in the United States, that he was a super talent."

Brooks Robinson: "He could have played right here in the big

leagues with the best players in the world. He would have hit here. Not as many home runs, but he would have hit his share and hit for average. He was just an outstanding hitter."

Frank Robinson: "I'm sure he would have hit in the 30's [of homers per year] and probably in the low 40's. . . . Thirty home runs a year add up to over 600 home runs, and he'd do that if he played the same number of years here that he played there."

Don Drysdale: "He would have hit for average and power here. In a park tailored to his swing, there's no telling how many he would have hit. . . . He was always ready for anything we threw him. We were all impressed."

STATISTICAL ANALYSIS

A. My Projection. I will use projections because they place the accomplishments for a player from a non-major league situation into a readily understood context, namely major league performance. Once we have such a readily understood context, it is easier to get a reasonable fix on the quality of the player.

I compared the records of all players who played in Oh's Central League during his career who also played in the majors. I matched the lesser total of at-bats to those nearest in time in the league with more at-bats, prorating totals within a season. I was able to add a home park home run adjustment, but not none for the other statistics. The reason for this is the only available data resembling home/road splits is for Oh's homers, because apparently home/road split data is rarely if ever kept in Japan. If you need a more detailed explanation of the methods used to arrive at my adjustment figures, see www.baseballguru.com/jalbright/analysisjalbright08.html.

The adjustment factors derived from the study of players who played in both the majors and the Central League during Oh's time are as follows:

Hits	2B	3B	HR	BB
0.904	0.829	2.149	0.524	1.148

I will use Oh's actual Japanese total of walks without any upward adjustment for playing time because he already has what would be a major league record number of walks. If I used the adjustment figure given above multiplied by the factor for additional playing time instead, he would be projected for 39% more walks than he actually got. This seems too high, so I chose a much more conservative evaluation. Similarly, I chose to use Oh's actual career stolen base figure of 84 because stolen bases are of no real import in assessing his career.

In order to deal with playing time issues, I had to use season by season data to make my projections. However, the adjustment factors are designed for Oh's entire career, not individual

seasons. Therefore, I will not use the single-season projections to evaluate Oh's worthiness for the HOF. Instead, I will restrict myself to working with the career totals estimated for Oh, as these totals are within the intended bounds of the adjustment figures. Lest I be accused of hiding unfavorable data, the projection is available in the tables at the end of the article.

I will drop Oh's first three seasons on the grounds he wouldn't have reached the majors until 1962. Even after significant downward adjustments, Oh's career line is still most impressive:

G	AB	H	2B	3B	HR	BB	AVG	OBP	SLG
2995	9939	2778	372	39	527	2235	.279	.412	.484

It is most interesting that this projection closely resembles (a) his actual performance in exhibitions against major leaguers, and (b) the anecdotal assessments major leaguers made of him.

One way to examine Oh's career line is to determine who the most similar retired players are (as of the end of the 2003 season) to Oh's projection using Bill James's similarity scores. The 11 most similar players (due to a 10th-place tie) are:

Player	Similarity Score
Reggie Jackson	851
Eddie Murray	844
Willie McCovey	841
Mel Ott	823
Harold Baines	812
Frank Robinson	806
Billy Williams	803
Dave Winfield	801
Tony Perez	788
Mickey Mantle	783
Ernie Banks	783

The top eight are at the level James would describe as "somewhat similar" to the Oh projection, and the rest as "vaguely similar." This is further proof Oh is HOF quality, in that the very best players tend to be unique and therefore do not have many players truly similar to them. If you look at the average of these 11, you'd have a player who is close to the projection for Oh. The comparison of the composite and the Oh projection are:

COMPOSITE

G	AB	H	2B	3B	HR	BB	AVG	OBP	SLG
2724	9675	2753	465	67	490	1266	.285	.367	.498

OH PROJECTION

G	AB	H	2B	3B	HR	BB	AVG	OBP	SLG
2995	9939	2778	372	39	527	2235	.279	.412	.484

SADUHARU OH REGULAR SEASON STATISTICS

Year	G	AB	R	H	2B	3B	HR	TB	RBI	K	BB	AVG	OBP	SLG
1959	94	193	18	31	7	1	7	61	25	72	24	.161	.253	.316
1960	130*	426	49	115	19	3	17	191	71	101	67	.270	.369	.448
1961	127	396	50	100	25	6	13	176	53	72	64	.253	.357	.444
1962	134*	497	79*	135	28	2	38*	281*	85*	99	72*	.272	.364	.565*
1963	140*	478	111*	146	30*	5	40*	306*	106	64	123*	.305	.448	.640
1964	140*	472	110*	151	24	0	55*	340*	119*	81	119*	.320	.457	.720*
1965	135	428	104*	138	19	1	42*	285*	104*	58	138*	.322	.488	.666*
1966	129	396	111*	123	14	1	48*	283*	116*	51	142*	.311	.493	.715*
1967	133	426	94*	139	22	3	47*	308*	108*	65	130*	.326	.484	.723*
1968	131	442	107*	144	28	0	49*	319*	119	72	121*	.326*	.471	.722*
1969	130*	452	112*	156*	24	0	44*	312*	103	61	111*	.345*	.474	.690*
1970	129	425	97*	138*	24	0	47*	303*	93	48	119*	.325*	.472	.713*
1971	130*	434	92*	120	18	2	39*	259	101*	65	121*	.276	.434	.597*
1972	130*	456	104*	135	19	0	48*	298*	120*	43	108*	.296	.431	.654*
1973	130*	428	111*	152*	18	0	51*	323*	114*	41	124*	.355*	.500	.755*
1974	130*	385	105*	128	18	0	49*	293*	107*	44	158*	.332*	.527	.761*
1975	128	393	77*	112	14	0	33*	225	96*	62	123*	.285	.455	.573
1976	122	400	99*	130	11	1	49*	290	123*	45	125*	.325	.486	.725*
1977	130*	432	114*	140	15	0	50*	305*	124*	37	126*	.324	.477	.706*
1978	130*	440	91	132	20	0	39	269	118*	43	114*	.300	.444	.611
1979	120	407	73	116	15	0	33	230	81*	48	89*	.285	.413	.565
1980	129	444	59	105	10	0	30	205	84	47	72	.236	.343	.462
Total	2831	9250	1967*	2786	422	25	868*	5862*	2170*	1319	2390*	.301	.445	.634*

JAPAN SERIES

Year	G	AB	R	H	2B	3B	HR	TB	RBI	K	BB	AVG	OBP	SLG
1959	3	5	1	1	1	0	0	2	0	3	2	.200	.429	.400
1961	6	16	1	5	0	0	1	8	2	4	8	.313	.542	.500
1963	7	27	6	6	0	0	4	18	7	1	3	.222	.300	.667
1965	5	15	6	4	0	0	3	13	4	3	6	.267	.476	.867
1966	6	22	6	7	1	0	2	14	4	5	7	.318	.483	.636
1967	6	17	6	4	1	0	2	11	6	2	9	.235	.500	.647
1968	6	20	4	7	1	0	3	17	8	4	6	.350	.500	.850
1969	6	22	6	5	0	0	2	11	7	1	4	.227	.346	.500
1970	5	15	5	5	0	0	2	11	3	1	8	.333	.565	.733
1971	5	14	5	3	0	0	2	9	5	4	6	.214	.450	.643
1972	5	16	4	7	1	0	1	11	2	1	6	.438	.591	.688
1973	5	14	2	4	0	0	2	10	5	2	6	.286	.500	.714
1976	7	20	4	7	1	0	3	17	7	2	9	.350	.552	.850
1977	5	19	2	3	0	0	2	9	3	4	3	.158	.273	.474
Total	77	242	58	68	6	0	29	161	63	37	83	0.281	0.465	0.665

VERSUS MAJOR LEAGUERS

Year-Opp.	G	AB	R	H	2B	3B	HR	TB	RBI	K	BB	AVG	OBP	SLG
1960-SF	8	12	0	0	0	0	0	0	0	8	0	.000	.000	.000
1962-Det	10	31	6	7	2	0	1	12	4	11	4	.226	.314	.387
1966-LAN	18	61	15	21	3	0	5	39	14	14	14	.344	.467	.639
1968-StL	18	59	13	21	6	0	6	45	15	12	17	.356	.500	.763
1970-SF	1	3	3	3	0	0	2	9	3	0	3	1.000	1.000	3.000
1971-Bal	18	54	6	6	1	0	3	16	5	12	16	.111	.314	.296
1974-NYM	18	59	11	19	2	0	6	39	14	12	18	.322	.481	.661
1978-Cin	17	53	4	11	0	0	2	17	7	9	15	.208	.382	.321
1979-ASG	2	6	0	0	0	0	0	0	0	3	1	.000	.143	.000
Total	110	338	58	88	14	0	25	177	62	81	88	.260	.413	.524

MAJOR LEAGUE EQUIVALENTS

Year	G	AB	H	2B	3B	HR	TB	BB	AVG	OBP	SLG
1962	162	601	148	28	5	24	258	72	.246	.326	.430
1963	162	553	153	30	12	24	279	123	.276	.408	.504
1964	162	546	158	23	0	33	280	119	.289	.416	.513
1965	156	495	144	19	3	25	244	138	.291	.446	.493
1966	156	479	134	15	3	30	245	142	.281	.445	.512
1967	161	515	152	21	8	30	279	130	.295	.437	.542
1968	158	534	157	28	0	31	278	121	.295	.425	.521
1969	162	563	176	24	0	29	287	111	.312	.425	.510
1970	161	530	155	24	0	31	272	119	.294	.423	.514
1971	162	541	135	21	5	25	241	121	.250	.387	.446
1972	155	544	145	19	0	30	254	108	.268	.389	.468
1973	162	533	171	20	0	33	290	124	.321	.449	.544
1974	162	480	144	19	0	32	259	158	.301	.474	.539
1975	159	490	126	13	0	22	205	123	.258	.407	.419
1976	152	498	146	11	3	32	259	125	.294	.435	.520
1977	162	538	158	14	0	33	271	126	.293	.427	.503
1978	162	548	149	22	0	25	246	114	.271	.397	.449
1979	150	507	131	14	0	22	211	89	.258	.368	.416
1980	129	444	95	7	0	16	150	72	.214	.323	.338
Total	2995	9939	2778	372	39	527	4809	2235	.279	.412	.484

Another use for the list of most similar players is to look at how many of them are in Cooperstown. The list has 10 men already in the Hall. Seven of those already in were first-ballot selections, and it is likely Ott would have been also except that he came up for consideration while they were still catching up with the greats from earlier times. Baines *may* get in, but he's a long shot. However, he is inferior in quality to the Oh projection. Frankly, no matter how one looks at the list of most similar players, the conclusion is the same: Oh is clearly HOF quality.

B. Other Projections. Bill McNeil did a similar projection of Oh's career stats for his book, *King of Swat*. His projection was based on 550 at-bats, and I will put my projection in the same terms.

	AB	H	2B	3B	HR	AVG	SLG
McNeil	550	156	30	6	23	.283	.485
Albright	550	154	21	2	29	.280	.484

As you can see, they are rather similar. We both project Oh to be worthy of the HOF. In fact, Mr. McNeil in *Baseball's Other Stars* rates Oh as the third best first baseman of all time, behind Gehrig and Foxx.

THE "NATIONAL" HALL OF FAME
One last argument against Oh's induction: the contention that Cooperstown is the National Hall of Fame and is therefore limited to those who have contributed to the game in North America. There is no formal restriction on those the Hall of Fame may honor. Even if such a restriction exists, it certainly can be changed as easily and rapidly as the sudden decision to allow

Negro Leaguers to be honored on an equal basis with the major leaguers. In fact, the Hall's own Mission Statement discusses a "global audience." Further, the Hall should honor *all* the best players in the game, no matter where they played or who they played against, because they all have helped to make it the great game it is.

Moreover, the game is becoming increasingly international in scope. In 2002, nearly one in four major leaguers was born outside the United States—17 different countries are represented in the majors, and 31 in the minors. About half of all minor leaguers were born outside the U.S.A. We now have major league all-stars from the Orient, and we will undoubtedly have more now that those outside North America may vote for the all-star teams. Under such circumstances, the "national" argument seems to me to be hopelessly parochial.

Oh has had a tremendous influence on Japanese baseball as its greatest player, as one of its goodwill ambassadors, and as a successful manager. He came into contact with many major leaguers, and his career has touched modern major league managers like Jim Tracy, Davey Johnson, Charlie Manuel and Bobby Valentine.

The "national" argument is at best a dinosaur, doomed to extinction by the existing trend toward international growth in the game. Eventually, I believe the majors will have a permanent presence in Japan, and at that point baseball will need to please its Japanese fans. When that occurs, the "national" argument will surely fall.

For all the reasons set forth above, he richly deserves a plaque in Cooperstown, and I submit it is likely that it will happen.

Holiday Doubleheaders

Some teams today don't even play a single game on a holiday, providing a stark contrast to the many years when the holiday doubleheader was a staple of the major league baseball schedule. From the 1890s through the 1950s, most major league teams were scheduled to play two games on each of the three national holidays that occurred during the baseball season—Memorial Day on May 30 (originally known as Decoration Day), Independence Day on July 4, and Labor Day on the first Monday in September.

At first, two-game sets on holiday dates were twin bills, or separate-admission morning and afternoon games, not the now conventional two-for-one, single-admission doubleheader. Typically, the morning game started around 10:00 and the afternoon game at 3:00. Back-to-back afternoon games for one admission wouldn't become standard fare on a holiday until the 1920s.

Indeed, the term "twin bill" originally referred to two separate games on the same day, in direct contrast to "doubleheader," which referred to two consecutive games for a single admission. By the 1940s, twin bill had become a synonym for doubleheader, with little or no divergence in meaning between the two terms.

The first holiday twin bills in the major leagues were held in the National League on Independence Day in 1881. Two cities, Buffalo and Detroit, hold the distinction of staging the first holiday twin bills, as on July 4, 1881, Buffalo hosted Troy while Detroit hosted Worcester.

There was little newspaper fanfare about the novel holiday twin bills, since the nation was in a somber mood with President Garfield on his deathbed after being shot by an assassin. Detroit won both its holiday games with Worcester. In Buffalo, Mickey Welch pitched and won both games for Troy, as the *Buffalo Express* remarked, "In the afternoon contest the stands were filled to sardine compactness and the assemblage was very enthusiastic."[1]

CHARLIE BEVIS writes baseball history from his home in Chelmsford, Massachusetts. He is the author of the 2003 book *Sunday Baseball: The Major Leagues' Struggle to Play Baseball on the Lord's Day, 1876-1934* and the 1998 biography *Mickey Cochrane: The Life of a Baseball Hall of Fame Catcher.*

The two-game slates in Detroit and Buffalo were ploys by team owners located in small cities to improve their club finances by attracting larger crowds on a day most working people had off, a problem that Chicago and Cleveland did not need to contend with in their Fourth of July contests. As the *Worcester Evening Gazette* reported, "There were good crowds at the Western games: 8500 in Chicago, 5000 in Cleveland, 1500 at the first game in Buffalo and more in the afternoon, over 2000 at the morning game in Detroit, and over 3600 in the afternoon."[2]

Troy captured the essence of the twin bill concept in the two games it hosted on Decoration Day in 1882, the first time teams played two games on that holiday. Not only were separate games played in the morning and afternoon between Troy and Chicago, but the games were also staged at separate venues. The afternoon game was played on Troy's regular grounds, after the morning game had been played five miles down river near Albany.

The attempt to increase overall attendance for the day by staging the morning game at a different location than its regular grounds didn't pay off for Troy. Less than 700 people witnessed the morning game at the Greenbush grounds outside Albany. Four times as many showed up at the afternoon game in West Troy, where the *Troy Daily Times* reported the attendance to be 2,878. The afternoon crowd may have even been inflated by this *Albany Morning Express* newspaper report: "The witching announcement that 50 good-looking girls from a leading collar shop here have expressed their intention to attend in a body the Decoration Day game in West Troy will doubtless secure a goodly representation of our lahdedah youths."[3]

Holiday twin bills soon became economically important to all teams, not just the weaker franchises in smaller cities. In the National League before Sunday baseball was adopted for the 1892 season, holidays were the only time that most working people could attend a ball game. A six-day work week was then common practice, with Sunday the only day off for most people. Working people swelled attendance figures for holiday games, at a time when team owners predominantly sought to attract middle- and upper-class patrons as a measure of respectability. In the competing American

Association, where Sunday baseball was played in many cities and working people could more easily attend games, holiday twin bills were less essential to team finances, but were nonetheless an important source of revenue.

In addition to Troy's use of alternate locations for two games in a twin bill, another technique used to differentiate the two games in several early holiday twin bills was to have the home team play one team in the morning game and a different team in the afternoon game.

On Decoration Day in 1883, Boston and Providence hosted twin bills in their cities, with their opponents, Cleveland and Buffalo, shuttling by train between the two cities. After a morning game in Boston, Cleveland took the train to Providence for an afternoon game with that team. Likewise, Buffalo played a morning game in Providence and took the train to Boston for an afternoon contest there.

Similar twin bill setups occurred at this time between New York and Philadelphia in the National League as well as in the American Association between Brooklyn and the Metropolitan team from New York. There was a snag, though, during the 1885 Decoration Day twin bills in Boston and Providence. After Chicago played a morning game in Providence, the train was late getting into Boston due to rainy weather and the start of the afternoon game there was delayed 45 minutes. The Chicago-Boston game was stopped in the fourth inning by the rain and thus did not constitute a complete game to count in the standings.

The demise of the double-switch twin bill came after Brooklyn and Metropolitan switched opponents in a holiday twin bill on Decoration Day in 1886 (which was played on May 31 since the 30th was a Sunday, the general rule for holidays falling on a Sunday). Providence left the National League after the 1885 season and the Metropolitans from the American Association after 1887, resulting in fewer proximate league cities to efficiently stage a double-switch twin bill.

But the 1886 Decoration Day twin bill in Brooklyn was very telling for another reason—the attendance. Brooklyn's two games with Cincinnati and Louisville on the holiday were "played before the largest assemblage of spectators ever seen on the Washington Park ball grounds, over thirteen thousand people witnessing the two games played there on Decoration Day."[4]

Attendance became so large for holiday twin bills that the holidays attained significant political importance in the development of league schedules. For instance, in 1888, the New York Times reported the displeasure of New York owner John Day about the holiday scheduling. "On Decoration Day the Pittsburg nine—a club that does not draw well—is scheduled to play here, and on the Fourth of July the Giants are booked to play in Detroit," the Times wrote. "On the whole, as Mr. Day remarked, the Philadelphia Club got all the plums, and it is surprising to him that Manager Wright, in his effort to eclipse all past performances, even allowed the tree that bore the fruit to remain."[5]

Up until 1888, holiday scheduling could be relatively simple, as each team could be allocated one holiday date, there being eight teams in each of the National League and American Association to divvy up the eight home dates for Decoration Day and Fourth of July (holidays which interestingly always fell on the same day of the week). Labor Day changed all that.

Several states began to officially celebrate Labor Day in 1888, notably New York, Massachusetts, and Pennsylvania, before it became a national holiday in 1894. In 1888, two teams rearranged their schedules, not an uncommon occurrence in those days, to play a twin bill on the new state holiday in September—Boston in the National League and Brooklyn in the American Association. In 1889, the leagues began to recognize the Labor Day holiday in their preseason schedules, as well as grapple with the consequences of dividing up 12 holiday dates among eight teams.

Labor Day brought about new approaches such as three games in one day (at Brooklyn in 1890 and at Baltimore in 1896) and a home-and-home twin bill between New York and Brooklyn in 1903. However, the introduction of this third holiday also significantly elevated scheduling politics, since it was inevitable that some teams would get two holiday dates during a year, while others would get just one.

It was not until the late 1930s that holiday scheduling achieved a level of symmetry and relative equity among teams in a league. In the 40 or so years following Labor Day scheduling in 1889, holiday scheduling was by necessity intertwined with Sunday scheduling. Even though the National League had dropped its prohibition on Sunday baseball for the 1892 season after its merger with the American Association, there was the matter of the "where legal" conditional clause in its new policy. At the turn of the century, Sunday baseball was legal only in the National League cities of St. Louis, Chicago, and Cincinnati (it was legal also in Louisville, which was dropped from the league after the 1899 season).

The ability to play baseball on Sunday, the only day other than holidays that working people could generally attend a baseball game, was an enormous facet of baseball economics around the turn of the century. Consequently, cities where Sunday baseball could be played generally were not allocated

holiday dates, these instead being reserved mainly for cities without the ability to generate large crowds by playing on Sunday. For instance, during the three years 1895 to 1897, Sunday-playing St. Louis received just one holiday date while Sabbath-observing New York and Philadelphia hosted games on all nine holiday dates (at the time, both teams did not even play road games on Sunday to earn a visitor's share of a Sunday gate).

This bias toward eastern cities for holiday dates continued for many years, and after the turn of the century extended to western cities that couldn't play Sunday baseball. Cleveland had an over-allocation of holiday dates in the American League until the Sunday law was changed there for the 1911 season. Pittsburgh used its Sunday-law prohibition to gain excess holiday dates for three decades. Until Pennsylvania law was changed to permit Sunday games in the 1934 season, Pittsburgh was a host team for all three holiday dates every year from 1903 to 1933.

Another factor in holiday scheduling was the Boston holiday wrinkle, which was created in the 1901-1903 turf battle between the established National League team and the upstart American League entrant. In 1901 the Boston Americans, looking to attract fans from their rival Boston Nationals, booked two games for June 17, which was Bunker Hill Day, a city holiday. Then the following year, the National League team scheduled two games for April 19, which was Patriots Day, a state holiday.

Patriots Day and Bunker Hill Day became staples of the holiday schedules for both Boston teams, typically alternating each year between the two teams. For instance, in 1913, the Braves hosted a Patriots Day twin bill and the Red Sox a Bunker Hill Day twin bill; in 1914, the Red Sox had the Patriots Day games and the Braves the Bunker Hill Day games. Because both Fenway Park and Braves Field were near the route of the Boston Marathon, which is conducted on Patriots Day, spectators at the morning game of the twin bill could exit the grounds to watch the marathon runners pass by on their way to the finish line and then return to watch the afternoon game.

As the automobile became a more mainstream mode of transportation and other amusement activities gained popularity on holidays, the morning/afternoon fixture of the holiday twin bill gradually declined and converted to a single-admission doubleheader. By 1916, the St. Louis Cardinals and Browns were both playing single-admission holiday doubleheaders, a concept that gained popularity during the war years of 1917 and 1918 as teams tried to attract spectators to empty ballparks.

CHRONOLOGY OF HOLIDAY TWIN BILLS

Holiday	First Played	Last Full Schedule	Last Scheduled
Memorial Day	1882	1957	1981
Independence Day	1881	1956	1984
Labor Day	1888	1958	1983

(Two-game sets, either separate or single admission)

After World War I ended, clubs in Boston and St. Louis as well as the New York Yankees regularly scheduled single-admission doubleheaders on holidays, while the other clubs stayed with the traditional structure of morning and afternoon games. Newspapers usually designated box scores of single-admission doubleheaders as "first game" and "second game" while box scores of separate-admission twin bills were typically labeled "morning game" and "afternoon game."

One reason for the change to single-admission holiday doubleheaders after World War I was that Sunday baseball came to the East Coast. Legal blessings for Sunday baseball in Washington, D.C., in 1918 and New York in 1919 lessened the financial pressure on eastern teams to schedule two separate games on a holiday. By 1924, more than half of the holiday slates were single-admission doubleheaders rather than separate-admission twin bills. By 1930, only the two Philadelphia teams and Pittsburgh were not playing doubleheaders on national holidays, because these three clubs were the last major league teams not able to play Sunday baseball.

A second reason was that Sunday doubleheaders became popular in the 1920s, as teams that could legally play Sunday games began to schedule single-admission doubleheaders on Sunday to maximize attendance (and eliminate a poorly attended weekday game). Fans began to expect that two games on one day would be a single-admission event, not requiring separate admissions. Sunday doubleheaders escalated in frequency during the Great Depression, when baseball owners were desperate to balance their books, thus rendering the holiday twin bill virtually obsolete.

Once Pennsylvania law finally permitted Sunday baseball for the 1934 season, holiday schedule allocations became more straightforward. Teams rotated schedules for playing two holidays one year and one holiday the next year. For instance, in 1937, the National League teams in Brooklyn, Chicago, New York, and St. Louis hosted two holiday dates and Boston, Cincinnati, Philadelphia, and Pittsburgh had just one holiday date. In 1938, the reverse was the case, with the

latter teams hosting two holiday dates and the former teams just one.

For the 20+ years from 1934 to 1958, the single-admission holiday doubleheader was a fixture on the major league schedule, with just a few exceptions:

» Brooklyn reinstituted separate admissions for two-game sets at Ebbets Field in 1947 in a quest to accommodate all spectators that wished to see the popular Dodgers play in the tiny ballpark (and to shore up the fiscal condition of the club). The New York legislature tried to stop the Dodgers from charging separate admissions for games played on the same day, with passage of the Murphy-Rosenblatt bill in 1950, but Governor Thomas Dewey vetoed the bill when it got to his desk. After Walter O'Malley took over leadership of the Dodgers, the club reverted to single-admission holiday doubleheaders.[6]

» Boston teams continued separate-admission twin bills for the unique Boston holidays of Bunker Hill Day and Patriots Day, which were last scheduled during the 1949 and 1955 seasons, respectively.[7]

» Kansas City played morning/afternoon holiday twin bills from 1956 to 1958, as the relocated Philadelphia Athletics tried to increase revenue.

Attendance for holiday games began to decline, though, by the 1950s. The last year that major league baseball had a full slate of holiday doubleheaders for all three national holidays was 1956. Night baseball, along with franchise relocations, hastened a swift decline in holiday doubleheader scheduling. Working people, now with a standard 40-hour five-day work week, could attend games on Saturday and during the week at night, greatly lessening the promotional value of the second "free" game of a doubleheader. A wider variety of holiday leisure activities also drew fans away from attending holiday doubleheaders.

By 1970 less than half the major league game schedule for the three holidays consisted of doubleheaders, with the rest being single games, many played as night games. The last year that at least one doubleheader was played on each of the three holidays was 1981, and even then the July 4 doubleheader at Seattle was a twi-night affair starting at 6:00. There were no doubleheaders scheduled for Memorial Day in 1982, and the last scheduled holiday doubleheader was conducted in San Francisco on July 4, 1984.

Romanticized memories of the traditional holiday doubleheader have been periodically rekindled over the 20 years following the last scheduled holiday doubleheader in 1984, as teams sporadically play a holiday doubleheader on an ad hoc basis with the second game making up an earlier postponed game. For example, the Chicago Cubs hosted a doubleheader on July 4, 1994, to make up a previous rainout.

However, the reality of the time required to complete two baseball games today quickly settles in, and was magnified in the 1994 holiday doubleheader in Chicago. Whereas two holiday games used to be played in about five hours, the 1994 Fourth of July doubleheader at Wrigley Field lasted an agonizing 10 hours. The second game spanned seven and a half hours, due to three rain delays and six extra innings.

"It's the longest doubleheader I've ever been involved in," Cub catcher Rick Wilkins said after the game. "We even ran out of food. That's a long day right there."[8]

The holiday doubleheader should not be forgotten, as for decades it helped to build attendance in the major leagues. But don't look for its return to the major league schedule any time soon.

Notes
1. *Buffalo Express*, July 5, 1881.
2. *Worcester Evening Gazette*, July 5, 1881.
3. *Troy Daily Times*, May 30, 1882, and May 31, 1882; *Albany Morning Express*, May 29, 1882.
4. *Brooklyn Daily Eagle*, June 1, 1886.
5. *New York Times*, April 4, 1888.
6. *New York Times*, March 23, 1950, and April 12, 1950. "This is still a free country," Governor Dewey observed in vetoing the bill. In a memorandum, Dewey wrote, "It is not the business of the state to determine by law when baseball games shall be played in the absence of any showing that the health, welfare or safety of the people is involved."
7. Both holidays had brief twin bill scheduling revivals, Bunker Hill Day in 1955 and Patriots Day from 1963 to 1967. Today, Boston retains a vestige of that morning/afternoon holiday twin bill with the 11:00 a.m. start every year for a single game played on Patriots Day, which now occurs on the third Monday in April rather than fixed on April 19. This tradition began in 1968.
8. *Los Angeles Times*, July 5, 1994.

The .400 Club

Since the National League started in 1876, there have been only 28 seasons in which a batter finished with a batting average of .400 or higher. Wanting to see how different players had achieved the rare feat of batting .400, I used many different sources to compile different "splits" about each and every .400 season. I inputted the game-by-game stats into a database for each player to calculate statistics that I think help compare the .400 hitters, from Ross Barnes to Ted Williams. If nothing else, they provide some interesting facts about each of these fantastic batting seasons, such as the four times that a player reached .400 in the final game of the season, including one batter who did it twice!

A NOTE ABOUT THE STATS

I used the standard interpretation for batting average (H/AB) for all seasons, even those from 1876 and 1887, in which walks were 0-for-1s (1876) or 1-for-1s (1887). Also, I included only those players who qualified for the batting title that season as the cutoff for .400; seasons like Craig Wilson's .468 average in 1998 (22-for-47) aren't included. While compiling the splits for these seasons, I found a few errors in official totals, which I have incorporated into these splits. See the section titled "Why Some Numbers Are Different" to see which numbers are different from what most books have and why the change was made.

EXPLANATIONS FOR THE CHARTS

The categories are mostly self-explanatory, but definitions should be given just for clarity. The categories 1+H, 2+H, 3+H, etc., mean "games during the season in which the player had at least 1 hit (or games with at least 2 hits, 3 hits, etc.) with the percentage of games of that variety in parentheses.

The APR, MAY, JUN, etc., categories are the batting averages the player had in that particular calendar month, with the aggregate AB and H totals in parentheses.

The "home" and "away" categories list the batting average the player had at their home park and at away parks during the season, with the aggregate AB and H totals in parentheses.

TRENT McCOTTER is a lifelong resident of Winston-Salem, NC, where he currently is a student. This is the first article of his to appear in the *Baseball Research Journal*.

The G >= .400 is the total number of games in which the cumulative season batting average at the end of a game was at or above .400. This category is like looking in the newspaper the day after each game to see what that player's batting average was season-to-date; Nap Lajoie, the one player with 100%, started the season at .750 (3-for-4) in the first game and never fell below .400.

Z-Score tells how many deviations away from the mean the batting average was for that year. The z-score formula is $(x - \mu)/\sigma$, where x is the statistic of the individual player whose z-score is being calculated, μ is the mean for the entire league, and σ is the standard deviation. Or in this case:

$$\frac{(.400\ \text{hitter's AVG}) - (\text{LgAVG})}{\text{Standard deviation of LgAVG}}$$

I used data only for players with 200+ AB in the league season, not including the player that was being evaluated. For instance, for Ted Williams' 1941 season, I used only averages from players with 200+ AB in 1941 American League, not including Williams' data. I then used the z-score to find the probability of that batting average in that particular season, using the normal density curve (the bell-shaped curve). For normal distributions (and major league batting averages are close to normal data), then 68% of all averages will be within one standard deviation of the mean, 95% within two deviations of the mean, and 99.7% within three deviations of the mean. Using a graphing calculator allows a more precise percentage to be given for z-scores that are not even numbers like one or two. When one is divided by the area under the curve, the probability of that batting average in that season results.

The "2004 Equivalence" is what the .400 batting average would translate into in "2004 average." The formula is *(z-score x Stand. Dev. Of 2004 AVG)+League AVG of 2004*. This uses the player's z-score to give us its 2004 equivalent in terms of deviations above mean. Since Standard Deviation of league averages has been going down, batting .400 is becoming increasingly difficult.

Hopefully, these splits will provide some insight into how these great seasons were compiled, so enjoy!

Table 1. Games in Which the Cumulative Season Batting Average at the End of the Game Was at or above .400

Player	Year	Tm	Lg	AB	H	AVG	G	G⩾.400(%)*
H. Duffy	1894	BOS	NL	539	237	.4397	125	68(54.4%)
T. O'Neill	1887	STL	AA	517	225	.4352	124	105(84.7%)
R. Barnes	1876	CHI	NL	322	140	.4348	66	43(65.2%)
N. Lajoie	1901	PHI	AL	544	232	.4265	131	131(100.0%)
W. Keeler	1897	BAL	NL	563	239	.4245	129	112(86.8%)
R. Hornsby	1924	STL	NL	536	227	.4235	143	112(78.3%)
T. Cobb	1911	DET	AL	590	248	.4203	146	124(84.9%)
G. Sisler	1922	STL	AL	586	246	.4198	142	140(98.6%)
T. Turner	1894	PHI	NL	347	145	.4179	82	78(95.1%)
S. Thompson	1894	PHI	NL	451	187	.4146	102	101(99.0%)
F. Dunlap	1884	STL	UA	449	185	.4120	101	99(98.0%)
E. Delahanty	1899	PHI	NL	581	238	.4096	146	137(93.8%)
J. Burkett	1896	CLE	NL	586	240	.4096	133	68(51.1%)
T. Cobb	1912	DET	AL	553	226	.4087	140	66(47.1%)
J. Jackson	1911	CLE	AL	571	233	.4081	147	51(34.7%)
G. Sisler	1920	STL	AL	631	257	.4073	154	75(48.7%)
T. Williams	1941	BOS	AL	456	185	.4057	143	112(78.3%)
J. Burkett	1895	CLE	NL	555	225	.4054	132	81(61.4%)
P. Browning	1887	LOU	AA	544	220	.4044	134	72(53.7%)
E. Delahanty	1895	PHI	NL	480	194	.4042	116	50(43.1%)
E. Delahanty	1894	PHI	NL	495	200	.4040	116	108(93.1%)
B. Hamilton	1894	PHI	NL	558	225	.4032	132	36(27.3%)
R. Hornsby	1925	STL	NL	504	203	.4028	138	64(46.4%)
H. Heilmann	1923	DET	AL	524	211	.4027	144	82(56.9%)
R. Hornsby	1922	STL	NL	623	250	.4013	154	21(13.6%)
B. Terry	1930	NYG	NL	633	254	.4013	154	79(51.3%)
H. Jennings	1896	BAL	NL	521	209	.4012	130	65(50.0%)
T. Cobb	1922	DET	AL	526	211	.4011	137	49(35.8%)

*This category is like looking in the newspaper after each game played by the .400 hitter, and tallying how many games they were at or above a .400 average for the season.

Highest Percentage of Games Finished At or Above .4000
100.0%	Lajoie	PHI	AL	1901
99.0%	Thompson	PHI	NL	1894

Most Games Finished At or Above .4000
140	Sisler	STL	AL	1922
137	Delahanty	PHI	NL	1899

Lowest Percentage of Games Finished At or Above .4000
13.6%	Hornsby	STL	NL	1922
34.7%	Jackson	CLE	AL	1911

Fewest Games Finished At or Above .4000
21	Hornsby	STL	NL	1922
49	Ty Cobb	DET	AL	1922

Interesting Facts

» Lajoie (1901) went 3-for-4 in the first game of the 1901 season and never had a season-to-date batting average below .4000 at any point; Lajoie is the only player ever to bat .4000 for "every single at-bat of the season."

Reaching .400 on the Final Game of the Season

Ed Delahanty (1895): Entering 09/30/1895, he was at .3979. He went 5-for-5 on 09/30/1895 to finish at .4042.

HughieJennings (1896): Entering 09/26/1896, he was at .3996. He went 2-for-3 on 09/26/1896 to finish at .4012.

Rogers Hornsby (1922): Entering 10/01/1922, he was at .3997. He went 3-for-5 on 10/01/1922 to finish at .4013.

Rogers Hornsby (1925): Entering 09/27/1925(2), he was at .3992. He went 3-for-3 on 09/27/1925(2) to finish at .4028.

Note: Ted Williams is not listed because his average entering his last game on 09/28/1941(2) was .4040.

No player has ever had a batting average of .4000 or higher entering the final game of the season, and ended up losing it. However, Hornsby (1921) came close:

Rogers Hornsby (1921): Entering 10/01/1921, he was at .4024. He went 0-for-4 on 10/01/1921 AND on 10/02/1921 to finish at .3970. (Note: Hornsby's average entering 10/02/1921, his final game, was .3997, so he just missed qualifying for this list).

Players who came very close to batting .400
Player	Year	Team	Lg	AB	H	AVG	How close?
Cap Anson	1881	CHI	NL	343	137	.3994	-1AB(.4006)
Lefty O'Doul	1929	PHI	NL	638	254	.3981	+1H,-1AB(.4003)
H. Heilmann	1927	DET	AL	505	201	.3980	+1H(.4000)
R. Hornsby	1921	STL	NL	592	235	.3970	+2H(.4003)
Ed Delahanty	1896	PHI	NL	499	198	.3968	+2H(.4008)
Jesse Burkett	1899	STL	NL	558	221	.3961	+2H,-1AB(.4004)
Joe Jackson	1912	CLE	AL	572	226	.3951	+3H(.4003)

Players since 1970 who batted .400 over a 162-game stretch
Player	Start	End	AB	H	2B	3B	HR	BA
Tony Gwynn	7-27-93	5-13-95	624	251	53	1	15	.402
Wade Boggs	6-09-85	6-06-86	641	257	50	2	12	.401

Table 2. Batting Average at Home and Away Parks

Player	Year	Team	Lg	AB	H	BA	G	Home (H-AB)	Away (H-AB)
Hugh Duffy	1894	BOS	NL	539	237	.4397	125	.4480(112-250)	.4325(125-289)
Tip O'Neill	1887	STL	AA	517	225	.4352	124	.4794(128-267)	.3880(97-250)
Ross Barnes	1876	CHI	NL	322	140	.4348	66	.4465(71-159)	.4233(69-163)
Nap Lajoie	1901	PHI	AL	544	232	.4265	131	.4196(107-255)	.4325(125-289)
Willie Keeler	1897	BAL	NL	563	239	.4245	129	.4373(122-279)	.4120(117-284)
Rogers Hornsby	1924	STL	NL	536	227	.4235	143	.4690(136-290)	.3699(91-246)
Ty Cobb	1911	DET	AL	590	248	.4203	146	.4175(124-297)	.4232(124-293)
George Sisler	1922	STL	AL	586	246	.4198	142	.4492(115-256)	.3970(131-330)
Tuck Turner	1894	PHI	NL	347	145	.4179	82	.4010(83-207)	.4429(62-140)
Sam Thompson	1894	PHI	NL	451	187	.4146	102	.4439(99-223)	.3860(88-228)
Fred Dunlap	1884	STL	UA	449	185	.4120	101	.4316(101-234)	.3907(84-215)
Ed Delahanty	1899	PHI	NL	581	238	.4096	146	.4583(143-312)	.3532(95-269)
Jesse Burkett	1896	CLE	NL	586	240	.4096	133	.4565(126-276)	.3677(114-310)
Ty Cobb	1912	DET	AL	553	226	.4087	140	.4036(113-280)	.4139(113-273)
Joe Jackson	1911	CLE	AL	571	233	.4081	147	.4065(113-278)	.4096(120-293)
George Sisler	1920	STL	AL	631	257	.4073	154	.4732(150-317)	.3408(107-314)
Ted Williams	1941	BOS	AL	456	185	.4057	143	.4280(104-243)	.3803(81-213)
Jesse Burkett	1895	CLE	NL	555	225	.4054	132	.4160(104-250)	.3967(121-305)
Pete Browning	1887	LOU	AA	544	220	.4044	134	.4203(116-276)	.3881(104-268)
Ed Delahanty	1895	PHI	NL	480	194	.4042	116	.4286(129-301)	.3631(65-179)
Ed Delahanty	1894	PHI	NL	495	200	.4040	116	.4750(114-240)	.3373(86-255)
Billy Hamilton	1894	PHI	NL	558	225	.4032	132	.4416(136-308)	.3560(89-250)
Rogers Hornsby	1925	STL	NL	504	203	.4028	138	.4776(117-245)	.3320(86-259)
Harry Heilmann	1923	DET	AL	524	211	.4027	144	.4016(100-249)	.4036(111-275)
Rogers Hornsby	1922	STL	NL	623	250	.4013	154	.4026(126-313)	.4000(124-310)
Bill Terry	1930	NYG	NL	633	254	.4013	154	.4013(124-309)	.4012(130-324)
Hughie Jennings	1896	BAL	NL	521	209	.4012	130	.4348(110-253)	.3694(99-268)
Ty Cobb	1922	DET	AL	526	211	.4011	137	.4044(110-272)	.3976(101-254)

Highest Batting Average (Home)

.4794	O'Neill	STL	AA	1887	(128-267)
.4776	Hornsby	STL	NL	1925	(117-245)
.4732	Sisler	STL	AL	1920	(150-317)

Highest Batting Average (Away)

.4429	Turner	PHI	NL	1894	(62-140)
.4325	Lajoie	PHI	AL	1901	(125-289)

Lowest Batting Average (Home)

.4010	Turner	PHI	NL	1894	(83-207)
.4016	Heilmann	DET	AL	1923	(100-249)

Lowest Batting Average (Away)

.3320	Hornsby	STL	NL	1925	(86-259)
.3408	Sisler	STL	AL	1920	(107-314)

Most Hits (Home)

150	Sisler	STL	AL	1920	(78 games)
143	Delahanty	PHI	NL	1899	(77 games)

Most Hits (Away)

131	Sisler	STL	AL	1922	(77 games)
130	Terry	NYG	NL	1930	(77 games)

Interesting Facts

» All players batted at or above .4000 in their home parks.

» Only 11 of 28 players batted at or above .4000 in road parks.

» Four of the five highest home batting averages were in St. Louis ballparks.

» Turner (1894) holds the records for highest road BA (.4429) *and* the lowest home BA (.4010) in the same season.

» Hornsby (1925) holds the NL records for highest home BA (.4776) *and* the lowest road BA (.3320) in the same season.

» Sisler (1920) holds the AL records for highest home BA (.4732) *and* the lowest road BA (.3408) in the same season.

Table 3. Batting Average by Calendar Month

Player	Year	Tm	Lg	AB	H	BA	G	Apr. (H-AB)	May (H-AB)	June (H-AB)	July (H-AB)	Aug. (H-AB)	Sept. (H-AB)	Oct. (H-AB)
Hugh Duffy	1894	BOS	NL	539	237	.4397	125	.3235 (11-34)	.3299 (32-97)	.4706 (56-119)	.5000 (57-114)	.5063 (40-79)	.4271 (41-96)	--
Tip O'Neill	1887	STL	AA	517	225	.4352	124	.4468 (21-47)	.5690 (33-58)	.3494 (29-83)	.2889 (26-90)	.5179 (58-112)	.4535 (39-86)	.4634 (19-41)
Ross Barnes	1876	CHI	NL	322	140	.4348	66	.2500 (3-12)	.3571 (20-56)	.5522 (37-67)	.5000 (35-70)	.3750 (21-56)	.3934 (24-61)	--
Nap Lajoie	1901	PHI	AL	544	232	.4265	131	.7500 (12-16)	.4200 (42-100)	.3654 (38-104)	.4660 (48-103)	.4259 (46-108)	.4071 (46-113)	--
Willie Keeler	1897	BAL	NL	563	239	.4245	129	.5143 (18-35)	.3898 (46-118)	.3889 (28-72)	.4000 (44-110)	.3826 (44-115)	.5221 (59-113)	--
Rogers Hornsby	1924	STL	NL	536	227	.4235	143	.4286 (24-56)	.3889 (35-90)	.3663 (37-101)	.4643 (52-112)	.5094 (54-106)	.3521 (25-71)	--
Ty Cobb	1911	DET	AL	599	248	.4203	146	.3793 (22-58)	.4286 (48-112)	.5806 (48-96)	.3874 (43-111)	.3958 (38-96)	.4299 (46-107)	.3000 (3-10)
George Sisler	1922	STL	AL	585	246	.4198	142	.4375 (28-64)	.4174 (48-115)	.4561 (52-114)	.3265 (32-98)	.4513 (51-113)	.4304 (34-79)	.3333 (1-3)
Tuck Turner	1894	PHI	NL	347	145	.4179	82	.5833 (7-12)	.4237 (25-59)	.3564 (36-101)	.5283 (28-53)	.3443 (21-61)	.4590 (28-61)	--
Sam Thompson	1894	PHI	NL	451	187	.4146	102	.5405 (20-37)	.3548 (11-31)	.4231 (11-26)	.3846 (45-117)	.4403 (59-134)	.3868 (41-106)	--
Fred Dunlap	1884	STL	UA	449	185	.4120	101	.5000 (12-24)	.4353 (37-85)	.3944 (28-71)	.4085 (29-71)	.4138 (36-87)	.4265 (29-68)	.3256 (14-43)
Ed Delahanty	1899	PHI	NL	581	238	.4096	146	.4355 (27-62)	.3906 (25-64)	.3826 (34-89)	.4312 (47-109)	.3761 (44-117)	.4314 (44-102)	.4474 (17-38)
Jesse Burkett	1896	CLE	NL	585	240	.4096	133	.3158 (12-38)	.4038 (42-104)	.5143 (54-105)	.3333 (46-138)	.3558 (37-104)	.5052 (49-97)	--
Ty Cobb	1912	DET	AL	553	226	.4087	140	.2885 (15-52)	.4304 (34-79)	.3571 (40-112)	.5276 (67-127)	.3626 (33-91)	.3929 (33-84)	.5000 (4-8)
Joe Jackson	1911	CLE	AL	571	233	.4081	147	.3607 (22-61)	.4141 (41-99)	.3407 (31-91)	.4393 (47-107)	.4681 (44-94)	.3962 (42-106)	.4615 (6-13)
George Sisler	1920	STL	AL	631	257	.4073	154	.3333 (12-36)	.3545 (39-110)	.5263 (60-114)	.3252 (40-123)	.4000 (42-105)	.4419 (57-129)	.5000 (7-14)
Ted Williams	1941	BOS	AL	455	185	.4057	143	.3889 (7-18)	.4356 (44-101)	.3723 (35-94)	.4286 (27-63)	.4019 (43-107)	.3973 (29-73)	--
Jesse Burkett	1895	CLE	NL	555	225	.4054	132	.4872 (19-39)	.4592 (45-98)	.3495 (36-103)	.3440 (43-125)	.4206 (45-107)	.4458 (37-83)	--
Pete Browning	1887	LOU	AA	544	220	.4042	134	.3333 (13-39)	.4375 (42-96)	.4302 (37-86)	.3438 (33-96)	.4074 (44-108)	.4382 (39-89)	.4000 (12-30)
Ed Delahanty	1895	PHI	NL	480	194	.4042	116	.4286 (9-21)	.3958 (38-96)	.4658 (32-69)	.2877 (21-73)	.3853 (42-109)	.4643 (52-112)	--
Ed Delahanty	1894	PHI	NL	495	200	.4040	116	.3571 (10-28)	.4824 (41-85)	.4175 (43-103)	.4359 (51-117)	.4405 (37-84)	.2308 (18-78)	--
Billy Hamilton	1894	PHI	NL	558	225	.4032	132	.2619 (11-42)	.3797 (30-79)	.3789 (36-95)	.3945 (43-109)	.5154 (67-130)	.3689 (38-103)	--
Rogers Hornsby	1925	STL	NL	504	203	.4028	138	.4324 (16-37)	.3571 (35-98)	.4800 (48-100)	.3258 (29-89)	.3679 (39-106)	.4865 (36-74)	--
Harry Heilmann	1923	DET	AL	524	211	.4027	144	.5306 (26-49)	.3467 (26-75)	.4419 (38-86)	.3238 (34-105)	.4070 (35-86)	.4103 (48-117)	.6667 (4-6)
Rogers Hornsby	1922	STL	NL	623	250	.4013	154	.3889 (21-54)	.3714 (39-105)	.4271 (41-96)	.3830 (54-141)	.3804 (35-92)	.4385 (57-130)	.6000 (3-5)
Bill Terry	1930	NYG	NL	633	254	.4013	154	.3902 (16-41)	.3902 (48-123)	.3824 (39-102)	.4118 (56-136)	.4397 (51-116)	.3826 (44-115)	--
H. Jennings	1896	BAL	NL	521	209	.4012	130	.4048 (17-42)	.3846 (40-104)	.4337 (36-83)	.3478 (40-115)	.4381 (46-105)	.4167 (30-72)	--
Ty Cobb	1922	DET	AL	526	211	.4011	137	.0833 (1-12)	.4151 (44-106)	.3523 (31-88)	.4891 (67-137)	.3578 (39-109)	.3836 (28-73)	1.000 (1-1)

Months at or above .5000 (minimum 25 Hits)

PLAYER	MONTH	YEAR	TEAM	LG	AB	H	AVG
Tip O'Neill	May	1887	STL	AA	58	33	.5690
Ross Barnes	June	1876	CHI	NL	67	37	.5522
Harry Heilmann	April	1923	DET	AL	49	26	.5306
Tuck Turner	July	1894	PHI	NL	53	28	.5283
Ty Cobb	July	1912	DET	AL	127	67	.5276
George Sisler	June	1920	STL	AL	114	60	.5263
Willie Keeler	Sept.	1897	BAL	NL	113	59	.5221
Tip O'Neill	Aug.	1887	STL	AA	112	58	.5179
Billy Hamilton	Aug.	1894	PHI	NL	130	67	.5154
Jesse Burkett	June	1896	CLE	NL	105	54	.5143
Rogers Hornsby	Aug.	1924	STL	NL	106	54	.5094
Hugh Duffy	Aug.	1894	BOS	NL	79	40	.5063
Jesse Burkett	Sept.	1896	CLE	NL	97	49	.5052
Ross Barnes	July	1876	CHI	NL	70	35	.5000
Hugh Duffy	July	1894	BOS	NL	114	57	.5000
Ty Cobb	June	1911	DET	AL	96	48	.5000

Months of 56 or more Hits

PLAYER	MONTH	YEAR	TEAM	LG	H
Billy Hamilton	Aug	1894	PHI	NL	67
Ty Cobb	July	1912	DET	AL	67
Ty Cobb	July	1922	DET	AL	67
George Sisler	June	1920	STL	AL	60
Sam Thompson	Aug	1894	PHI	NL	59
Willie Keeler	Sept	1897	BAL	NL	59
Tip O'Neill	Aug	1887	STL	AA	58
Hugh Duffy	July	1894	BOS	NL	57
George Sisler	Sept	1920	STL	AL	57
Rogers Hornsby	Sept	1922	STL	NL	57
Hugh Duffy	June	1894	BOS	NL	56
Bill Terry	July	1930	NYG	NL	56

Months at or below .3000 (minimum 20 AB)

PLAYER	MONTH	YEAR	TEAM	LG	AB	H	AVG
Ed Delahanty	Sept.	1894	PHI	NL	78	18	.2308
Billy Hamilton	April	1894	PHI	NL	42	11	.2619
Ed Delahanty	July	1895	PHI	NL	73	21	.2877
Ty Cobb	April	1912	DET	AL	52	15	.2885

Z-Scores, probabilities, and 2004 equivalents

Player	Year	Team	Lg	AB	H	AVG	G	z-Score[a]	Prob.[b]	2004 Eq.[c]
Hugh Duffy	1894	BOS	NL	539	237	.4397	125	2.8652	480	.3606
Tip O'Neill	1887	STL	AA	517	225	.4352	124	3.6139	6629	.3825
Ross Barnes	1876	CHI	NL	322	140	.4348	66	3.5082	4074	.3787*
Nap Lajoie	1901	PHI	AL	544	232	.4265	131	4.2914	112567	.4023
Willie Keeler	1897	BAL	NL	563	239	.4245	129	2.9950	729	.3644
Rogers Hornsby	1924	STL	NL	536	227	.4235	143	4.1866	59511	.3981
Ty Cobb	1911	DET	AL	590	248	.4203	146	3.1288	1139	.3683
George Sisler	1922	STL	AL	586	246	.4198	142	3.5311	4832	.3801
Tuck Turner	1894	PHI	NL	347	145	.4179	82	2.3090	95	.3443
Sam Thompson	1894	PHI	NL	451	187	.4146	102	2.2284	77	.3419
Fred Dunlap	1884	STL	UA	449	185	.4120	101	2.7852	374	.3582†
Ed Delahanty	1899	PHI	NL	581	238	.4096	146	3.1548	1245	.3690
Jesse Burkett	1896	CLE	NL	586	240	.4096	133	2.7645	351	.3576
Ty Cobb	1912	DET	AL	553	226	.4087	140	3.3368	2360	.3744
Joe Jackson	1911	CLE	AL	571	233	.4081	147	2.8027	395	.3587
George Sisler	1920	STL	AL	631	257	.4073	154	2.7541	340	.3573
Ted Williams	1941	BOS	AL	456	185	.4057	143	3.8984	20647	.3908
Jesse Burkett	1895	CLE	NL	555	225	.4054	132	2.2914	91	.3438
Pete Browning	1887	LOU	AA	544	220	.4044	134	2.8097	403	.3589
Ed Delahanty	1895	PHI	NL	480	194	.4042	116	2.2521	82	.3426
Ed Delahanty	1894	PHI	NL	495	200	.4040	116	1.9882	43	.3349
Billy Hamilton	1894	PHI	NL	558	225	.4032	132	1.9691	41	.3343
Rogers Hornsby	1925	STL	NL	504	203	.4028	138	3.2080	1496	.3706
Harry Heilmann	1923	DET	AL	524	211	.4027	144	2.9347	599	.3626
Rogers Hornsby	1922	STL	NL	623	250	.4013	154	2.9960	731	.3644
Bill Terry	1930	NYG	NL	633	254	.4013	154	2.2718	87	.3432
Hughie Jennings	1896	BAL	NL	521	209	.4012	130	2.5231	172	.3506
Ty Cobb	1922	DET	AL	526	211	.4011	137	2.9202	571	.3622

*(100 AB min. used for S and mean)   †(150 AB min. used for S and mean)

Standard deviation, standard deviations from mean, and mean do not include players with <200 AB in the given league season (except for Barnes 1876 and Dunlap 1884) or the player stats of those evaluated.

[a]z=Standard Deviations from mean (omitting the stats of the player evaluated, and any player with <200 AB in a season in both mean and S to avoid giving low AB seasons too much influence and to allow the batting averages to better reflect the general batting of the league season)

[b]Probability of that average with at least 200 AB in that league season based on z-score. (1/(Area to the right on the normal density curve for Z deviations above mean))

[c]The batter's 2004 equivalent of batting average using (player's z * stdeviation of 2004 batting) + (mean batting average for all players with 200+ AB in 2004).

10 highest averages since 1941

Player	Year	Team	Lg	AB	H	AVG	G	z-Score[a]	Prob.[b]	2004 Eq.[c]
Tony Gwynn	1994	SD	NL	419	165	.3938	110	3.6905	8932	.3847
George Brett	1980	KC	AL	449	175	.3898	117	3.7931	13440	.3877
Ted Williams	1957	BOS	AL	420	163	.3881	132	4.0897	46276	.3964
Rod Carew	1977	MIN	AL	616	239	.3880	155	3.9092	21590	.3911
Larry Walker	1999	COL	NL	438	166	.3790	127	3.1184	1100	.3680
Stan Musial	1948	STL	NL	611	230	.3764	155	3.3902	2864	.3759
Todd Helton	2000	COL	NL	580	216	.3724	160	2.9176	567	.3621
N.Garciaparra	2000	BOS	AL	529	197	.3724	140	3.0355	833	.3656
Ichiro Suzuki	2004	SEA	AL	704	262	.3722	161	3.2444	1699	.3717
Tony Gwynn	1997	SD	NL	592	220	.3716	149	3.5220	4669	.3798
A. Galarraga	1993	COL	NL	470	174	.3702	120	3.2616	1805	.3722

Some recent league-leading BAs

Player	Year	Team	Lg	AB	H	AVG	G	z-Score[a]	Prob.[b]	2004 Eq.[c]
Barry Bonds	2002	SF	NL	403	149	.3697	143	3.6024	6342	.3821
Manny Ramirez	2002	BOS	AL	436	152	.3486	120	2.6224	229	.3535
Albert Pujols	2003	STL	NL	591	212	.3587	157	2.8152	410	.3591
Bill Mueller	2003	BOS	AL	524	171	.3263	146	1.9139	36	.3327
Ichiro Suzuki	2004	SEA	AL	704	262	.3722	161	3.2444	1699	.3717
Barry Bonds	2004	SF	NL	373	135	.3619	147	3.2531	1752	.3719

2004 equivalence is not the same as real AVG because only the league of the batter was used to determine the player's z-score, while both NL and AL data were used to get the 2004 league standard deviation and mean average.

Interesting Facts

» Approximate odds of hitting .400 in 2004: z-score of 4.212 (or 1 in 79000)

» Approximate odds of hitting .400 in 1894: z-score of 1.852 (or 1 in 31.2)

» Batting .400 in 2004 would have been approximately equivalent to batting .505 in 1894. Nap Lajoie in 1901 is the only .400 hitter whose z-score would have resulted in a .400 or greater average in 2004.

Games with a certain amount of hits in the season

Player	Year	Team	Lg	AB	H	AVG	G	1+H(%G)	2+H(%G)	3+H(%G)	4+H(%G)	5+H(%G)
Hugh Duffy	1894	BOS	NL	539	237	.4397	125	106 (84.8%)	82 (65.6%)	34 (27.2%)	13 (10.4%)	2 (1.6%)
Tip O'Neill	1887	STL	AA	517	225	.4352	124	103 (83.1%)	70 (56.5%)	34 (27.4%)	14 (11.3%)	4 (3.2%)
Ross Barnes	1876	CHI	NL	322	140	.4348	66	57 (86.4%)	46 (69.7%)	25 (37.9%)	9 (13.6%)	2 (3.0%)
Nap Lajoie	1901	PHI	AL	544	232	.4265	131	114 (87.0%)	76 (58.0%)	33 (25.2%)	8 (6.1%)	0 (0.0%)
Willie Keeler	1897	BAL	NL	563	239	.4245	129	117 (90.7%)	82 (63.6%)	27 (20.9%)	11 (8.5%)	2 (1.6%)
Rogers Hornsby	1924	STL	NL	536	227	.4235	143	119 (83.2%)	75 (52.4%)	29 (20.3%)	4 (2.8%)	0 (0.0%)
Ty Cobb	1911	DET	AL	590	248	.4203	146	129 (88.4%)	84 (57.5%)	29 (19.9%)	5 (3.4%)	1 (0.7%)
George Sisler	1922	STL	AL	586	246	.4198	142	126 (88.7%)	72 (50.7%)	36 (25.4%)	12 (8.5%)	0 (0.0%)
Tuck Turner	1894	PHI	NL	347	145	.4179	82	68 (82.9%)	48 (58.5%)	24 (29.3%)	5 (6.1%)	0 (0.0%)
Sam Thompson	1894	PHI	NL	451	187	.4146	102	89 (87.3%)	58 (56.9%)	27 (26.5%)	9 (8.8%)	3 (2.9%)
Fred Dunlap	1884	STL	UA	449	185	.4120	101	87 (86.1%)	61 (60.4%)	24 (23.8%)	11 (10.9%)	2 (2.0%)
Ed Delahanty	1899	PHI	NL	581	238	.4096	146	125 (85.6%)	75 (51.4%)	30 (20.5%)	6 (4.1%)	2 (1.4%)
Jesse Burkett	1896	CLE	NL	586	240	.4096	133	115 (86.5%)	75 (56.4%)	34 (25.6%)	13 (9.8%)	3 (2.3%)
Ty Cobb	1912	DET	AL	553	226	.4087	140	119 (85.0%)	76 (54.3%)	25 (17.9%)	5 (3.6%)	1 (0.7%)
Joe Jackson	1911	CLE	AL	571	233	.4081	147	127 (86.4%)	76 (51.7%)	26 (17.7%)	4 (2.7%)	0 (0.0%)
George Sisler	1920	STL	AL	631	257	.4073	154	130 (84.4%)	74 (48.1%)	41 (26.6%)	12 (7.8%)	0 (0.0%)
Ted Williams	1941	BOS	AL	456	185	.4057	143	113 (79.0%)	50 (35.0%)	18 (12.6%)	4 (2.8%)	0 (0.0%)
Jesse Burkett	1895	CLE	NL	555	225	.4054	132	110 (83.3%)	73 (55.3%)	36 (27.3%)	5 (3.8%)	1 (0.8%)
Pete Browning	1887	LOU	AA	544	220	.4044	134	117 (87.3%)	71 (53.0%)	25 (18.7%)	6 (4.5%)	1 (0.7%)
Ed Delahanty	1895	PHI	NL	480	194	.4042	116	94 (81.0%)	61 (52.6%)	26 (22.4%)	11 (9.5%)	2 (1.7%)
Ed Delahanty	1894	PHI	NL	495	200	.4040	116	92 (79.3%)	64 (55.2%)	31 (26.7%)	10 (8.6%)	2 (1.7%)
B. Hamilton	1894	PHI	NL	558	225	.4032	132	112 (84.8%)	73 (55.3%)	27 (20.5%)	11 (8.3%)	2 (1.5%)
Rogers Hornsby	1925	STL	NL	504	203	.4028	138	111 (80.4%)	65 (47.1%)	22 (15.9%)	5 (3.6%)	0 (0.0%)
H. Heilmann	1923	DET	AL	524	211	.4027	144	123 (85.4%)	63 (43.8%)	21 (14.6%)	3 (2.1%)	1 (0.7%)
Rogers Hornsby	1922	STL	NL	623	250	.4013	150	135 (87.7%)	78 (50.6%)	32 (20.8%)	5 (3.2%)	0 (0.0%)
Bill Terry	1930	NYG	NL	633	254	.4013	154	129 (83.8%)	80 (51.9%)	32 (20.8%)	11 (7.1%)	2 (1.3%)
H. Jennings	1896	BAL	NL	521	209	.4012	130	106 (81.5%)	67 (51.5%)	29 (22.3%)	6 (4.6%)	1 (0.8%)
Ty Cobb	1922	DET	AL	526	211	.4011	137	111 (81.0%)	67 (48.9%)	21 (15.3%)	8 (5.8%)	4 (2.9%)

Leaders, hits per game (HPG)

One or more HPG
Most often: Keeler had 1 or more hits in 117 of 129 games in 1897 for 90.7%, the only player above 90.0%.
Most times: Hornsby had the most games with 1 or more hits with 135 in 1922 (out of 150 games for 87.7%).

Two or more HPG
Most often: Barnes had 2 or more hits in 46 of 66 games in 1876 for 69.7%, one of only 3 players with 2 or more hits in >60.0% of their games.
Most times: Cobb had the most games with 2 or more hits with 84 in 1911 (out of 146 games for 57.5%).

Three or more HPG
Most often: Barnes had 3 or more hits in 25 of 66 games in 1876 for 37.9%, the only player above 30.0%.
Most times: Sisler had the most games with 3 or more hits with 41 in 1920 (out of 154 games for 26.6%).

Four or more HPG
Most often: Barnes had 4 or more hits in 9 of 66 games in 1876 for 13.6%, one of only 4 players with 4 or more hits in >10.0% of their games.
Most times: O'Neill had the most games with 4 or more hits with 14 in 1887 (out of 124 games for 11.3%).

Five or more HPG
Most often: O'Neill had 5 or more hits in 4 of 124 games in 1887 for 3.2%, one of only 5 players with 5 or more hits in >2.0% of their games.
Most times: O'Neill and Cobb had the most games with 4 or more hits with 4 each O'Neill had 5 or more hits 4 times in 1887 (out of 124 games for 3.2%). Cobb had 5 or more hits 4 times in 1922 (out of 137 games for 2.9%).

WHY SOME NUMBERS ARE DIFFERENT

Ross Barnes, 1876

Since no game-by-game logs have ever been made in any form for NL players pre-1891, I had to use newspapers to put together Barnes's splits. I used the *New York Clipper* for the majority of games, but also used the *Chicago Tribune* for about 40% of Barnes's data. Using newspapers, I came up with two more hits for Barnes than what most encyclopedias list.

Pete Browning, 1887

In 1887, walks were counted as 1-for-1 in box scores. On August 31, 1887, Pete Browning went 4-for-7 by 1887 standards, but 3 of those were walks. Thus, Browning went 1-for-4 by today's standards. When ICI (Information Concepts, Incorporated) made their game logs, they put Browning down as 1-for-7 with 3 walks. ICI clearly forgot to subtract the 3 walks from his at-bat total, as they did subtract 3 from his hit total. Browning should be listed as 1-for-4 with 3 walks by today's standards, not 1-for-7 with 3 walks, which ICI used (which incorrectly used the 1887 definition for at-bats, but the current definition for hits). If ICI were correct, then this would mean Browning came up to bat 10 times in a 9-inning game, 2 more times than the known record. While there are probably many errors like this, this one gave Browning 3 more at-bats than he really had, and this error is a pretty obvious one.

Willie Keeler, 1897

The change for Keeler's 1897 season is one fewer at-bat. I found this one while investigating Keeler's 5-hit games in 1897. *The Sporting News's Complete Baseball Record Book* lists Keeler with four 5-hit games in 1897, but the ICI logs made in 1968 and 1969 have Keeler with only two 5-hit games. One of the games listed by TSN but not ICI was on September 3, 1897. Most newspapers list Keeler as going 6-for-6 with no walks. However, data collected by Pete Palmer shows Keeler as 4-for-5 with a hit-by-pitch:

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PA1)  Single,Stolen Base, Run Scored (1st inning)
PA2)  Reached  on  E6,  Stolen  Base,  Run  Scored  (2nd
      inning)
PA3)  Triple, Run Scored (3rd inning)
PA4)  Hit-By-Pitch,Stolen Base, Run Scored (4th inning)
PA5)  Single (6th inning)
PA6)  Single, Run Scored (8th inning)

TOTALS--5 AB, 5 R, 4 H, 1 HBP
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Since ICI lists Keeler as going 4-for-6, Keeler clearly should have one fewer at-bat than currently listed with. All sources agree that Keeler was HBP, and, using the number of total team plate appearances, it is impossible Keeler could have batted 7 times (6 AB and 1 HBP). Therefore, I have Keeler with 563 AB instead of his listed 564.

Ty Cobb, 1911

Most encyclopedias list Cobb with 248 hits in 591 at-bats for 1911. While inputting Cobb's 1911 data from his official AL game logs into a database, I found that Cobb was really credited with 590 AB if the individual game totals were added up. However, the aggregate total listed at the end of Cobb's sheet was the number used, which was incorrectly put as 591 at-bats. Since the totals were summed by hand, the likelihood of errors made for these early years is high; this mistake in addition means that Cobb should be credited with 1 fewer at-bat for 1911.

Tuck Turner, Sam Thompson,
Ed Delahanty, Billy Hamilton (1894)
and Jesse Burkett (1895)

These players all played in at least one protested game in the year listed. These games' stats were counted by the National League office in the 1890s (except for wins and losses), but when ICI recalculated all stats from these years in the late 1960s, they incorrectly omitted the protested games' stats in their totals. Using box scores, the totals have been updated to what they should have been. Here are dates and stats for each of these protested games; these stats have been added to the formerly listed totals for each of these players (these changes are shown in *Total Baseball* (8th ed.) and *The Baseball Encyclopedia* (2004):

Saving Face: Reconsidering Relief Pitching

As baseball grew over its first half-century and the manner in which it is played has evolved, new statistics have appeared and vanished. But only one statistic, barely two generations old, has single-handedly altered the way the game is managed, influences the spending of millions of dollars, and determines the roles to be played by almost a quarter of a team's roster. It is the only major statistic to have been introduced since the end of the Deadball Era. It is also an extremely poor yardstick of the very performance it is intended to measure: the save.

In this paper I will discuss the origin of the save rule, chronicle how the save is unique among statistics in how it dictates strategy, and explore how it unfairly rewards some relievers while leaving the majority in obscurity. I will present a new system that evaluates middle relievers and closers on the same scale and also does not credit pitchers for saving a game that is not in any jeopardy in the first place. I evaluated relief pitching in the 2004 season and applied this system to every post-season relief appearance—from the first by Bucky Veil in 1903 to the last by Keith Foulke in 2004.

The data was collected by analyzing the individual game situations for each of the 2,428 regular-season games in 2004 and for each of the 4,233 all-time post-season relief appearances. Data sources included the web sites of ESPN (which contained a surprisingly high number of errors and inaccuracies), Fox Sports, CNN, Yahoo!, NewsOK.com, and Retrosheet.

ORIGIN OF THE SAVE

The idea for a statistic called a "save," specifically intended for relief pitching, began in 1952. Three National League executives began unofficially awarding a save to any pitcher that finished a winning game and was not the winning pitcher, regardless of the score.

The first formula for the save was written by the legendary sportswriter Jerome Holtzman as he sat on the Chicago Cubs' team bus outside St. Louis's Chase Hotel in 1960. Holtzman

JIM POSERINA is a web developer and technical writer living in South Plainfield, New Jersey, trying to survive as a Mets fan during a Yankee dynasty. With Robert Kissell, he operates kpozsports.com, a sports team ranking model.

wanted a way to credit Cub relievers Don Elson and Bill Hendry, who were routinely protecting late-inning leads in statistical obscurity. Holtzman showed his formula to Cubs manager Lou Boudreau, who thought it a good idea, as did J. G. Taylor Spink, editor and publisher of *The Sporting News* and future namesake of the Hall of Fame's award for baseball writers. Spink began publishing the unofficial stat and awarding an annual trophy to the top reliever in each league.

After a decade of lobbying by the Baseball Writers Association of America, the Scoring Rules Committee formally adopted the save in 1969, with a few minor changes from Holtzman's original formula. This was the era of the four-man rotation, where the complete game was the exception rather than the rule.

The save is defined as follows in Rule 10.20:

Credit a pitcher with a save when he meets all three of the following conditions:
  (1) He is the finishing pitcher in a game won by his club; and
  (2) He is not the winning pitcher; and
  (3) He qualifies under one of the following conditions:
      a. He enters the game with a lead of no more than three runs and pitches for at least one inning; or
      b. He enters the game, regardless of the count, with the potential tying run either on base, or at bat, or on deck (that is, the potential tying run is either already on base or is one of the first two batsmen he faces); or
      c. He pitches effectively for at least three innings. No more than one save may be credited in each game.

RELIEVERS TODAY

The save is quickly becoming as ridiculous as measuring batting performance based solely on the number of plate appearances. Today, a manager is expected to designate a closer and use him in one of the save opportunity situations, typically that mentioned in condition 3(a). This is so that the closer can accumulate saves during the course of the season and point to that total when it is time to renew his contract. There is also a sort of baseball urban legend about managers receiving angry calls

from their closers' agents the morning after a different reliever was summoned from the bullpen in a save situation.

Because of this phenomenon, managers tend to put some of their bullpen decisions on autopilot because the ninth inning is made the exclusive dominion of the closer. It doesn't matter if the team is in a jam in the seventh inning; the closer can't come in because the manager has to save him for the ninth. It scarcely enters into the decision that if the team doesn't survive the seventh-inning crisis, the ninth may well not even be a save situation at all.

Another nickname for the closer is the fireman, one who comes in during an er 'gency to extinguish a fire. Because of how this statistic has altered the conventional wisdom, the designated closer may rarely be the fireman any longer.

Consider the following situations, in each of which a call is made to the bullpen:

1. The Yankees are leading the Giants 4-3 in the bottom of the eighth inning. San Francisco has just loaded the b ses on two singles and a walk, and Barry Bonds is at the plate with nobody out.
2. The Cubs and Cardinals are tied 5-5 in the bottom of the eleventh inning. St. Louis is threatening with nobody out, runners on second and third, and Albert Pujols due up.
3. The Dodgers are leading the Brewers 4-1 in the top of the ninth inning, and three September call-ups are due up for Milwaukee.

In the first scenario, a Barry Bonds grand slam would put the Yankees in a three-run hole. In the second, anything from a passed ball to a sacrifice fly would end the game. In the third, Los Angeles could give up two runs and still win the game. Now assume that each pitcher called in from the bullpen strikes out every batter he faces, and is lifted for a pinch-hitter in the following inning if necessary. Which pitchers will get a save, and which pitchers actually saved the game?

The influence of the save on bullpen usage reaches its most absurd level in extra-inning games on the road. Assume a tie game in the bottom of the tenth inning: One false move by the visiting reliever would immediately end the game. Say the reliever gets out of the tenth inning unscathed, and his team scores three runs in the top of the eleventh. When the closer enters the game in the bottom of the inning, he has a three-run margin of error, meaning that he could allow two upper-deck home runs and his team would still come away with the W. The ace reliever did not enter the game until his team had the lead, while a less effective and more inexperienced pitcher was summoned from the bullpen with no margin for error. To

an uninformed observer this would seem counterintuitive, but under Rule 10.20, the tenth inning is not a save situation and the eleventh inning is.

Intuition, or at least common sense, should tell the manager that his best relief pitcher should come into the game in the tenth inning where there is no margin for error, and to save his less effective reliever for the eleventh inning and its two-run safety net. But this intuitive reasoning is ignored by followers of the Cult of the Save, and often with disastrous results, as Alex Gonzalez showed the Yankees in Game Four of the 2003 World Series. Shaky Jeff Weaver (5.99 ERA, 5.25 K/9IP, .320 BAA) was handed the ball in a do-or-die situation while the near-automatic Mariano Rivera (1.66, 8.02, .235) sat in the bullpen because it was not a save situation, and the rest is history.

More games are won or lost in eighth inning than in the ninth, and the same is true for the seventh. Yet no pitcher that leaves a regulation game while it is still going on can be credited with a save, regardless of when the game was actually "saved," if it was at all. For a game so intertwined with numbers, there are no prominent statistics at all for the workhorses of the team, especially since starting pitchers of recent vintage are leaving the game so much earlier: the middle relievers.

In an attempt to somehow remedy this, some media organizations have been tracking an unofficial statistic on their web sites called the hold. This goes part of the way toward creating an honest assessment of the roles of all relief pitchers, but it is still leaves a clunky system very much in place. A pitcher can enter a three-run game with two outs and nobody on, walk five batters in a row, leave the game with his bases-loaded mess for the next pitcher to clean up, and receive credit for a hold.

It was only a handful of years ago that baseball even started officially charging pitchers with blown saves. The relievers' post-season honor, the Rolaids Relief Man Award, now includes in its formula a one-point bonus for a "tough save," defined as one in which the closer entered the game with the tying run already on base. But what is the counterpart of the tough save, the "easy save"? And is an easy save a game that was really "saved" in the first place? Apparently not, since less than eight percent of saves during the 2004 season were considered tough saves.

21ST-CENTURY STATISTICS FOR 21ST-CENTURY BULLPENS

After watching relievers like Eric Gagne and Mariano Rivera pile on save after save for closing out games that really didn't need rescuing, while uncelebrated middle relievers were stuck with the real dirty work, it became clear to me that modern bullpens had long outgrown the simple, misleading statistic of almost two generations ago. The save just wasn't doing the job any-

more, and the longer it continued, the more late-inning disasters would occur as the team's best reliever sat in the bullpen waiting for the ninth inning to come around, and the higher the dollars-to-innings-pitched ratio of the chosen few would climb.

My aim was to devise statistics that are invoked only in situations where there is an immediate potential crisis. Just as the word "relieve" means "to free from distress" and "to rescue from a siege," I considered situations wherein the incoming pitcher would not only save the game, but save the exiting pitcher.

The statistics that I have created are the Saved Lead, Blown Lead, Saved Game, and Blown Game.

One drawback is that at first glance, this new system isn't as simple as the existing rule insofar as determining what constitutes a save situation. From the standpoint of effectively measuring and ranking all relief pitchers together with one formula, one advantage is that the new system isn't as simple as the existing rule. While this system looks much more complicated and unwieldy than it actually is, if the save is going to be redefined, it might as well be done right.

The short version of the system is as follows:

» Award a **saved game** when a pitcher comes into a game in the sixth inning or later, with the tying run on base or at bat, with a lead of at least one run, does not give up the lead, is the finishing pitcher in the game, and is not the winning pitcher. A pitcher can't get a saved game in a tie game because that would make him the winning pitcher. This is analogous to the current save.

» Award a **saved lead** when a pitcher comes into a game in the sixth inning or later, with the tying run on base or at bat, regardless of the score, and gets out of the inning without giving up either the lead or the tie. This is analogous to the current hold.

» Charge a **blown game** whenever a pitcher comes into a game in the ninth inning or later, regardless of the score, and gives up any kind of walk-off situation before he gets out of the inning. By definition of walk-off, only a visiting pitcher is eligible for a blown game (i.e. one can't give up a walk-off double in the top of an inning).

» Charge a **blown lead** when a pitcher comes into a game, regardless of the score, and gives up either the lead or tie before he can get out of the inning, except when if he would qualify for a blown game.

» These four stats are invoked only when a pitcher enters the game in or after the sixth inning, and only consider the pitcher's performance during the inning in which he enters the game.

In rule book-speak, that would appear like this:

1. For a pitcher to be credited with a Saved Game, all of the following conditions must be met:
   a. His club is leading when he enters the game, and
   b. he enters the game in the sixth inning or later, and
   c. the potential trying run is on base or at bat, and
   d. he records the third out of the inning in which he enters the game, without giving up the lead, and
   e. he is the finishing pitcher in the game, and
   f. he is not the winning pitcher.

2. For a pitcher to be credited with a Saved Lead, he must not qualify for a Saved Game, and must meet all of the conditions in either of the following scenarios:
   a. His club is leading when he enters the game, and
   b. he enters the game in the sixth inning or later, and
   c. the potential trying run is on base or at bat, and
   d. he records the third out of the inning in which he enters the game, without giving up the lead, and
   e. he is not the finishing pitcher in the game.

   * OR *

   a. The score is tied when he enters the game, and
   b. he enters in the sixth inning or later, and
   c. he records the third out of the inning in which he enters the game, without allowing a run.

3. A pitcher may be credited with both a Saved Lead and a win, or both a Saved Lead and a loss.

4. For a pitcher to be charged with a Blown Game, the following conditions must be met:
   a. The pitcher's team is the visiting team, and
   b. he enters the game in the bottom of the ninth inning, or the bottom of any extra inning, and
   c. he allows the winning run to score before he can record the third out of the inning.

5. For a pitcher to be charged with a Blown Lead, he must not qualify for a Blown Game, and must meet all of the conditions in either of the following scenarios:

a. His club is leading by any margin when he enters the game, and

b. he enters the game in the sixth inning or later, and

c. he gives up the lead before recording the third out of the inning in which he enters the game.

* OR *

a. The score is tied when he enters the game, and

b. he enters the game in the sixth inning or later, and

c. he allows a run before recording the third out of the inning in which he enters the game.

6. A pitcher may be credited with either both a Blown Game and a loss, or both a Blown Lead and a win, or both a Blown Lead and a loss.

7. A pitcher may not record more than a total of one Saved Game, Saved Lead, Blown Game, or Blown Lead in any one game, but Saved Leads and Blown Leads may be awarded or charged to more than one pitcher in the same game.

8. Any pitching performance in a subsequent inning shall have no bearing on the assessment of a Blown Game, Blown Lead, Saved Game, or Saved Lead, with the exception of the game-finish requirement for the Saved Game.

9. For the purposes of calculating the relief pitcher award, the point values shall be as follows: Saved Game +5, Saved Lead +4, Win +1, Loss -2, Blown Lead -3, Blown Game -4. A pitcher shall receive points for any win or loss recorded during any relief appearance, regardless of when a pitcher entered a game or how long he pitched in the game.

All of these rules share the same common thread: the pitcher comes into the game in a crisis, one wherein either the lead or the W hangs in the balance. This is why in games where the pitcher's team is ahead, the tying run must already be on base or at bat in order to qualify for either of the two "new saves." A situation where the tying run is on deck will not be a new save opportunity since the game is not in immediate jeopardy; the current hitter would have to somehow reach base in order for the on-deck batter to come to the plate still representing the tying run, and there's something just fundamentally wrong about crediting a pitcher for getting out of a jam that he himself helped create.

Currently, a pitcher can enter the game with the tying run on deck or even still sitting on the bench and qualify for the save. If the tying run is not on base, and not on deck, and may still be in the dugout, then the game isn't really in jeopardy and should not be said to be saved. If the lead is jeopardized, then it is of the pitcher's own doing by allowing the inherited runners to score as well as a few of his own. Right now a pitcher can enter a game where his team is up 5-0 with the bases loaded and two out: Imagine he allows a grand slam, walks two batters, hits a batter, and then gets a fly out on the warning track. He will have allowed four runners to reach base, four runs will have scored after he entered the game, and yet he will still be credited with a save. It sure won't feel like a save to the previous pitcher to whose record three of those runs were charged.

If a pitcher comes into a game with a one-run lead and allows the opponent to tie the game, he is charged with a blown save. But if he gave up a lead of six runs instead of one, he would not receive a blown save. In essence, the current save rule penalizes a pitcher for giving up a small lead but not for squandering a big lead. This alone should be reason enough to reconsider the save rule.

There are several major departures from the conventional save under my system. More than one pitcher can get one of the new saves in the same game. One pitcher can get both a new save as well as either a win or a loss in the same game. A pitcher is eligible for a new save when he comes into a tied game.

One delicate situation is that in which a pitcher is credited with a Saved Lead, only to give up the lead in a subsequent inning. In this situation I have decided not to charge the pitcher with a Blown Game or Blown Lead and allowed the Saved Lead to stand. Once a pitcher has saved the lead, it is now the responsibility of the offense to score insurance runs. If a starting pitcher gives up a lead, he likewise would not be charged with a Blown Lead each time. In the same manner, a reliever entering his second inning of work would, if he gives up the lead, be eligible for a win, loss, or no-decision. He will have done his job insofar as "saving" the game is concerned: preserve either the lead or the tie, and hand the ball off to the offense to either break the tie or extend the lead. Three outs later, when he retakes the mound, he will already be an ensconced participant in the game and will no longer be representing the cavalry riding in to save the day.

To put it another way, this is exactly what already happens with a pinch-hitter whose team bats around: he is considered a pinch-hitter only the first time he comes to bat. If he comes to bat a second time in the same inning and gets a single, it is not considered a pinch-hit. Similarly, I am evaluating a reliever solely on his role as a "pinch-pitcher."

Table 1. The Reliever Rankings

Only pitchers that recorded at least one of the following statistics are listed: Win (in relief), Blown Save, Blown Lead, Loss (in relief), Hold, Saved Game, Save, Saved Lead, Blown Game

Rank	Pitcher	Tm	W	L	SL	BL	SG	BG	SL+SG	BL+BG	Pts	Rlds.
1	Gagne, Eric	LA	7	3	12	5	21	0	33	5	139	142
2	Lidge, Brad	HOU	6	5	17	2	16	1	33	3	134	853
	Smoltz, John	ATL	0	1	7	5	23	0	30	5	126	127
4	Gordon, Tom	NYY	9	4	34	6	1	0	35	6	124	115
	Nathan, Joe	MIN	1	2	7	2	20	1	27	3	115	125
6	Jones, Todd	PHI	11	5	30	5	1	0	31	5	111	6 7
	Cordero, F.	TEX	3	4	4	5	21	1	25	6	97	137
8	Rivera, Mariano	NYY	4	2	6	3	16	0	22	3	95	157
9	Hoffman, Trevor	SD	3	3	5	5	18	0	23	5	92	116
10	Benitez, Armando	FLA	2	2	5	4	16	0	21	4	86	136
10	Torres, Salomon	PIT	7	7	27	5	0	0	27	5	86	-8
12	Rincon, Juan	MIN	11	6	25	7	0	0	25	7	78	813
	Linebrink, Scott	SD	7	3	24	7	0	0	24	7	76	-2
14	Otsuka, Akinori	SD	7	2	22	7	1	0	23	7	75	615
	Ryan, B.J.	BAL	4	6	2	5	17	1	19	6	74	135
15	Isringhausen, J.	STL	4	2	14	3	6	1	20	4	74	42
15	Rodriguez, F.	ANA	4	1	16	9	7	0	23	9	74	32
15	Cordero, Chad	MTL	7	3	26	9	1	0	27	9	74	-2
19	Looper, Braden	NYM	2	5	9	7	13	0	22	7	72	72
20	Tavarez, Julian	STL	7	4	20	2	2	3	22	5	71	15
21	Quantrill, Paul	NYY	7	3	8	5	13	1	21	6	70	99
21	Kolb, Danny	MIL	0	4	21	5	0	0	21	5	70	323
	Shields, Scot	ANA	8	2	16	3	2	0	18	3	69	19
23	Brower, Jim	SF	7	7	24	7	1	1	25	8	69	-4
25	Dotel, Octavio	OAK	6	6	7	9	16	2	23	11	67	92
26	Worrell, Tim	PHI	5	6	18	9	6	1	24	10	64	40
27	Takatsu, Shingo	CWS	6	4	9	2	7	0	16	2	63	61
27	Vizcaino, Luis	MIL	4	4	20	6	1	0	21	6	63	-4
29	Betancourt, R.	CLE	5	6	21	9	3	1	24	10	61	-3
30	Levine, Al	DET	3	4	18	3	0	0	18	3	58	-4
31	Timlin, Mike	BOS	5	4	5	4	9	0	14	4	57	63
31	Wagner, Billy	PHI	4	0	16	3	1	0	17	3	57	-1
33	Baez, Danys	TB	4	4	2	3	13	1	15	4	56	85
33	Marte, Damaso	CWS	6	5	20	9	3	2	23	11	56	835
	Fuentes, Brian	COL	2	4	2	8	14	0	16	8	55	126
35	Foulke, Keith	BOS	5	3	7	9	11	0	18	9	55	86
35	Mesa, Jose	PIT	5	2	17	1	0	1	17	2	55	-6
38	Rodriguez, Felix	PHI	5	8	21	8	1	1	22	9	54	738
	Mota, Guillermo	FLA	9	8	23	9	0	0	23	9	54	-9
40	Cerda, Jaime	KC	1	4	13	1	2	0	15	1	52	-1
41	Embree, Alan	BOS	2	2	16	4	0	0	16	4	50	-2
41	Yan, Esteban	DET	3	6	17	8	3	0	20	8	50	-4
43	Almanzar, Carlos	TEX	7	3	15	4	0	0	15	4	49	443
	Romero, J.C.	MIN	7	4	21	13	1	0	22	13	49	-5
45	Gryboski, Kevin	ATL	3	2	14	4	1	0	15	4	48	4
46	Madson, Ryan	PHI	9	3	12	3	1	0	13	3	47	14
46	Bradford, Chad	OAK	5	7	16	3	1	1	17	4	47	-7
46	Harikkala, Tim	COL	6	6	19	5	0	2	19	7	47	-14
49	Walker, Jamie	DET	3	4	18	6	1	2	19	8	46	-10
50	Riske, David	CLE	7	3	14	6	2	1	16	7	45	950
	Koplove, Mike	ARZ	4	4	18	8	1	1	19	9	45	-6
50	Cormier, Rheal	PHI	4	5	21	11	0	0	21	11	45	-16
53	Rincon, Ricardo	OAK	1	1	15	5	0	0	15	5	44	-8
54	Walker, Tyler	SF	5	1	10	0	0	0	10	0	43	11
54	Colome, Jesus	TB	2	2	9	2	3	0	12	2	43	854
	Duchscherer, J.	OAK	7	6	16	4	0	1	16	5	43	-2
54	Grimsley, Jason	BAL	5	7	22	12	0	0	22	12	43	-22
58	Herges, Matt	SF	4	5	5	10	14	3	19	13	42	55
59	Miller, Matt	CLE	4	1	12	3	0	0	12	3	41	759
	Francisco, Frank	TEX	5	1	11	2	0	0	11	2	41	259
	Mahay, Ron	TEX	3	0	11	2	0	0	11	2	41	262
	Hawkins, LaTroy	CHC	5	4	13	9	6	3	19	12	40	59
62	Mercker, Kent	CHC	3	1	13	3	0	1	13	4	40	-2
64	Myers, Mike	BOS	5	1	13	4	0	1	13	5	39	865
	Eyre, Scott	SF	2	2	15	7	1	1	16	8	38	-4
65	Miceli, Dan	HOU	6	6	16	10	2	0	18	10	38	-5
65	Stanton, Mike	NYM	2	6	20	8	0	2	20	10	38	-20
68	Calero, Kiko	STL	3	1	8	2	2	0	10	2	37	869
	Aquino, Gregori	ARZ	0	2	3	4	8	0	11	4	36	38
70	Frasor, Jason	TOR	4	6	9	6	5	0	14	6	35	46
71	Guardado, Eddie	SEA	2	2	3	6	10	2	13	8	34	44
72	Horgan, Joe	MTL	4	1	8	2	1	0	9	2	33	11
72	Ayala, Luis	MTL	6	12	20	10	1	1	21	11	33	-16
74	Alfonseca, A.	ATL	6	4	11	2	0	1	11	3	32	275
	Dreifort, Darren	LA	1	4	12	5	1	0	13	5	31	-9
76	Carrara, Giovanni	LA	5	2	9	1	0	1	9	2	30	10
76	Politte, Cliff	CWS	0	3	12	0	0	3	12	3	30	-3
78	Wickman, Bob	CLE	0	2	3	3	6	0	9	3	29	33
78	Gonzalez, Mike	PIT	3	1	8	3	1	0	9	3	29	1
80	Brazoban, Yhency	LA	6	2	8	2	0	0	8	2	28	8
80	Cotts, Neal	CWS	4	3	9	2	0	0	9	2	28	-2
80	Telemaco, Amaury	PHI	0	2	8	0	0	0	8	0	28	-4
80	Mecir, Jim	OAK	0	5	15	5	1	3	16	8	28	-14
84	Urbina, Ugueth	DET	4	6	9	3	4	3	13	6	27	53
84	Shouse, Brian	TEX	2	0	7	1	0	0	7	1	27	484
	Remlinger, Mike	CHC	1	2	10	5	1	0	11	5	27	-4
87	Rhodes, Arthur	OAK	3	3	5	4	5	1	10	5	26	17
87	Qualls, Chad	HOU	4	0	5	1	1	0	6	1	26	10
89	Harper, Travis	TB	6	2	8	3	0	0	8	3	25	690
	Howry, Bob	CLE	4	2	10	4	0	1	10	5	24	090
	Reitsma, Chris	ATL	6	4	12	9	1	0	13	9	24	-4
90	Farnsworth, Kyle	CHC	4	5	13	6	0	1	13	7	24	-10
93	Percival, Troy	ANA	2	3	1	6	9	1	10	7	23	88
93	Cruz, Juan	ATL	6	2	6	1	0	0	6	1	23	893
	Kline, Steve	STL	2	2	6	3	2	0	8	3	23	7
96	Sanchez, Duaner	LA	3	1	7	1	0	1	7	2	22	297
	Sosa, Jorge	TB	2	3	5	0	1	0	6	0	21	297
	Lopez, Javier	COL	1	2	9	4	0	0	9	4	21	-4
97	Choate, Randy	ARZ	2	4	11	3	0	2	11	5	21	-8
97	White, Gabe	CIN	1	3	9	5	1	0	10	5	21	-8
97	Adams, Mike	MIL	2	3	11	5	0	1	11	6	21	-12
102	Graves, Danny	CIN	1	6	4	9	10	2	14	11	20	96
102	Julio, Jorge	BAL	2	5	7	7	5	1	12	8	20	53
102	Balfour, Grant	MIN	4	1	6	2	0	0	6	2	20	4
102	Villone, Ron	SEA	6	4	7	2	0	0	7	2	20	2
102	Lopez, Rodrigo	BAL	3	2	6	1	0	0	6	1	20	0
102	Mateo, Julio	SEA	1	2	10	3	0	2	10	5	20	-5
108	Valentine, Joe	CIN	2	2	6	1	0	0	6	1	19	12
108	Gregg, Kevin	ANA	5	2	6	2	0	0	6	2	19	7
108	Eldred, Cal	STL	4	2	7	3	0	0	7	3	19	3
108	Feliciano, Pedro	NYM	1	1	5	0	0	0	5	0	19	0
112	Hermanson, Dustin	SF	2	5	4	1	5	3	9	4	18	40
112	Koch, Billy	FLA	2	3	5	3	3	1	8	4	18	16
112	Parrish, John	BAL	6	2	5	0	0	1	5	1	18	11
112	Christiansen, J.	SF	4	3	6	5	3	1	9	6	18	7
112	Leskanic, Curtis	BOS	3	5	7	3	2	1	9	4	18	1
112	Wagner, Ryan	CIN	3	2	7	3	0	0	7	3	18	-4
112	Bottalico, Ricky	NYM	3	2	10	7	0	0	10	7	18	-6
119	Putz, J.J.	SEA	0	3	7	5	2	0	9	5	17	14
119	Dempster, Ryan	CHC	1	1	4	1	1	0	5	1	17	6
119	Donnelly, Brendan	ANA	5	2	4	0	0	0	4	0	17	6
119	Leicester, Jon	CHC	5	1	5	2	0	0	5	2	17	4
119	Groom, Buddy	BAL	4	1	6	3	0	0	6	3	17	2
124	Crain, Jesse	MIN	3	0	4	1	0	0	4	1	16	4
124	Tucker, T.J.	MTL	4	1	6	2	0	1	6	3	16	2
124	Wellemeyer, Todd	CHC	2	1	4	0	0	0	4	0	16	2
124	Atchison, Scott	SEA	2	3	6	0	0	1	6	1	16	-2
124	Reed, Steve	COL	3	8	16	9	0	2	16	11	16	-18
129	Adams, Terry	BOS	6	4	9	5	0	1	9	6	15	7
129	Wuertz, Michael	CHC	1	0	3	1	1	0	4	1	15	5
129	Ramirez, Erasmo	TEX	5	3	7	4	0	0	7	4	15	0
129	Randolph, Stephen	ARZ	2	2	5	1	0	0	5	1	15	0
129	Lopez, Aquilino	TOR	1	1	4	0	0	0	4	0	15	0
129	Williamson, Scott	BOS	0	1	5	1	0	0	5	1	15	-1
129	Kieschnick, B.	MIL	1	1	5	0	0	1	5	1	15	-2

129	Reith, Brian	CIN	2	2	5	1	0	0	5	1	15	-2
129	Robertson, J.	CLE	1	1	4	0	0	0	4	0	15	-2
138	Affeldt, Jeremy	KC	3	4	1	2	5	1	6	3	14	32
138	Brocail, Doug	TEX	4	1	4	0	0	1	4	1	14	9
138	Williams, Todd	BAL	2	0	3	0	0	0	3	0	14	4
138	Nelson, Jeff	TEX	1	2	5	1	0	0	5	1	14	1
138	White, Rick	CLE	5	5	8	6	1	0	9	6	14	-1
138	Seanez, Rudy	FLA	3	2	7	3	0	1	7	4	14	-2
138	Weathers, David	FLA	6	7	13	10	0	0	13	10	14	-10
145	Sherrill, George	SEA	2	1	7	5	0	0	7	5	13	2
145	Kershner, Jason	TOR	0	0	4	1	0	0	4	1	13	0
145	Miller, Trever	TB	1	1	5	2	0	0	5	2	13	-1
145	Bruney, Brian	ARZ	3	4	6	2	0	0	6	2	13	-4
145	Riedling, John	CIN	5	3	11	10	0	0	11	10	13	-10
145	Bennett, Jeff	MIL	1	5	8	2	0	1	8	3	13	-10
145	Franco, John	NYM	2	7	11	5	0	1	11	6	13	-12
145	Dohmann, Scott	COL	0	3	7	3	0	0	7	3	13	-14
153	Hammond, Chris	OAK	4	1	4	2	0	0	4	2	12	5
153	Martinez, A.	BOS	2	1	3	0	0	0	3	0	12	2
153	Powell, Jay	TEX	1	1	4	1	0	0	4	1	12	0
153	Cormier, Lance	ARZ	0	0	3	0	0	0	3	0	12	0
153	Bartosh, Cliff	CLE	1	0	5	3	0	0	5	3	12	-2
153	Nance, Shane	ARZ	1	1	4	1	0	0	4	1	12	-2
153	Hasegawa, S.	SEA	4	6	11	8	0	0	11	8	12	-14
160	Valverde, Jose	ARZ	1	2	3	3	3	1	6	4	11	20
160	Biddle, Rocky	MTL	1	4	2	4	6	2	8	6	11	19
160	Dessens, Elmer	LA	1	1	2	2	2	0	4	2	11	0
160	Malaska, Mark	BOS	1	1	3	0	0	0	3	0	11	0
160	Wise, Matt	MIL	1	1	3	0	0	0	3	0	11	0
160	Cressend, Jack	CLE	0	1	4	1	0	0	4	1	11	-2
160	Hernandez, R.	PHI	3	5	10	6	0	1	10	7	11	-12
167	Sturtze, Tanyon	NYY	4	2	3	1	1	1	4	2	10	7
167	Wheeler, Dan	HOU	3	1	3	1	0	0	3	1	10	4
167	Madritsch, Bobby	SEA	2	0	2	0	0	0	2	0	10	4
167	Simpson, Allan	COL	2	1	4	2	0	0	4	2	10	0
171	Camp, Shawn	KC	2	2	3	2	1	0	4	2	9	4
171	Beltran, Francis	MTL	2	2	4	2	1	1	5	3	9	3
171	Fortunato, B.	NYM	1	0	2	0	0	0	2	0	9	3
171	Geary, Geoff	PHI	1	0	2	0	0	0	2	0	9	2
171	Jarvis, Kevin	COL	1	0	2	0	0	0	2	0	9	2
171	Rauch, Jon	MTL	1	0	2	0	0	0	2	0	9	2
171	Borland, Toby	FLA	1	1	4	2	0	0	4	2	9	-2
171	Villarreal, Oscar	ARZ	0	2	4	1	0	0	4	1	9	-4
179	Moreno, Orber	NYM	3	1	2	2	1	0	3	2	8	3
179	Gallo, Mike	HOU	2	0	3	2	0	0	3	2	8	2
179	Proctor, Scott	NYY	2	1	3	0	0	1	3	1	8	2
179	Mendoza, Ramiro	BOS	2	1	2	0	0	0	2	0	8	2
179	Alvarez, Wilson	LA	1	1	3	1	0	0	3	1	8	1
179	Howard, Ben	FLA	1	1	3	1	0	0	3	1	8	0
185	Burba, Dave	SF	4	1	6	5	0	1	6	6	7	6
185	Bullinger, Kirk	HOU	1	0	1	1	1	0	2	1	7	3
185	Seo, Jae	NYM	1	1	2	0	0	0	2	0	7	0
185	Serrano, Jimmy	KC	1	1	2	0	0	0	2	0	7	0
185	Eischen, Joey	MTL	0	1	3	1	0	0	3	1	7	-4
185	Nakamura, Mike	TOR	0	3	4	1	0	0	4	1	7	-6
185	Villafuerte, B.	ARZ	0	3	4	1	0	0	4	1	7	-6
185	Fox, Chad	FLA	0	1	3	1	0	0	3	1	7	-6
185	Grabow, John	PHI	2	5	10	10	1	0	11	10	7	-15
194	Hancock, Josh	CIN	2	0	1	0	0	0	1	0	6	4
194	Lima, Jose	LA	2	0	1	0	0	0	1	0	6	4
194	Colyer, Steve	DET	1	0	2	1	0	0	2	1	6	2
194	Yates, Tyler	NYM	1	0	2	1	0	0	2	1	6	2
194	Franklin, Wayne	SF	1	0	3	1	0	1	3	2	6	0
194	Heredia, Felix	NYY	1	1	4	3	0	0	4	3	6	-2
194	Chulk, Vinnie	TOR	1	3	6	3	0	1	6	4	6	-4
201	Jimenez, Jose	CLE	1	7	7	4	2	2	9	6	5	6
201	Bukvich, Ryan	KC	0	0	0	0	1	0	1	0	5	4
201	Cabrera, Daniel	BAL	0	0	0	0	1	0	1	0	5	3
201	Matthews, Mike	CIN	2	1	3	1	0	1	3	2	5	2
201	Ankiel, Rick	STL	1	0	1	0	0	0	1	0	5	2
201	Baek, Cha Seung	SEA	1	0	1	0	0	0	1	0	5	2
201	Boyd, Jason	PIT	1	0	1	0	0	0	1	0	5	2
201	Falkenborg, Brian	LA	1	0	1	0	0	0	1	0	5	2
201	File, Bob	TOR	1	0	1	0	0	0	1	0	5	2
201	Flores, Randy	STL	1	0	1	0	0	0	1	0	5	2
201	Kim, Sun-Woo	MTL	1	0	1	0	0	0	1	0	5	2
201	League, Brandon	TOR	1	0	1	0	0	0	1	0	5	2
201	Lohse, Kyle	MIN	1	0	1	0	0	0	1	0	5	2
201	Oswalt, Roy	HOU	1	0	1	0	0	0	1	0	5	2
201	Padilla, Juan	CIN	1	0	1	0	0	0	1	0	5	2
201	Parra, Jose	NYM	1	0	1	0	0	0	1	0	5	2
201	Smith, Travis	ATL	1	0	1	0	0	0	1	0	5	2
201	Sparks, Steve	ARZ	1	0	1	0	0	0	1	0	5	2
201	Lincoln, Mike	STL	3	2	3	2	0	0	3	2	5	-2
201	Roa, Joe	MIN	2	3	5	1	0	2	5	3	5	-4
201	Reyes, Dennys	KC	2	4	5	3	0	0	5	3	5	-6
201	Ford, Ben	MIL	1	1	3	2	0	0	3	2	5	-6
201	Frederick, Kevin	TOR	0	2	3	1	0	0	3	1	5	-6
224	Borowski, Joe	CHC	2	4	2	3	3	1	5	4	4	19
224	Knotts, Gary	DET	0	0	1	0	0	0	1	0	4	6
224	Huisman, Justin	KC	0	0	1	0	0	0	1	0	4	3
224	Nitkowski, C.J.	NYY	2	1	1	0	0	0	1	0	4	2
224	Vargas, Claudio	MTL	1	1	3	1	0	1	3	2	4	0
224	Backe, Brandon	HOU	1	1	2	1	0	0	2	1	4	0
224	Anderson, Brian	KC	0	0	1	0	0	0	1	0	4	0
224	Astacio, Pedro	BOS	0	0	1	0	0	0	1	0	4	0
224	Beltran, Rigo	MTL	0	0	1	0	0	0	1	0	4	0
224	Roberts, Willis	PIT	0	0	1	0	0	0	1	0	4	0
224	Small, Aaron	FLA	0	0	1	0	0	0	1	0	4	0
224	Tankersley, D.	SD	0	0	1	0	0	0	1	0	4	0
224	Walker, Kevin	SF	0	0	1	0	0	0	1	0	4	0
224	Zambrano, Victor	TB	0	0	1	0	0	0	1	0	4	0
224	Osuna, Antonio	SD	2	1	4	4	0	0	4	4	4	-2
224	Lehr, Justin	OAK	1	1	3	1	0	1	3	2	4	-2
224	Manzanillo, J.	FLA	3	3	4	3	0	0	4	3	4	-3
224	Van Poppel, Todd	CIN	2	3	5	4	0	0	5	4	4	-4
242	Batista, Miguel	TOR	0	1	0	0	1	0	1	0	3	13
242	Rusch, Glendon	CHC	2	0	1	1	0	0	1	1	3	10
242	Fetters, Mike	ARZ	0	1	2	1	0	0	2	1	3	1
242	Thornton, Matt	SEA	1	1	1	0	0	0	1	0	3	0
242	Fikac, Jeremy	MTL	1	2	3	2	0	0	3	2	3	-2
242	Springer, Russ	HOU	0	1	2	1	0	0	2	1	3	-2
248	Dickey, R.A.	TEX	2	0	0	0	0	0	0	0	2	7
248	Field, Nate	KC	2	3	3	3	3	3	6	6	2	4
248	Bell, Rob	TB	2	0	0	0	0	0	0	0	2	4
248	Osborne, Donovan	NYY	2	0	0	0	0	0	0	0	2	4
248	Rodriguez, Eddy	BAL	1	0	1	1	0	0	1	1	2	2
248	Ennis, John	DET	0	0	1	1	0	0	1	1	2	1
248	Perisho, Matt	FLA	5	3	8	7	0	2	8	9	2	0
248	Colon, Roman	ATL	2	1	2	2	0	0	2	2	2	0
248	German, Franklyn	DET	1	0	1	1	0	0	1	1	2	0
248	Wayne, Justin	FLA	3	2	3	3	0	0	3	3	2	-2
248	Greisinger, Seth	MIN	0	1	1	0	0	0	1	0	2	-2
248	Jones, Bobby M.	BOS	0	1	1	0	0	0	1	0	2	-2
248	Moyer, Jamie	SEA	0	1	1	0	0	0	1	0	2	-2
248	Oliver, Darren	HOU	0	1	1	0	0	0	1	0	2	-2
248	Powell, Brian	PHI	0	1	1	0	0	0	1	0	2	-2
248	Pratt, Andy	CHC	0	1	1	0	0	0	1	0	2	-2
248	Meadows, Brian	PIT	2	4	6	4	0	1	6	5	2	-3
248	Corey, Mark	PIT	1	2	2	1	0	0	2	1	2	-4
266	Kinney, Matt	KC	3	2	3	2	0	1	3	3	1	2
266	Chen, Bruce	BAL	1	0	0	0	0	0	0	0	1	2
266	Floyd, Gavin	PHI	1	0	0	0	0	0	0	0	1	2
266	Good, Andrew	ARZ	1	0	0	0	0	0	0	0	1	2
266	Hendrickson, Mark	TB	1	0	0	0	0	0	0	0	1	2
266	Kim, Byung-Hyun	BOS	1	0	0	0	0	0	0	0	1	2
266	Redding, Tim	HOU	1	0	0	0	0	0	0	0	1	2
266	Rodriguez, R.	TEX	1	0	0	0	0	0	0	0	1	2
266	Acevedo, Jose	CIN	0	0	1	1	0	0	1	1	1	0
266	Phelps, Tommy	FLA	0	0	1	1	0	0	1	1	1	0
266	Seay, Bobby	TB	0	0	1	1	0	0	1	1	1	0
266	Borkowski, Dave	BAL	0	0	1	1	0	0	1	1	1	-2
266	De Los Santos, V.	TOR	0	0	1	1	0	0	1	1	1	-2
266	Sullivan, Scott	KC	3	4	5	2	0	2	5	4	1	-4

266	Service, Scott	ARZ	1	1	3	2	0	1	3	3	1	-4
266	Neal, Blaine	SD	1	1	2	2	0	0	2	2	1	-4
266	Nunez, Vladimir	COL	3	3	5	4	0	1	5	5	1	-6
266	Carrasco, D.J.	KC	2	2	4	3	0	1	4	4	1	-6
284	Robertson, Nate	DET	0	0	0	0	0	0	0	0	0	3
284	Gracesqui, F.	FLA	0	1	0	1	1	0	1	1	0	2
284	Halama, John	TB	2	1	0	0	0	0	0	0	0	2
284	Oropesa, Eddie	SD	2	1	0	0	0	0	0	0	0	2
284	Davis, Jason	CLE	0	0	1	0	0	1	1	1	0	0
284	Liriano, Pedro	MIL	0	0	0	0	0	0	0	0	0	0
284	Pulido, Carlos	MIN	0	0	0	0	0	0	0	0	0	0
284	Wakefield, Tim	BOS	0	0	0	0	0	0	0	0	0	0
284	Williams, Randy	SEA	0	0	0	0	0	0	0	0	0	0
284	Bauer, Rick	BAL	1	1	1	1	0	0	1	1	0	-2
284	Ledezma, W.	DET	1	1	1	1	0	0	1	1	0	-2
284	Gaudin, Chad	TB	0	1	2	2	0	0	2	2	0	-4
284	Beck, Rod	SD	0	2	2	0	0	1	2	1	0	-4
284	Hensley, Matt	ANA	0	2	1	0	0	0	1	0	0	-4
284	Patterson, Danny	DET	0	4	5	3	1	2	6	5	0	-6
284	Fassero, Jeff	COL	0	3	3	2	0	0	3	2	0	-6
300	Stone, Ricky	SD	2	2	2	1	0	1	2	2	-1	0
300	Carter, Lance	TB	3	3	3	2	0	1	3	3	-1	-2
300	Ligtenberg, K.	TOR	1	6	5	5	1	0	6	5	-1	-5
300	Mulholland, T.	MIN	1	4	3	2	0	0	3	2	-1	-6
300	DeJean, Mike	NYM	0	5	6	5	0	0	6	5	-1	-10
305	McConnell, Sam	ATL	1	0	0	1	0	0	0	1	-2	2
305	Venafro, Mike	LA	0	0	1	2	0	0	1	2	-2	0
305	Bernero, Adam	COL	1	0	0	1	0	0	0	1	-2	0
305	Bajenaru, Jeff	CWS	0	1	0	0	0	0	0	0	-2	-2
305	Bynum, Mike	SD	0	1	0	0	0	0	0	0	-2	-2
305	Correia, Kevin	SF	0	1	0	0	0	0	0	0	-2	-2
305	Figueroa, Nelson	PIT	0	1	0	0	0	0	0	0	-2	-2
305	Jackson, Edwin	LA	0	1	0	0	0	0	0	0	-2	-2
305	Westbrook, Jake	CLE	0	1	0	0	0	0	0	0	-2	-2
305	Fultz, Aaron	MIN	3	3	6	5	0	2	6	7	-2	-3
305	Boehringer, B.	PIT	1	1	2	3	0	0	2	3	-2	-4
305	Bump, Nate	FLA	2	3	5	6	0	0	5	6	-2	-5
305	Nageotte, Clint	SEA	0	3	1	0	0	0	1	0	-2	-6
318	Tsao, Chin-Hui	COL	0	0	0	1	0	0	0	1	-3	1
318	Aardsma, David	SF	1	0	0	0	0	1	0	1	-3	0
318	Brooks, Frank	PIT	0	0	0	1	0	0	0	1	-3	0
318	Gonzalez, Dicky	TB	0	0	0	1	0	0	0	1	-3	0
318	Reyes, Al	STL	0	0	0	1	0	0	0	1	-3	0
318	Santos, Victor	MIL	0	0	0	1	0	0	0	1	-3	0
318	Thomas, Brad	MIN	0	0	0	1	0	0	0	1	-3	0
318	MacDougal, Mike	KC	1	1	1	2	0	0	1	2	-3	-1
318	Novoa, Roberto	DET	1	1	1	2	0	0	1	2	-3	-2
318	Cubillan, Darwin	BAL	0	0	0	1	0	0	0	1	-3	-2
318	Driskill, Travis	COL	0	0	0	1	0	0	0	1	-3	-2
318	Wendell, Turk	COL	0	0	0	1	0	0	0	1	-3	-2
318	Bell, Heath	NYM	0	2	1	1	0	0	1	1	-3	-6
318	Hernandez, A.	MIL	0	2	1	1	0	0	1	1	-3	-6
318	Martin, Tom	ATL	0	2	5	5	0	1	5	6	-3	-7
333	Durbin, Chad	ARZ	4	3	3	2	0	2	3	4	-4	2
333	Valdez, Ishmael	SD	0	0	0	0	0	1	0	1	-4	0
333	Almanza, Armando	ATL	1	1	0	1	0	0	0	1	-4	0
333	Arroyo, Bronson	BOS	1	1	0	1	0	0	0	1	-4	0
333	Haren, Danny	STL	1	1	0	1	0	0	0	1	-4	0
333	Majewski, Gary	MTL	0	1	1	2	0	0	1	2	-4	-1
333	Dingman, Craig	DET	2	2	1	2	0	0	1	2	-4	-4
340	Darensbourg, Vic	NYM	0	1	0	1	0	0	0	1	-5	-2
340	Diaz, Felix	CWS	0	1	0	1	0	0	0	1	-5	-2
340	Hendrickson, Ben	MIL	0	1	0	1	0	0	0	1	-5	-2
340	Myers, Brett	PHI	0	1	0	1	0	0	0	1	-5	-2
340	Phelps, Travis	MIL	0	1	0	1	0	0	0	1	-5	-2
340	Puffer, Brandon	SD	0	1	0	1	0	0	0	1	-5	-2
340	Soriano, Rafael	SEA	0	3	1	1	0	0	1	1	-5	-8
347	Ortiz, Ramon	ANA	1	2	1	1	0	1	1	2	-6	-2
347	Harville, Chad	HOU	3	2	3	3	0	2	3	5	-6	-6
349	Cunnane, Will	ATL	1	1	0	2	0	0	0	2	-7	-2
350	Speier, Justin	TOR	3	8	6	6	3	4	9	10	-8	3
350	Norton, Phil	CIN	2	5	4	4	0	1	4	5	-8	-10
352	Adkins, Jon	CWS	2	3	2	3	0	1	2	4	-9	-2
352	Nunez, Franklin	TB	0	3	0	1	0	0	0	1	-9	-8
354	Stewart, Scott	LA	1	2	3	5	0	1	3	6	-10	-6
355	Weber, Ben	ANA	0	2	1	1	0	2	1	3	-11	-6
355	Johnston, Mike	PIT	0	3	2	3	0	1	2	4	-11	-8
357	Mantei, Matt	ARZ	0	3	0	4	2	1	2	5	-12	1
358	Bentz, Chad	MTL	0	3	0	1	0	1	0	2	-13	-6
359	Chacon, Shawn	COL	1	9	1	10	7	2	8	12	-16	72

DOES ROLAIDS SPELL RELIEF?

Only 15 pitchers were in both the top 30 of the Rolaids rankings and in the top 30 of my rankings for 2004. This isn't surprising given that I do not discriminate against middle relievers.

Mariano Rivera had the highest Rolaids ranking for all of baseball for 2004, finishing with 157 points: 4-2-53 with 4 blown saves and 2 tough saves. He finished 15 points ahead of National League champion Eric Gagne (7-3-45, 2 BS, 3 TS). How did they fare in my spreadsheet?

My system gave Rivera 95 points, based on a record of 4-2, 6 saved leads, 3 blown leads, and 16 saved games. This placed him sixth among full-time closers and eighth overall. The award for best relief pitcher of 2004 goes to Gagne: 7-3, 12 SL, 5 BL, 21 SG.

Living in the New York area, I mentioned this project to several baseball fans, and narrowly escaped being burned at the stake for daring to suggest the heretical thought that it is possible for there to be a reliever that is better than Mariano Rivera. The reason Mo comes up number eight validates my thesis that the save rule unfairly rewards closers. Rivera came in from the bullpen with:

» the bases empty in 48 of his 57 save opportunities (80.7%),
» the tying run on base or at bat in only 19 of those 57 chances (33.3%), and
» the tying run on base or at bat only *three times in 41 save opportunities with leads of two or more runs (7.32%).*

Comparing this to other top closers in the rankings, we find that the games Rivera saved were actually in jeopardy relatively rarely. This hurt Rivera significantly in the rankings, since no points are awarded for closing out a game where the tying run was neither on nor up when a pitcher is called from the bullpen. Rivera appeared in 38 such games; none of the full-time closers ranked above him recorded more than 28. Rivera's ratio of save opportunities that came with the bases empty was 10 percentage points (80.7%-70.5%) higher than the Major League average, and his proportion of save chances where the tying run was on or up when he came in was 20 percentage points (33.3% to 53.6%) lower than average.

Table 2. Save opportunity analysis for the top six closers of 2004

Pitcher	Bases Empty	Tying Run On or At Bat	2+ Run Lead & Tying Run On or At Bat	Tough Saves
E. Gagne	34-47 (72.3%)	21-47 (44.7%)	4-30 (13.3%)	3-45 (6.7%)
B. Lidge	24-33 (72.7%)	18-33 (54.5%)	3-18 (16.7%)	4-29 (13.8%)
J. Smoltz	34-49 (69.4%)	26-49 (53.1%)	7-30 (23.3%)	7-44 (15.9%)
J. Nathan	43-49 (87.8%)	23-47 (48.9%)	3-27 (11.1%)	1-44 (2.3%)
F. Cordero	42-54 (77.8%)	26-54 (48.1%)	5-33 (15.2%)	2-49 (2.3%)
M. Rivera	48-57 (80.7%)	19-57 (33.3%)	3-41 (7.3%)	2-53 (3.8%)
MLB Total	(70.5%)	(53.6%)	(20.0%)	(7.1%)

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*Includes the total number of save situations (i.e. saves plus blown saves) charged to middle
relievers that probably would not otherwise have become saves had they not been blown. It's the
same principle as a pitcher's errant pickoff throw that becomes a total chance only because it
was scored an error; had the throw been on-target, it wouldn't have been a total chance.
```

Table 3. 2004 Inning-by-inning breakdown

Inning	SG	SL	BG	BL	SL+SG	BL+BG	S+B	S+B%	S%
6	3	302	--	114	305	114	419	11.7%	72.8%
7	5	577	--	244	582	244	826	23.1%	70.5%
8	130	588	--	302	718	302	1,020	28.5%	70.4%
9	300	251	75	177	551	252	803	22.5%	68.6%
10	26	162	38	45	188	83	271	7.6%	69.4%
11	8	88	20	13	96	33	129	3.6%	74.4%
12	6	36	7	11	42	18	60	1.7%	70.0%
13	0	13	2	3	13	5	18	0.5%	72.2%
14	1	10	2	2	11	4	15	0.4%	73.3%
15	2	3	0	1	5	1	6	0.2%	83.3%
16	1	2	0	0	3	0	3	0.1%	100.0%
17	1	0	0	0	1	0	1	0.0%	100.0%
18	0	1	0	1	1	1	2	0.1%	50.0%
Totals	483	2,033	144	913	2,516	1,057	3,573	100.0%	70.4%

```
S+B%: Percentage of total opportunities occurring in that inning. ote that there are fewer
opportunities in the ninth inning than in both the seventh and eighth innings, where the
current professional closers rarely pitch.
```

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S%: Save conversion percentage. Saved Games plus Saved Leads divided by Total Opportunities.
Note that (except for the statistically insignificant 18th inning) the save conversion rate
is lowest in the ninth inning, where the current professional closers typically pitch.
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CONCLUSIONS

Statistics are measurements of game performance. If game strategy emphasizes accumulating a statistic like the RBI, the intent is to actually increase the runs on the scoreboard first and record the RBI on the stat sheet second. It's not the K on the scorecard that a pitcher wants as much as being another one twenty-seventh of the way toward a victory. That he is credited with a K is simply a bonus.

Experience, especially over the last 25 years, has shown that virtually all managers, at one time or another, will allow their game strategy to be dictated by the desire to have one player accumulate statistics. Unlike the RBI or the K, it is the statistic itself and not the game event that it represents that is the primary goal. If this weren't true, then these opportunities would not be reserved for one specific pitcher. It is a statistic, moreover, that unlike virtually every other does not represent a single action in the course of a baseball game and, it must be said, whose definition is both artificial and arbitrary.

Game-threatening situations come and go while the closer, who is supposedly the most lights-out reliever in the entire bullpen, just sits there. The bullpen phone never rings because it is not a "save situation." Even if it is technically a save situation, the manager will often not make the call because that would require the closer to pitch more than one inning. The younger,

Table 4. Team Rolaids Leaders That Did Not Lead Their Own Teams in the Rankings

Closer	Team	Pts.	Team Leader(s)	Pts.
Mariano Rivera	NYY	95	Tom Gordon	124
Billy Wagner	PHI	57	Todd Jones	111
			Tim Worrell	64
Jose Mesa	PIT	55	Salomon Torres	86
Keith Foulke	BOS	55	Mike Timlin	57
Matt Herges	SF	42	Jim Brower	69
			Tyler Walker	43
Gregori Aquino	ARZ	36	Mike Koplove	45
Bob Wickman	CLE	29	Rafael Betancourt	61
			David Riske	45
			Matt Miller	41
Ugueth Urbina	DET	27	Al Levine	58
			Esteban Yan	50
			Jamie Walker	46
Troy Percival	ANA	23	Francisco Rodriguez	74
			Scot Shields	69
Danny Graves	CIN	20	Gabe White	21
Jorge Julio	BAL	20	B.J. Ryan	74
			Jason Grimsley	43
Jeremy Affeldt	KC	14	Jaime Cerda	52
Shawn Chacon	COL	-16	Brian Fuentes	55
			Tim Harikkala	47
			Javier Lopez	21
			Steve reed	16
			Scott Dohmann	13
			Allan Simpson	10
			Kevin Jarvis	9
			Vladimir Nuñez	1
			Jeff Fassero	0
			Adam Bernero	-2
			Chin-Hui Tsao	-3
			Travis Driskill	-3
			Turk Wendell	-3

more inexperienced pitchers are summoned forth when the game is really on the line in the seventh or eighth inning. The closer yet waits in the hope that his team can get out of the jam so that he may be handed another cupcake three-run-lead bases-empty bottom-of-the-order-due-up save. Of the 1,230 saves recorded in 2004, only eight were awarded to pitchers who came into the game with the tying run on base or at bat and pitched more than two innings, common a generation ago but almost unthinkable today; only Esteban Yan accomplished the feat more than once.

It is quite clear that the save rule has outlived its usefulness, at least in its current form, and that it is in dire need of redefinition. The practice of reserving who is supposedly the team's ace reliever for situations that do not require an ace, just so the closer can accumulate statistics, needs to be rethought as it is often not in a team's best interest. Of the top 25 closers in the Rolaids rankings, it turned out that a full 40% of them had teammates that proved to be better able to handle the tough situations anyway.

Until the save rule is changed, managers will allow the closers to keep piling on the stats in safe situations that could reasonably have been handled by the setup man that pitched the eighth (and who will continue to receive an unofficial consolation stat that no one cares about anyway), while not coming into the game at times that you shouldn't trust to the setup man. This system effectively quantifies all relief pitching, which can no longer be said for Rule 10.20.

Table 5. All-Time Postseason Relief Rankings

Rank	Pitcher	Postseasons	W	L	SL	BL	SG	BG	SL+ SG	BL+ BG	Pts.
1	M. Rivera	1995-2004	8	1	15	3	19	0	34	3	152
2	M. Stanton	1991-2002	5	2	15	1	0	0	15	1	58
3	R. Fingers	1971-1981	4	3	6	1	8	1	14	2	55
4	J. Mesa	1995-2000	3	1	5	3	5	0	10	3	37
5	J. Rocker	1998-2001	2	0	5	1	3	0	8	1	34
6	D. Eckersley	1988-1998	1	2	1	0	8	2	9	2	33
7	J. Nelson	1995-2003	2	2	10	2	0	0	10	2	32
	R. Myers	1988-1998	2	2	5	2	4	0	9	2	32
	D. Ward	1989-1993	4	1	5	0	2	0	7	0	32
10	T. Henke	1985-1992	2	0	3	1	4	0	7	1	31
11	G. Gossage	1978-1984	2	1	1	2	6	0	7	2	28
12	B. Lidge	2004	1	0	4	0	2	0	6	0	27
13	M. Jackson	1995-2002	1	2	7	3	2	0	9	3	26
14	J. Franco	1999-2000	2	0	5	1	1	0	6	1	24
15	R. Honeycutt	1983-1996	3	0	6	3	1	0	7	3	23
	P. Assenmacher	1989-1999	1	0	7	2	0	0	7	2	23
	W. McEnaney	1975-1976	0	0	2	0	3	0	5	0	23
18	A. Peña	1981-1995	4	3	5	4	4	1	9	5	22
	D. Cook	1996-2000	2	0	5	0	0	0	5	0	22
20	M. Wohlers	1991-2001	1	2	1	5	7	0	8	5	21
	B. Welch	1978-1981	1	1	3	0	2	0	5	0	21
22	F. Rodriguez	2000-2003	0	3	8	2	0	0	8	2	20
	K. Dayley	1985-1987	1	0	1	0	3	0	4	0	20
	T. Percival	2002	0	0	0	0	4	0	4	0	20
25	R. Mendoza	1997-2004	2	2	5	0	1	1	6	1	19
	R. McDowell	1986-1988	1	0	4	1	1	0	5	1	19
27	T. Martinez	1979-1983	1	0	3	0	1	0	4	0	18
28	T. McGraw	1969-1981	3	3	5	2	2	1	7	3	17
	A. Rhodes	1996-2001	0	1	7	3	0	0	7	3	17
	R. Aguilera	1986-1995	2	1	2	2	3	0	5	2	17
	J. Murphy	1936-1943	2	0	0	0	3	0	3	0	17
	A. Reynolds	1949-1953	2	0	0	0	3	0	3	0	17
33	J. Orosco	1986-1997	3	1	4	2	1	0	5	2	16
	D. Lowe	1998-2004	2	2	4	1	1	0	5	1	16
	J. Wetteland	1995-1999	0	1	3	0	2	1	5	1	16
	G. Jackson	1971-1979	3	0	4	1	0	0	4	1	16
	J. Isringhausen	2000-2004	0	1	2	0	2	0	4	0	16
38	G. McMichael	1993-1996	1	2	4	1	1	0	5	1	15
39	M. Timlin	1991-2004	0	2	7	5	1	0	8	5	14
	A. Embree	1995-2004	1	0	5	1	0	1	5	2	14
41	U. Urbina	2003	1	0	2	2	2	0	4	2	13
	K. Tekulve	1975-1979	0	1	2	1	2	0	4	1	13
	C. Fox	2003	1	0	3	0	0	0	3	0	13
	G. Lloyd	1996-1998	1	0	3	0	0	0	3	0	13
45	Tim Worrell	1996-2003	3	2	5	1	0	1	5	2	12
	N. Charlton	1990-2001	3	1	3	2	1	0	4	2	12
	E. Plunk	1988-1997	1	3	5	1	0	0	5	1	12
	B. McClure	1981-1982	1	2	2	1	2	0	4	1	12
	Todd Worrell	1985	1	1	3	0	1	1	4	1	12
	R. White	2000-2002	1	1	4	1	0	0	4	1	12
	D. Burba	1995-2001	2	1	3	0	0	0	3	0	12
	D. Henry	1997-2000	0	0	3	0	0	0	3	0	12
	B. Ruffin	1995	0	0	3	0	0	0	3	0	12
54	T. Gordon	1998-2004	0	1	4	1	0	0	4	1	11
	V. Blue	1972	0	0	1	1	2	0	3	1	11
	J. Paniagua	2000-2001	1	1	3	0	0	0	3	0	11
	L. Sherry	1959	2	0	1	0	1	0	2	0	11
	B. Sutter	1982	2	0	1	0	1	0	2	0	11
59	J. Smoltz	1999-2004	2	0	1	2	2	0	3	2	10
	B. Kim	2001-2003	0	1	0	1	3	0	3	1	10
	S. Howe	1981-1995	1	0	3	1	0	0	3	1	10
	B. Anderson	1997-2001	2	0	2	0	0	0	2	0	10
	C. Lefferts	1984-1989	2	0	2	0	0	0	2	0	10
	G. Nelson	1988-1990	2	0	2	0	0	0	2	0	10
	C. Pavano	2003	2	0	2	0	0	0	2	0	10
	S. Williamson	2003	2	0	2	0	0	0	2	0	10
	D. Knowles	1971-1973	0	0	0	0	2	0	2	0	10
	B. Kuzava	1951-1953	0	0	0	0	2	0	2	0	10
69	D. Drago	1975	0	1	1	1	2	0	3	1	9
	L. Smith	1984-1988	0	2	2	0	1	0	3	0	9
71	A. Benitez	1996-2000	3	2	6	7	2	1	8	8	8
	M. Remlinger	1999-2003	0	1	3	1	1	1	4	2	8
	D. Robinson	1979-1989	3	1	2	2	1	0	3	2	8
	C. Leskanic	1995-2004	1	1	3	1	0	0	3	1	8
	P. Shuey	1996-2001	1	1	3	1	0	0	3	1	8
	R. Springer	1997-2004	1	1	3	1	0	0	3	1	8
	L. Andersen	1983-1993	0	1	2	1	1	0	3	1	8
	J. Contreras	2003	0	2	3	0	0	0	3	0	8
79	R. Nen	1997-2002	1	0	0	3	3	0	3	3	7
	E. Face	1960	0	0	0	1	2	0	2	1	7
	A. Holland	1983	0	0	0	1	2	0	2	1	7
	P. Ladd	1982	0	0	0	1	2	0	2	1	7
83	C. Carroll	1970-1975	4	2	2	1	1	1	3	2	6
	C. Willis	1991	0	0	3	2	0	0	3	2	6
	M. Guthrie	1991-2003	1	2	3	1	0	0	3	1	6
	J. C. Romero	2002-2004	0	1	3	0	0	1	3	1	6
	T. Forster	1978-1981	1	0	2	1	0	0	2	1	6
	S. Bedrosian	1982-1991	0	0	0	2	2	1	2	1	6
	F. Marberry	1924-1934	0	0	1	1	1	0	2	1	6
90	B. Looper	2003	2	0	1	2	1	0	2	2	5
	H. Casey	1941-1947	2	2	0	1	2	0	2	1	5
	T. Wendell	1999-2000	2	1	2	1	0	0	2	1	5
	S. Belinda	1990-1995	1	0	2	0	0	1	2	1	5
	K. Calero	2004	0	0	2	1	0	0	2	1	5
	G. Swindell	1998-2002	0	0	2	1	0	0	2	1	5
96	D. Quisenberry	1980-1985	3	4	2	3	2	0	4	3	4
	J. Clancy	1985-1991	1	1	2	1	0	0	2	1	4
	J. Powell	1997-1999	1	1	2	1	0	0	2	1	4
	P. Malone	1929-1936	0	1	1	1	1	0	2	1	4
	D. Wall	1998	0	1	1	1	1	0	2	1	4
101	W. Hernandez	1983-1987	0	0	1	2	1	0	2	2	3
	J. Berenguer	1987	0	1	2	1	0	0	2	1	3
103	J. Tavarez	1995-2004	2	4	5	4	0	0	5	4	2
	F. Rodriguez	2002-2004	5	3	3	3	0	0	3	3	2
	D. Miceli	1998-2004	1	4	4	1	0	1	4	2	2
	D. Giusti	1970-1975	0	2	0	3	3	0	3	3	2
	S. Kline	2001-2004	0	1	2	0	0	1	2	1	2
	T. Mulholland	1998-2004	0	1	2	0	0	1	2	1	2
109	D. Smith	1980-1986	1	1	3	2	0	1	3	3	1
	J. Nathan	2003-2004	0	2	2	1	0	0	2	1	1
111	K. Foulke	2000-2004	1	2	2	2	1	1	3	3	0
112	J. Reardon	1981-1992	2	3	2	2	1	1	3	3	-1
113	T. Hoffman	1996-1998	1	2	1	3	2	1	3	4	-2
	R. Moret	1975	1	0	1	1	0	1	1	2	-2
115	R. Eastwick	1975-1978	4	0	0	4	1	0	1	4	-3
	R. Reed	1976-1983	0	1	2	3	0	0	2	3	-3
	J. Sambito	1980-1986	1	1	1	2	0	0	1	2	-3
	C. Bradford	2000-2003	0	0	1	1	0	1	1	2	-3
119	R. Rincon	1999-2003	0	0	1	2	0	1	1	3	-6
	D. Stanhouse	1979	1	2	1	1	0	1	1	2	-6
	J. Howell	1985-1988	0	2	0	1	1	1	1	2	-6
122	T. Niedenfuer	1981-1985	0	2	0	2	1	1	1	3	-9
	E. Watt	1969-1973	0	2	1	3	0	0	1	3	-9
	M. Henneman	1987-1996	1	0	0	2	0	1	0	3	-9
	D. Holmes	1995-2002	1	0	0	2	0	1	0	3	-9
126	H. Parker	1973	0	2	0	2	0	0	0	2	-10
127	M. Williams	1989-1993	2	2	0	4	1	1	1	5	-13
128	C. Schiraldi	1986	0	3	0	3	1	1	1	4	-14
	R. Hernandez	1993-2003	0	1	0	0	0	3	0	3	-14

Professional Thieves vs. the Constabulary

Who are the *professional thieves* (base stealers) and who are the *top cops* (catchers)? How do we differentiate professional from amateur? Do arrests by the constabulary (caught stealing by the catcher) measure greatness in a backstop or is it pure ineptness by the thief?

An analysis of Retrosheet data from 1963 to 2004 was performed to answer these and other questions. During the data period there were 174,570 stolen base attempts (SBA) involving 61,131 runner-catcher match-ups. The breakdown of these SBA's is:

Table 1. Stolen Base Attempts by Base

	SB	CS	SBA	SB%
Second Base	107,998	39,736	147,734	.731
Third Base	16,379	6,511	22,890	.716
Home	1,476	2,470	3,946	.374
Total	125,853	48,717	174,570	.721

To separate the professional thief from the amateur, all 3,223 runners' efforts were categorized by their success or failure at each base. Because the success rate at stealing third or home was lower than the theft rate of second, the top 1% of the runners who attempted third or home were selected out and designated as the professional thieves. As expected, the usual suspects (Henderson, Brock, Coleman, Carew, and Raines) made the list of 32. (See Table 8).

The success rate for all runners attempting to steal third base was 71.6%. Of the 32 professional thieves, only four had a worse rate than the MLB average. These *gone-to-the-well-too-often* guys were Lou Brock, Brett Butler, Jose Cardenal, and Rod Carew. The player that had the best success-rate at stealing third was Roberto Alomar with 89.0% (138 out of 155 attempts). The worst professional was Rod Carew with 59.3% (32 out of 54 tries). The most attempts were tried by Rickey Henderson (403), and the fewest attempts by a professional goes to Rod Carew (54).

CHUCK ROSCIAM has been a SABR member since 1992. He is a retired Navy Captain, and created the Encyclopedia of Baseball Catchers web site.

How well did our professionals do compared to the 3,191 amateurs? Even though our professionals represented only 1% of all thieves, they accounted for 18.8% of all successful thefts of third base. Their success rate was 13% better than the amateurs as the following table shows.

Table 2. Professionals vs. Amateurs In Third Base Thefts

	SB3	CS3	SB3%
Pros	3,077	650	.826
Amateurs	13,302	5,861	.694
Total	16,379	6,511	.716

The master thieves among the professionals were the ones that tried a theft of home. In the data sample there were 1,413 different thieves that attempted this feat. Only 794 were successful at least once or slightly more than half (56.2%). Among our 32 professionals, nearly a third (10) had an average worse than the whole sample (37.4%). The most attempts were tried by Rod Carew (30), and the fewest attempts by our professionals was 1 by Kirk Gibson.

The most successful thefts of home were 20 by Rod Carew. However, this is far short of the MLB record of 54 by Ty Cobb. In fact, Carew's total is only good for ninth on the all-time list.

Again, we can compare the professionals against the amateurs when it comes to racing home. The elite 1% captured 8.6% of all of the steals of home, which was only half as good as their third base nabbing. The pros' success rate was 15% better than the amateurs.

Table 3. Professionals vs. Amateurs in Stealing Home

	SBH	CSH	SBH%
Pros	127	118	.518
Amateurs	1,349	2,352	.364
Total	1,476	2,470	.374

Now let's turn to the constabulary, the ones whose job it is to catch those pesty base stealers. In our data sample there were 630 different catchers. To determine who were the *top cops* a criteria of a minimum of 275 nabbed thieves was estab-

lished. For this study caught stealing also included pickoffs of the runners when the catcher threw to the base. The criteria yielded 35 catchers or 5.5% of the total backstops, which are now labeled as *top cops*. (See Table 9).

The success rate of these *top cops* at catching thieves at all bases was 33.5% as compared to the *beat cops* rate of 26.1% or the total sample of 27.9%. Even though our top cops only represented 5.5% of the constabulary, they made 29.9% of the arrests.

Table 4. Top Cops vs. Beat Cops at Nabbing Thieves

	CS	SBA	CS%
Top Cops	14,580	43,581	.335
Beat Cops	34,137	130,989	.261
Total	48,717	174,570	.279

Did the high success rate of stopping crime on the bases detour our thieves? No. The top cops were involved in 25% of all of the attempts at thievery. Who caught the most? That honor belongs to Gary Carter, who nabbed 772 runners. Who among our top cops had the fewest? That was Rich Gedman with 276. The best percentage of catching base stealers is owned by Ivan Rodriguez (48.4%), and the worst record is held by Mike Piazza (20.8%).

How did our top cops fair at the various bases? The following table provides the answer (pickoffs shown but not included in the totals).

Table 5. Top Cops' Record at the Bases

	CS	SBA	CS%
1st Base (PK)	424	---	
Second Base	12,354	38,156	.324
Third Base	1,370	3,888	.352
Home	432	646	.669
Total	14,156	42,690	.332

The next logical step is a side-by-side comparison of the professional thieves' success rate at the various bases as compared to the top cops. [It should be remembered that the thieves' record is against all catchers and that the top cops' record is against all thieves.] Table 6 entries for the catchers have been "flipped over" (SB rate versus CS rate) to provide a quick illustration without having to do the math.

Table 6. Professional Thieves vs. Top Cops

	Thieves SB%	Cops SB%	Diff.
Second Base	.842	.676	+.166
Third Base	.826	.648	+.178
Home	.518	.331	+.187
Total	.817	.668	+.149

On the average, the top cops are 14.9% better at catching all thieves than are the professional thieves at stealing against all cops. It appears that, generally, crime doesn't pay.

The last, and obvious, question is how did the 32 professional thieves do against the 35 top cops in a head-to-head match? The answer will have to be given in another article. But, to round out this study I selected one matchup out of the thousands in the data. Taking the Number One Professional Thief (Roberto Alomar) against the Number One Top Cop (Ivan Rodriguez), the results of the matchup yield:

Table 7. Alomar vs. Rodriguez

	SB	CS	SB%
Second Base	8	4	.667
Third Base	3	3	.500
Home	0	0	.000
Total	11	7	.611

Although the sample is very small, one can opine that the *top cop* (Rodriguez) got the better of the professional thief (Alomar) in their 18 confrontations. However, Alomar was successful 61.1% of the time compared to all other runners who only managed a theft 51.6% of the time against Rodriguez. But, the *professional thief* met his nemesis in Rodriguez because Alomar was used to stealing 80.9% of his attempts. His success rate dropped 20% which seems to say, once again, that crime doesn't pay when a runner is up against the *top cops*.

Table 8. Professional Thieves

RUNNER	SBA3	SB3%	SBH	SBH%	SBP	CSP	SBAP	SBP%
R. Alomar	155	.890	3	.333	139	19	158	.880
B. Campaneris	153	.889	2	.000	136	19	155	.877
Eric Davis	111	.883	2	.000	98	15	113	.867
Devon White	78	.872	3	.667	70	11	81	.864
Vince Coleman	223	.879	9	.444	200	32	232	.862
M. Grissom	109	.862	4	.750	97	16	113	.858
Omar Vizquel	107	.860	5	.800	96	16	112	.857
Barry Larkin	144	.875	7	.429	129	22	151	.854
Davey Lopes	107	.860	9	.667	98	18	116	.845
Paul Molitor	117	.855	16	.750	112	21	133	.842
Tony Gwynn	101	.861	6	.500	90	17	107	.841
C. Knoblauch	85	.835	2	1.000	73	14	87	.839
R. Henderson	403	.836	12	.667	345	70	415	.831
Otis Nixon	145	.848	7	.429	126	26	152	.829
Tim Raines	101	.842	8	.500	89	20	109	.817
Craig Biggio	137	.818	3	.667	114	26	140	.814
Barry Bonds	109	.835	6	.333	93	22	115	.809
Willie Wilson	88	.818	3	.333	73	18	91	.802
Jeff Bagwell	76	.789	5	.800	64	17	81	.790
D. DeShields	100	.810	4	.250	82	22	104	.788
Larry Bowa	83	.819	13	.538	75	21	96	.781
Kenny Lofton	141	.794	5	.400	114	32	146	.781
Ozzie Smith	106	.849	15	.200	93	28	121	.769
Eric Young	108	.787	10	.500	90	28	118	.763
Kirk Gibson	79	.759	1	.000	60	20	80	.750
Billy North	89	.742	2	.500	67	24	91	.736
Larry Walker	81	.778	12	.250	66	27	93	.710
Lou Brock	83	.711	3	.667	61	25	86	.709
Brett Butler	87	.713	8	.625	67	28	95	.705
Steve Sax	87	.747	8	.250	67	28	95	.705
Jose Cardenal	80	.700	22	.545	68	34	102	.667
Rod Carew	54	.593	30	.667	52	32	84	.619

Table 9. Top Cops

Catcher	SB	CS	PK	CSPK	SBA	CS%
Ivan Rodriguez	534	424	76	500	1034	.484
Thurman Munson	533	394	38	432	965	.448
Johnny Bench	556	384	47	431	987	.437
Bob Boone	1108	637	77	714	1822	.392
Jim Sundberg	1012	578	63	641	1653	.388
Steve Yeager	595	319	44	363	958	.379
Charles Johnson	517	287	10	297	814	.365
Rick Dempsey	770	415	25	440	1210	.364
Manny Sanguillen	498	267	15	282	780	.362
Lance Parrish	1043	557	29	586	1629	.360
John Stearns	500	258	21	279	779	.358
Butch Wynegar	708	370	13	383	1091	.351
Darrell Porter	902	459	26	485	1387	.350
Gary Carter	1498	716	56	772	2270	.340
Bill Freehan	716	344	20	364	1080	.337
Brad Ausmus	698	340	13	353	1051	.336
Milt May	724	346	12	358	1082	.331
Terry Steinbach	765	367	7	374	1139	.328
Ted Simmons	1188	547	32	579	1767	.328
Mike Heath	571	273	5	278	849	.327
Benito Santiago	995	426	52	478	1473	.325
Tony Pena	1224	545	39	584	1808	.323
Rick Cerone	705	323	13	336	1041	.323
Jody Davis	815	367	21	388	1203	.323
Pat Borders	608	277	10	287	895	.321
Carlton Fisk	1302	578	22	600	1902	.315
Rich Gedman	633	262	14	276	909	.304
Bruce Benedict	772	329	6	335	1107	.303
Bo Diaz	686	281	16	297	983	.302
Mike Scioscia	952	381	23	404	1356	.298
Ernie Whitt	691	282	9	291	982	.296
Joe Girardi	798	300	3	303	1101	.275
Terry Kennedy	1051	362	15	377	1428	.264
Alan Ashby	1112	379	13	392	1504	.261
Mike Piazza	1221	315	6	321	1542	.208

Data courtesy of Retrosheet (A.L. only) 1963, 1965-68; (A.L. & N.L.) 1969-2004

Win Shares and the Parabolic Course of Baseball Lives

In his book entitled *Win Shares*, Bill James undertakes a preliminary analysis of "aging patterns" by studying position players who earned at least 280 win shares during their careers.[1] He remarks, "If you want a 'clean' study of aging patterns among baseball players, the only guys you can really study are the great players" because "great players are the only players who have 'clean' careers with a full opportunity." He goes on to say, "Studying aging in baseball players is a complicated, messy business because, for one thing, the cast of characters changes so much. If you study all 23-year-old major league players, and then you study all 33-year-old major league players,you'll find that you are looking at different groups of men. Most of the guys who play the majors at 23 are gone long before age 33, and many or most of the players who are in the majors at 33 weren't there when they were 23."

There is a way to circumvent this problem, one that allows the careers of unchanging groups of players to be followed throughout their baseball lifetimes. This will be described below as Method 1. But first I wish to introduce the idea that the level of baseball performance tends to follow a parabolic course, as it rises and then falls over the span of a player's career in such a way that the longer a career, the greater a player's peak performance is likely to be. This concept is illustrated schematically in Figure 1, which depicts a parabolic curve where win shares (per season) is plotted for a span 20 seasons, reaching a peak of about 25 win shares before descending symmetrically to zero. There are three additional sets of axes on the chart. Each of these defines a shorter career length that is fitted into the basic parabola; spans of 5, 10, 15, and 20 years are indicated. The distance from each horizontal axis to the peak of the parabola (indicated by the lengths of the arrows) determines the magnitude of a player's peak contribution.

WIN SHARES

When my copy of the eighth edition of *Total Baseball* arrived during the summer of 2004, I was delighted to discover that

Following **BOB BOYNTON**'s retirement from academe (UCSD) in 1991, he turned full time to baseball writing. This is his 16th baseball publication, seven of them in SABR journals.

Figure 1. A schematic diagram showing how careers of various lengths limit the accumulation of win shares.
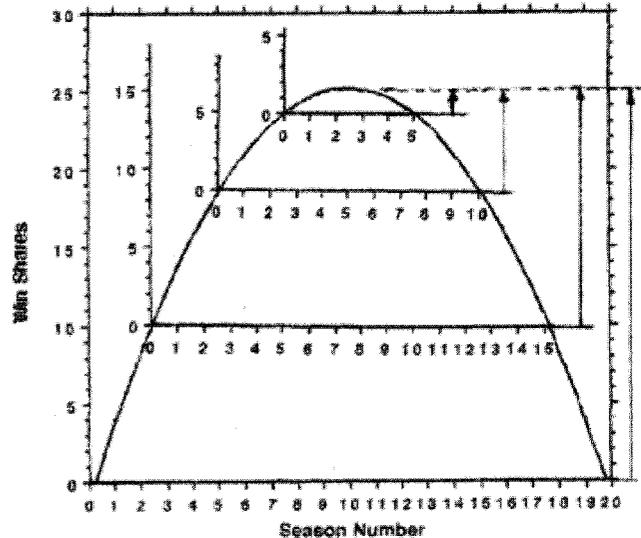
win shares had been calculated for every player in the book.[2] Because I consider win shares to afford the best overall index of baseball performance yet devised, I decided to make use of these numbers.

For a particular player during a major league season, win shares relates to the fraction of his team's victories that are attributed to that player. Win shares is not a rate statistic like batting average, but rather a counting one, like RBI or the number of home runs. Therefore, other things being equal, the more playing time a player has, the higher will be his win share value.

To illustrate how the system works, consider two teams from the 2001 National League season, Atlanta and San Diego. Team win shares are divided as follows:

	Hitting	Fielding	Pitching	Total
Atlanta	104.1	46.4	113.5	264
San Diego	147.9	28.3	60.8	237

To create units of a convenient size, James decreed that a team would be credited with three win shares for each victory

during its major league season. (From this, in can be deduced that Atlanta won 88 games, San Diego, 79.) Win shares for each team have been divided among all players who won at least one win share—33 Atlanta Braves and 38 San Diego Padres. Here is how the top ten players on these teams were ranked by the win shares statistic:

Atlanta Braves (264)		San Diego Padres (237)	
C. Jones 3B	29	P. Nevin 3B	31
A. Jones OF	22	R. Klesko 1B	29
G. Maddux SP	20	B. Trammel OF	17
B. Jordan OF	19	M. Kotsay OF	16
J. Burkett SP	17	B. Davis C	15
T. Glavine SP	16	R. Henderson OF	12
J. Lopez C	13	D. Jackson 2B	11
B. Surhoff OF	12	T. Hoffman RP	9
R. Furcal SS	9	D. Jiminez SS	8
M. Giles 2B	9	M. Darr OF	7

Note how pitchers and position players are intermingled; this is a unique feature of the win shares rating system. Three starting pitchers are on the Atlanta list, whereas closer Trevor Hoffman is the only San Diego pitcher to make the top ten. Despite playing on a poorer team, Phil Nevin was able to garner two more win shares than Chipper Jones, the Atlanta leader. In this example, Jones won 11 percent of Atlanta's 264 win shares whereas Nevin earned 13 percent of San Diego's 237.

CAUSES

Although it is my purpose to document the rise and decline of baseball performance, rather than to speculate about why it happens, a few words about likely causes are in order. Until the age of about 28, there seems to be an increase in physical strength and agility, bolstered by the fruits of experience. After age 30 or so, physical abilities decline. For many activities, such as golf or bowling, this would hardly be noticed, but playing baseball at the major league level is a very demanding business. As the aging process continues, very few, even among this highly select group, are able to remain on a major league roster beyond age 40. Most are gone long before that.

Baseball players are plagued by injuries, mostly minor ones. The more time a player spends on the disabled list, the less he can contribute to his team. Younger players are less likely to be injured than older ones, and they probably heal faster. Over the years, injuries take their toll as eyesight dims, bat speed slows, and the eye-hand coordination of youth is compromised by the normal aging process.

METHOD 1

There is a way to get around the messy problem described by James. Using *Total Baseball* as my data source, and win shares as the measure of performance, I examined 120 position players (40 in each of three groups) whose careers lasted exactly 10, 15, or 20 years. The 10- and 15-year players were, in each case, the first 40 listed alphabetically[3] in *Total Baseball*. Because there have been fewer than 40 players whose careers lasted exactly 20 years, this group was supplemented by adding a few who played for 21, with the final year (usually carrying a very small win-shares value) ignored.

I also studied 110 pitchers. As with the position players, there were 40 in each of the groups who had played for exactly 10 or 15 seasons. However, because I exhausted the supply of 20-year pitchers, I added data from some who played for 19 and 21 years. For the 19-year players I assumed a value of zero for year 20, and I lopped off the last year for those in 21-year group. Even so, I decided to quit with a group of only 30 rather than to extend the age range any further.

RESULTS: METHOD 1

Figure 2 shows how average win shares rise and fall as the seasons progress. Although the membership of each of the six groups is stable, the ages of the players differ depending upon players' ages during their debut seasons.

The smooth curves drawn through the 10- and 15-year data are best-fitting parabolas. The fit for both 10-year groups is excellent and for the 15-year groups it is not too bad. However, parabolas fit the data of the 20-year players very poorly; the smooth curves are instead best-fitting fifth-order polynomials.

The performance of the 20-year players begins to follow a parabolic course, rising to great heights as expected, but at about the eighth season, near the peak year for 15-year players, the 20-year curves decline only gradually for the next seven or eight years, so that the inevitable final decline is postponed.

After only two or three seasons, the 20-year players are already garnering win shares faster than the players in the 10-year group, and by their fourth season they have eclipsed the peak performance of the 15-year players. Fifteen years after their debuts, the 20-year position players, though heading downhill, are still performing at or better than the peak level of the 15-year players.

Overall, the position players accrued about 25 percent more win shares than their pitching counterparts. Average lifetime win shares for the six groups are as follows:

Group	Win Shares
Position players 10 yr	67
Position players 15 yr	177
Position players 20 yr	312
Total	556

Figure 2. Win shares plotted as a function of players' seasons of play, in which case they form stable groups that include various ages of players. This is defined as Method 1 in the text. Data for 10- and 15-year position players and pitchers are fit with parabolas. The curve drawn through the 20-year data is a fifth-order polynomial.
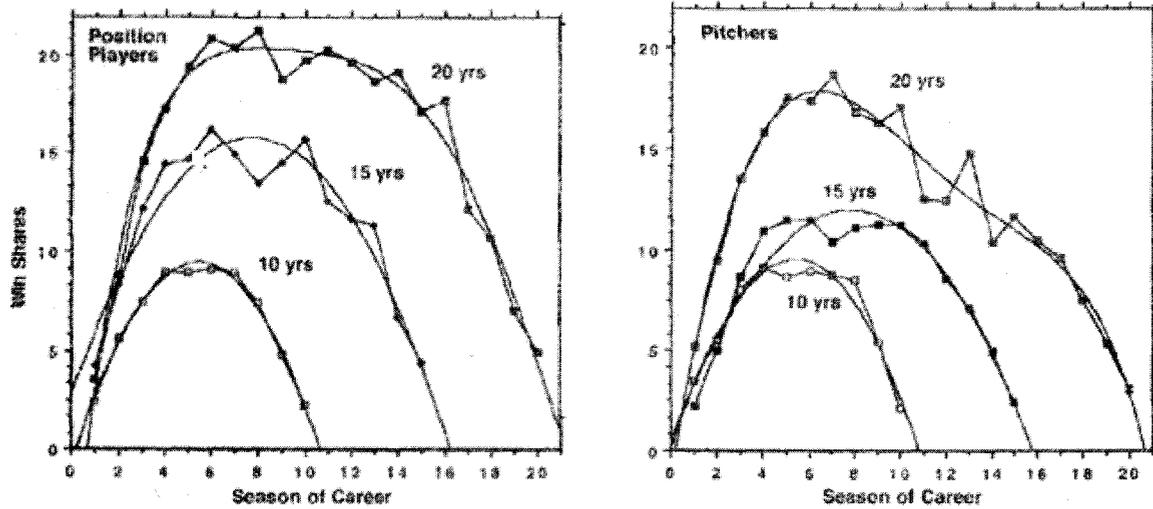
Figure 3. Win shares plotted as a function of chronological age. This is defined as Method 2 in the text. The filled data points are for years when all players in the sample were active. The number of players varies in all other cases, becoming very small at the tails of the curves (see Table 1).

```
Pitchers 10 yr          68
Pitchers 15 yr         127
Pitchers 20 yr         248
Total                  443
```

None of the extra Win Shares for Position Players derive from the 10-year group. If the win share statistic discriminates against pitchers, one would expect it to do so for the 10-year group as well. Therefore it seems likely that position players with long careers actually do contribute more to their teams' wins than do their pitching counterparts.

The major limitation of the Method 1 is the considerable variation in the ages of the players during their careers. The 10-year players debuted over a range from ages 20 to 27; the 15-year players, from 17 to 26; and the 20-year players from 18 to 24. This means last players to retire for the three groups did so at ages 37, 41, and 44.

METHOD 2: RESULTS

When the data are plotted as a function of chronological age[4] (the "messy" procedure discussed by James) the curves of Figure 3 result. A scan of Table 1 reveals that (1) position players tend to debut earlier than pitchers, (2) many more pitchers than position players are active after age 40 (all in the 20-year group), and (3) almost all players are active at ages 27, 28, and 29.

The data are "messy" because win share values derive from the contributions of a variable number of players at various ages. Consequently the 10-year average curve covers about 15 years, that of the 15-year players more than 20, and the 20-year group more than 25. These curves therefore cannot be matched by any real players.

SOME INDIVIDUAL DATA

Figure 4 plots win shares vs. chronological age for a tiny selection of the 230 pitchers and position players in this study. Total lifetime win shares are shown for each. These plots provide a takeoff point for a very preliminary look at individual player performance, a subject that deserves a thorough investigation but is beyond the scope of this paper. All of these players (except Ruth) are in the 20-year group of position players having an average lifetime total of 312 win shares.

The graphs are ordered according to the total lifetime win shares accumulated by each player (values shown on graphs). Although Babe Ruth was not included in the group of 40 position players studied (he played too many years) I have included his graph anyway: his total of 756 lifetime win shares is the all-time record, one that is not likely to be broken soon. (Cobb 722, Wagner 655, Aaron 643, and Mays 642 are next on the lifetime win shares list.) Also, Ruth's 55 win shares at age 26 is second

Table 1. Players Active at Various Ages in Each Group

Age	Position Players 10yr	Position Players 15yr	Position Players 20yr	Pitchers 10yr	Pitchers 15yr	Pitchers 20yr
17	--	--	2	--	--	--
18	1	2	7	--	1	1
19	2	3	13	--	2	3
20	5	7	22	5	6	6
21	8	13	33	9	12	7
22	12	22	38	16	19	14
23	18	32	40	28	30	24
24	28	36	40	30	32	28
25	34	38	40	36	27	29
26	37	39	40	39	40	30
27	39	40	40	40	40	30
28	38	40	40	40	40	30
29	38	40	40	40	40	30
30	35	40	40	36	40	30
31	32	40	40	32	40	30
32	27	40	40	24	40	30
33	21	38	40	12	39	30
34	12	37	40	11	38	30
35	7	33	40	5	34	30
36	3	28	40	1	30	30
37	1	19	38	--	20	30
38	1	7	34	--	11	29
39	--	4	27	--	8	27
40	--	2	18	--	3	24
41	--	1	5	--	--	24
42	--	1	1	--	--	14
43	--	--	1	--	--	7
44	--	--	1	--	--	2

Figure 4. Annual win shares data for a sample of 20-year position players. The average lifetime win share value for the 40 players in this group was 312. Values for individual players are shown. The smooth curve is that of Figure 2 arbitrarily set to zero near age 20.
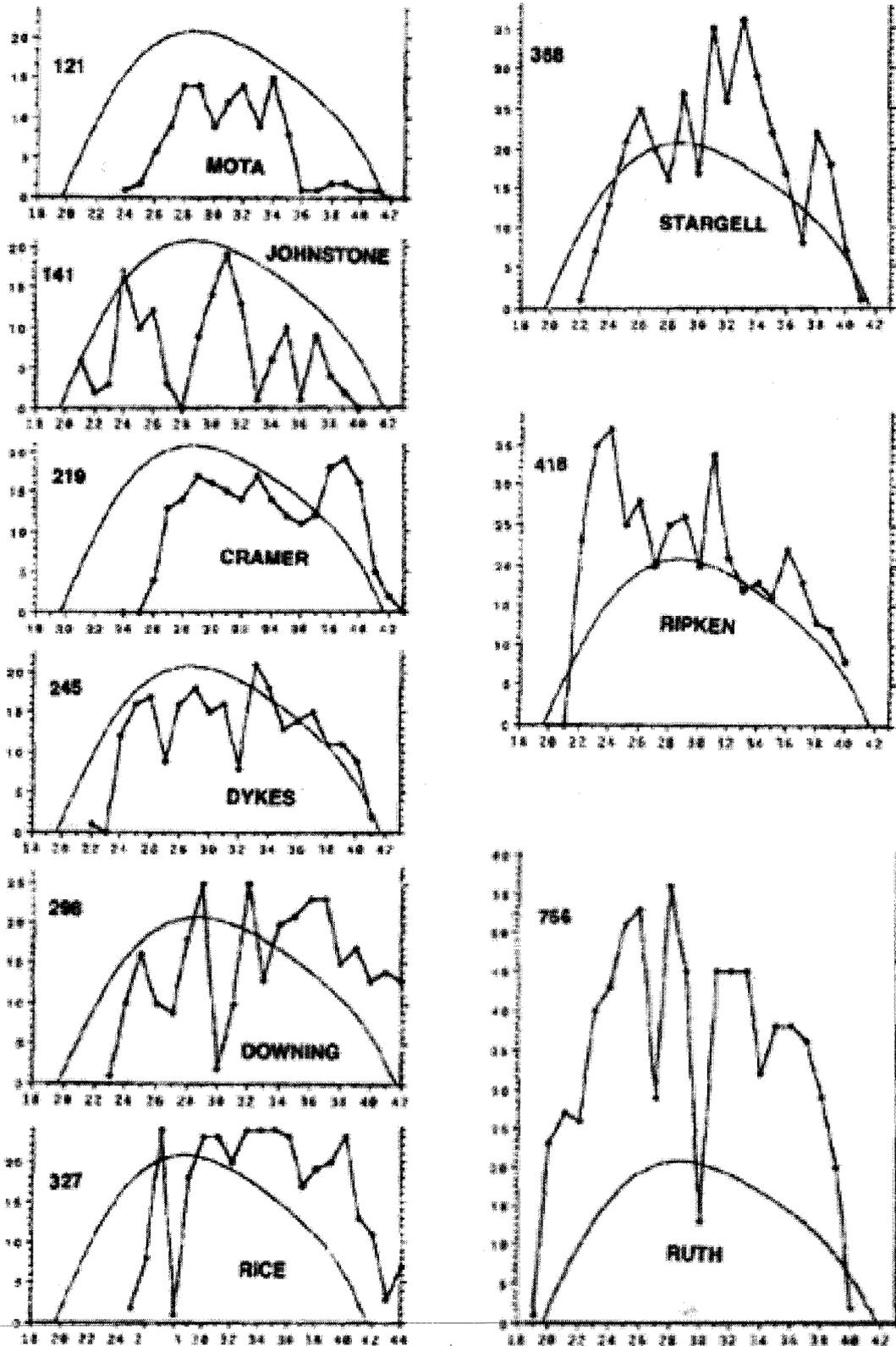
only to Honus Wagner's 59 at age 34. (Walter Johnson and Barry Bonds are next on this list, tied at 54.)

Manny Mota started late, leveled off after a few years, then dropped precipitously after age 34 with fewer than 70 at-bats each season, mostly as a pinch-hitter. Jay Johnstone is an example of severe up-and-down performance variations and an array of win-share seasons that are almost all below the average curve.

Doc Cramer was another late starter who peaked at a venerable 39 and lasted until age 43. Jimmy Dykes's career more or less follows an average course except for a somewhat late start and miscellaneous fluctuations. Except for a few bad years, Brian Downing improved until age 38 before drifting downward, still remarkably productive during his last season at age 42. Sam (not Jim) Rice took off like a rocket and rose spectacularly before being sidelined with only seven at-bats during his third season. After that, Rice was a steady, outstanding performer all the way to age 40, still contributing at age 44.

With ups and downs (where even the "downs" represent good seasons) Willie Stargell peaked at age 33, declined rapidly but then had very good years at ages 38 and 39 before suffering a final rapid descent. Cal Ripken had only 39 at-bats during his inaugural season, insufficient even to earn a single win share that year, but his total rose spectacularly during the next season when he started playing regularly. Even his poorer seasons are close to the average curve. Ripken's win shares descended slowly after age 32, yet he was still playing above average at age 40 during his last season.

Babe Ruth? His record speaks for itself. Following his difficult season in 1925 at age 30 some people thought that he might be on his way out. How wrong they were! Although this is an extreme case, temporary mid-career dips are quite common. Trying to predict what a player will do, based on his prior win-share record, is no easier than trying to predict the weather: there are simply too many variables involved. Nor is it easy to forecast the length of a player's career based on his age during his first season. What does seem to be almost universally true is that, once given a chance to play regularly, the win shares of players who will become stars take off very rapidly.

SUMMARY

This study has used win shares as an index of baseball performance across major league seasons. By analyzing groups of ballplayers who have played for exactly 10, 15, or 20 years, stable groups of players can be followed as their seasons progress, although their ages differ. This is preferable to comparing players of the same age whose careers are at various stages, especially because not all players are

represented at all ages—what Bill James described as a "messy" situation.

Results for pitchers and position players are virtually identical for the 10-year players. For the 15- and 20-year groups, position players accrue significantly more win shares than pitchers. This is probably not an artifact of the win shares system.

For the 10- and 15-year career players, the average win share data are reasonably well described by a parabola, rising during the early years, reaching a peak around age 28, then descending symmetrically toward retirement. Star players in the 20-year group exhibit unusual mid-career "staying power."

The data support the idea that the length of a baseball career depends upon the basic ability of the player. The great ones are already performing at a superior level by their third season, and they play for a long time.

Notes

1. James, Bill, and Jim Henzler. *Win Shares*. Morton Grove, IL: STATS Inc., 2002. Although Henzler is listed as co-author, the writing is vintage James. The section on "Aging Patterns Among Great Players" (pp. 199-202) is one of 40 "Random Essays" in Section IV of the book.
2. Thorn, John, Phil Birnbaum, and Bill Deane, eds. *Total Baseball*. Wilmington DE: Sports Media Publishing, 2004.
3. This method is essentially equivalent to a random selection. In the Player and Pitcher Registers, there is for each player a final line of summary statistics with the number of years of a career indicated just to the right of the word "Total" at the far left. Win shares are listed in the second column from the right under the heading "WS." Players active in 1993 or who appeared in any games before 1901 have been excluded.
4. Age is defined as the difference between the season of play and birth year, without regard to month, as if all players were born on January 1 of their birth years.

The Effect of the Designated Hitter Rule on Hit Batsmen

When the Designated Hitter (DH) rule went into effect at the start of the 1973 season, Major League Baseball (MLB) changed in more ways than one. Among the many changes across offense and defense was the effect that the DH had, and continues to have, on pitchers and hit batsmen. Previous writings and the raw data have contended that the DH rule has caused more American League (AL) hitters to be hit by pitches than their National League (NL) counterparts due to the AL pitchers not facing possible retribution for their actions. While more AL batters are hit by pitches, this paper rejects the notion that the increase in hit batsmen is a result of this retribution theory. A much simpler explanation will be presented and supported through analysis of the data.

INTRODUCTION

In 1973, Major League Baseball (MLB) introduced the Designated Hitter (DH) rule, and the American League (AL) adopted it. Rule 6.10 of Major League Baseball reads in part:

> A hitter may be designated to bat for the starting pitcher and all subsequent pitchers in any game without otherwise affecting the status of the pitcher(s) in the game. A Designated Hitter for the pitcher must be selected prior to the game and must be included in the lineup cards presented to the Umpire in Chief.

The rule goes on to state, among other things, that the DH is not a mandatory rule, meaning that a team could have its pitcher(s) bat if it so desires.

Over the last 30+ years, numerous individuals have written about the DH and its effect on the game of baseball, both positively and negatively. Many feel it has ruined the essence of the game, while others feel it has enhanced the offensive production and thereby made the game more fun to watch. A sampling of these arguments can be found by searching on "designated hitter" on any Internet search engine.

LEE A. FREEMAN is an assistant professor of MIS at the University of Michigan–Dearborn and a member of the Greenfield Village Lah-De-Dahs Base Ball Club. He lives in Canton, Michigan, awaiting a World Series victory by the Chicago Cubs.

HBP (Hit by Pitch)

Whatever one believes about the DH, examining the actual pitching and batting statistics should reveal how the DH rule has changed the game of baseball, if at all. In particular, these statistics show how the DH rule has changed the way pitchers in the two leagues pitch to batters. Goff et al. (1997) looked at these statistics from the perspective of moral hazard theory. They found that American League pitchers hit statistically more batters than their National League (NL) counterparts following the introduction of the DH rule in 1973. The authors concluded that there was a moral hazard in the AL as a result of the pitchers not batting and therefore not facing possible retribution for their actions. From an economic perspective, NL pitchers bear more of the costs of their actions.

Goff et al. analyzed Hit by Pitch (HBP) data through 1990, thereby using only 18 years of data with the DH rule in effect in the American League (1973-1990, inclusive). The authors stated that after controlling for at-bats, "American League batters have been hit by pitches at rates 10% to 15% higher than their National League counterparts in the typical post-DH season," (Goff et al., 1997, p. 555). This statement is based on "ballpark" (no pun intended) numbers of batters hit by pitches prior to the implementation of the DH, and the 10% to 15% increase is only a rough translation of the differences in the post-DH era.

A year later, two papers published in *Economic Inquiry* reported additional statistical analyses of the HBP data, mostly in response to Goff et al.'s (1997) paper. Trandel et al. (1998) offered a cost-benefit explanation for the differences in the two leagues' hit by pitch numbers. They argued that more batters are hit in the American League because there are more benefits to hitting a DH than hitting a pitcher, as the DH will likely do more damage offensively. Levitt (1998) agreed with this assessment, but only used data from 1993-1996. Goff et al. (1998) responded to these two papers stating that their analysis and interpretation was correct for the period of 1973-1990, and it still holds, for the most part, following 1990. In a follow-up article several years later, Trandel (2004) showed no significant retaliation effect in the HBP data, implying that neither Moral Hazard theory or Cost-Benefit theory holds.

Given the complexities of baseball, it seems unlikely that the increase in hit batsmen in the American League in the post-

DH era can solely be attributed to Goff et al.'s and Trandel et al.'s discussions of costs and retribution. Another causal factor for the increase in hit batsmen could be related to the number of "true hitters" faced by the pitchers in each league. While pitchers in the National League hit the occasional homerun and provide support in other ways to help their team offensively, most NL teams operate under the assumption that when facing a batting pitcher, the pitcher will strike out, sacrifice bunt, or get out in some other manner (ground ball to the infield, outfield fly, fielder's choice, etc.). These batting pitchers are not viewed in the same way by the opposition as a "true" ninth hitter in the line-up. However, in the AL, with the DH in effect, all nine batters in the line-up are "true hitters," and in many cases, the DH is one of the top hitters in many statistical categories (e.g., homeruns and RBIs) for his team and surely has a higher batting average than most, if not all, NL pitchers.

Perhaps the HBP statistics can be looked at a bit differently for proper comparison. Taking the moral hazard discussion one step further, not only would National League pitchers be less likely to hit a batter due to the potential retribution when his team and/or he is at the plate, NL pitchers would be even less likely to hit the opposing pitcher, as retribution would be practically guaranteed. Therefore, because American League pitchers face nine "true hitters" and National League pitchers face only eight "true hitters" (and would not want to hit the opposing pitcher anyway), perhaps the increase in AL hit batsmen is simply a result of more "true hitters" coming to bat. American League pitchers are not given the opportunity during the course of a game to "ease up" their delivery to the opposing pitcher. As a result, AL pitchers are likely to "want" or "need"

to pitch inside to more batters during the course of a game, thereby increasing the chances of these batters being hit by a pitch. Dave Smith of Retrosheet confirmed this assertion that NL pitchers are indeed hit by pitches much less often than their teammates, an argument made by Trandel (2004).

ANALYSES
All of the above necessitates a re-examination of the HBP data. Data were obtained from The Baseball Archive's Lahman Baseball Database. All database manipulations, sorting, analyses, and statistical tests were completed by the author. Data from the American and National Leagues from 1901-2002 were pulled from the database. The data included (for each year and each league): the number of batters hit by pitches, the number of teams playing, the number of hit by pitches for batting pitchers, and the total number of at bats.

FULL DATA
Figure 1 shows the number of HBPs in each year for each league. These numbers are the averages per team by controlling for the number of teams in the two leagues in any given year. At first glance, it seems that the two leagues are relatively the same—they have the same upward and downward trends over time; they have the same "spiked" years in 1911, 1981 (strike-shortened season), 1994 (strike-shortened season), and 2001; and they are both relatively close to the overall average. Following a general and slow downward trend from 1911-1947, there was a slight upward trend for the next 20 years, followed by a downward trend through the mid-1980s, culminating in a sharp upward trend over the last 17 seasons.

Figure 1. HBP (Average per team)
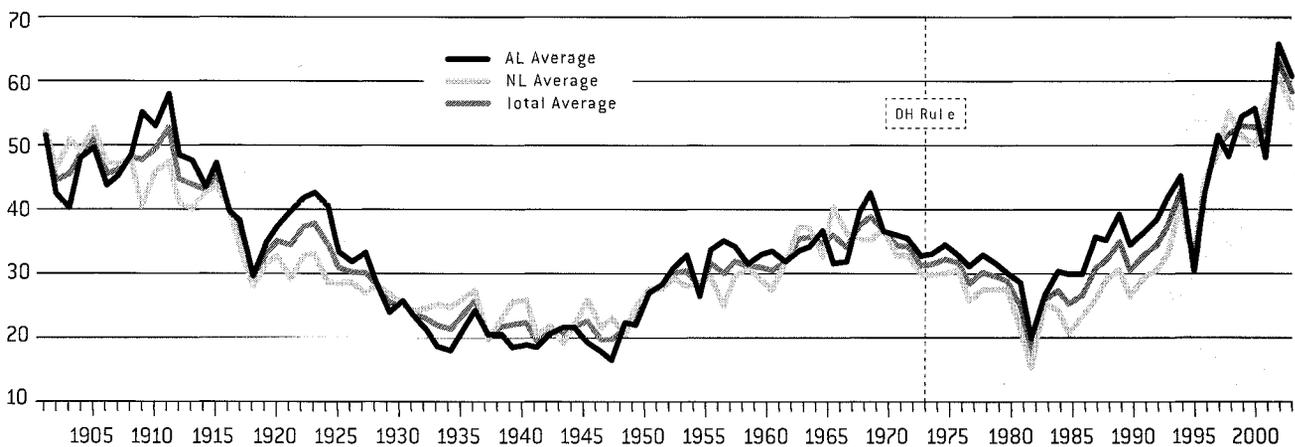
Figure 2. AL AvgHBP minus NL AvgHBP
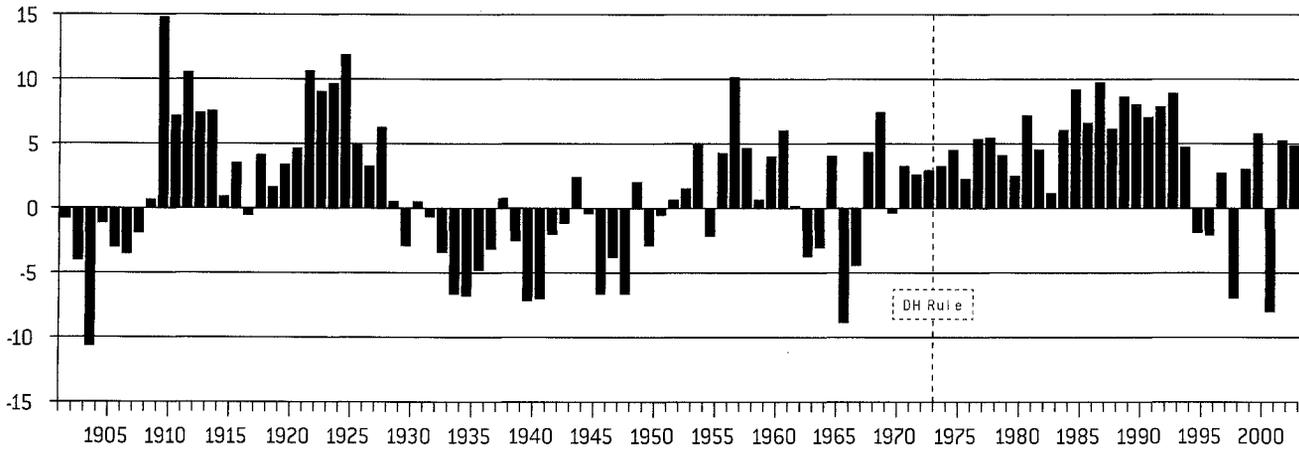
Looking at this same data from a different perspective yields more interesting results. If the National League average is subtracted from the American League average (AL AvgHBP– NL AvgHBP), the data result in the graph shown in Figure 2. There is a period in the early 1900s (1908-1928) where the AL AvgHBP is consistently higher than the NL AvgHBP. This is followed by a period (1929-1950) where the NL AvgHBP is consistently higher than the AL AvgHBP. From 1950 through 2002, except for a short period in the mid-1960s and again in the mid-1990s, the AL AvgHBP is once again consistently higher than the NL AvgHBP. From Figure 2, it appears that American League pitchers have been consistently hitting batters more often than their National League counterparts long before the implementation of the DH rule in 1973.

Table 1.

	All Years	72 Pre-DH	30 Pre-DH	Post-DH
AL HBP	355.28	282.28	280.53	530.50
NL HBP	328.96	272.99	271.57	463.30
Total HBP	684.25	555.26	552.10	993.80
AL AVG	34.85	33.33	30.37	38.52
NL AVG	32.91	32.32	29.62	36.55
Total AVG	33.92	32.82	29.99	36.55
DIFFERENCE	1.94	1.01	0.75	4.19

Table 1 provides the averages for the variables used in Figures 1 and 2 across four different time periods—the entire 102-year range, the 72 years prior to the DH (1901-1972), the 30 years prior to the DH (1943-1972), and the 30 years after the DH (1973-2002). The post-DH averages clearly show, especially when compared to the two different Pre DH time periods, a marked difference between the two leagues, both in pure numbers and in averages by team.

These data are further analyzed through a number of t-tests to determine the statistical significance (if any) of the differences between the two leagues over this 102-year period. The most common technique for analyzing differences between groups, t-tests create a statistic called the p-value that enables a comparison of the means between the groups. Specifically, the p-value shows "the probability of error associated with rejecting the hypothesis of no difference between the two categories of observations (corresponding to the groups) in the population when, in fact, the hypothesis is true" (StatSoft). In other words, as the p-value nears zero, we are able to be more certain of there being a difference between the groups. Generally, a p-value of 0.05 or less is considered to be statistically significant.

The t-tests in the first set (first column of Table 2) compare the years prior to the DH (1901-1972) to the years following the DH (1973-2002) by looking at individual variables one-at-a-time. The t-tests in the second set (second column of Table 2) compare the 30 years prior to the DH (1943-1972) to the years following the DH (1973-2002), also by looking at individual variables one-at-a-time. Table 2 shows the p-values from these t-tests.

Table 2.

	72 Pre-DH vs. Post-DH	30 Pre-DH vs. Post-DH
AL HBP	< 0.001	< 0.001
NL HBP	< 0.001	< 0.001
Total HBP	< 0.001	< 0.001
AL AVG	0.030	< 0.001
NL AVG	0.442	0.063
Total AVG	0.118	0.007
DIFFERENCE	0.002	0.003

These p-values indicate that following the introduction of the DH, there were significant differences in the total number of HBPs in the AL, the NL, and overall for both sets of comparisons. The top half of Table 1 shows these differences to be due to an increase in HBP in both leagues following the introduction of the DH. When examining averages across teams, thereby controlling for the number of teams in each year, the American League saw significant changes in both comparison sets, and the change was due to an increase as would be expected. The National League saw no statistically significant change across either comparison set at the 0.05 level, indicating that the DH did not affect the NL AvgHBP numbers, even though the numbers saw an increase as well.

The t-tests in the third set compare the AL AvgHBP with the NL AvgHBP across each of the four time periods. These t-tests are calculated as Paired Two Sample, i.e. looking at the two leagues' averages by comparing them on a year-by-year basis. Table 3 shows the p-values from these tests. These values indicate that prior to the DH rule, the HBP numbers for AL and NL batters were not significantly different. After the DH rule, the numbers are significantly different, with the AL having higher numbers than the NL, as would be expected and previously discussed. At this point, the analyses reveal nothing new with regard to previous writings and conclusions.

Table 3

ALL YEARS	72 Pre-DH	30 Pre-DH	Post-DH
< 0.001	0.110	0.359	< 0.001

"TRUE HITTERS" DATA

All of the above data are inclusive of every at bat in both leagues over 102 years. As mentioned before, with the DH in effect, American League teams send a lineup of nine "true hitters" to the plate, while National League teams send only eight "true hitters" to the plate. This is a 12.5% increase in the number of hitters from the National League to the American League. With more "true hitters" at the plate in the AL, more of them are likely to be hit by a pitch due to NL pitchers not wanting or needing to pitch inside to batting NL pitchers (i.e., wanting to pitch more aggressively to the best hitters). Therefore, the same analyses were re-run after the following adjustments were made to the AL AvgHBP and NL AvgHBP numbers from the previous section: for all 102 years of data, the NL AvgHBP is divided by 8—the number of "true hitters" batting in a game; for all years prior to the DH, the AL AvgHBP is divided by 8—the number of "true hitters" batting in a game; for the 30 years with the DH, the AL AvgHBP is divided by 9—the number of "true hitters" batting in AvgHBP is divided by 9—the number of "true hitters" batting in

a game as a result of the DH. In addition, all incidents of pitchers being hit by a pitch from both leagues were removed from the dataset in order to only look at data for non-pitchers.

These adjusted numbers show the averages per year per team in each league based on the number of "true hitters" appropriate to that particular league and year. Figure 3 is the same as Figure 2, but with the adjusted numbers.

Through 1972, the two figures show identical information (with different vertical axes) as both leagues batted 8 "true hitters" in each game. However, after 1973, 13 of the 30 years see more NL AvgHBPs than AL. In addition, for the last 10 years (1993-2002), the National League has more AvgHBPs in each year. During the same 30-year period in Figure 2, the National League had more AvgHBPs in only 4 of the 30 years. These numbers begin to tell a different story about HBP—namely, that the American League numbers may be higher simply because more "true hitters" come to the plate.

Tables 4-6 provide the same data and comparisons, with the adjusted data, as Tables 1-3 did with the original data. Table 4 provides the averages for the variables used in Figure 3 across the same four different time periods. As with Table 1 earlier, these numbers show marked increases in the number of HBPs in both leagues following the DH in 1973. However, unlike in Table 1, there is relatively no difference between the two leagues' averages in the post-DH era (right column). In fact, the NL AvgHBP is higher than the AL AvgHBP by 0.01.

Table 4

	All Years	72 Pre-DH vs. Post-DH	30 Pre-DH vs. Post-DH	Post DH
AL HBP	355.28	282.28	280.53	530.50
NL HBP	328.96	272.99	271.57	463.30
Total HBP	684.25	555.26	552.10	993.80
Adj. AL AVG	4.20	4.17	3.80	4.28
Adj. NL AVG	4.11	4.04	3.70	4.29
Difference	.085	.126	.094	-.012

Table 5 shows the same statistical tests as Table 2, but now with the "true hitters" data. The top half of Table 5 is identical to the top half of Table 2, merely indicating that, in each league, there was a significant increase in the number of HBPs. However, when looking at the averages per team, and when these numbers are adjusted for "true hitters," there are no significant differences in either league or in the difference between the leagues. While the raw numbers increased following the DH, the differences from that era to the time prior to the DH are not significantly different.

Figure 3. AL minus NL HBP Corrected for "True Hitters"
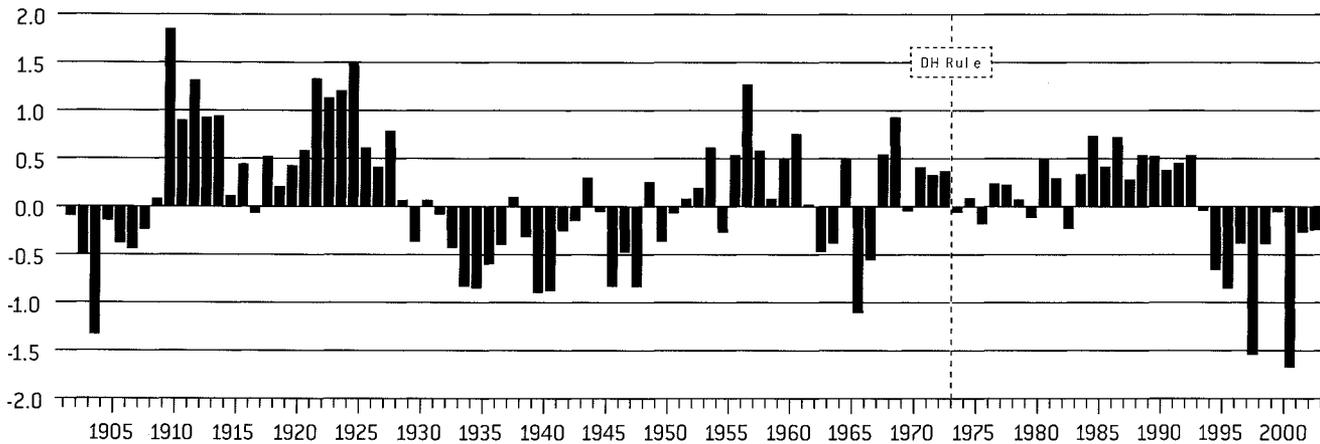
Table 5

	72 Pre-DH v. Post-DH	30 Pre-DH v. Post-DH
AL HBP	<.001	<.001
NL HBP	<.001	<.001
Total HBP	<.001	<.001
Adj. AL AVG	.672	.076
Adj. NL AVG	.422	.063
Difference	.300	.474

The t-tests in the third set compare the AL AvgHBP with the NL AvgHBP across each of the four time periods, as done previously with the original data. Table 6 shows the p-values from these tests. Here, too, there are no significant differences between the leagues during any of the four time periods.

Table 6

All Years	72 Pre DH	30 Pre DH	Post DH
.179	.110	.359	.912

Based on Figure 3 and Tables 4-6, the DH had no significant effect on the number of HBPs within or across leagues once the number of "true hitters" is accounted for. The analysis of "true hitters" provides a much simpler and cleaner explanation for the differences in HBP numbers across the leagues. It does not rely on any economic theories, but rests entirely in the mathematics of baseball and the number of batters faced in each game.

I should note limitations of these most recent analyses. First, by eliminating one of the batters from the line-up, the actual results of the games are skewed. Second, this type of analysis does not account for pinch hitters that likely enter the game in the late innings to bat for the pitcher (thereby increasing the actual number of "true hitters"), nor does it account for pitchers who have had above-average offensive ability (e.g.,

Mike Hampton and Rick Rhoden). However, pinch hitters consistently have lower batting averages than everyday hitters, so while they are more of an offensive force than a typical pitcher, they are less of one than an everyday player. Also, there have been too few pitchers with above-average offensive ability to warrant a change to any of the above analyses.

CONCLUSION

In the Post-DH era, American League teams send approximately 12.5% more "true hitters" to the plate in any given game. With an increase in the number of "true hitters" that a pitcher has to face, there should be an increase in the number of hit batsmen. The adjusted data show this is true and, more importantly, that the difference between the American and National Leagues is not significant (Table 6). Therefore, the increase in American League hit batsmen can be statistically explained by the extra "true hitters" in the game in the American League—12.2% increase compared to 12.5% extra hitters.

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Major League Baseball <www.mlb.com>

The Worst Team Ever?

At the end of 2003 season, national attention was focused on the Detroit Tigers as they attempted to avoid the ignominious label of becoming baseball's worst team ever since 1900. As the season closed, the Tigers were threatening to surpass the all-time games lost mark of 120 held by the famous 1962 "Amazin" Mets. Fortunately for Tiger fans, an end of the season winning spurt against the Minnesota Twins, who were resting many of their starters for the upcoming playoffs, avoided this destiny.

Throughout a good portion of the season, the Tigers record at multiple points in time was compared to that of the '62 Mets with the same equivalent games played. The Mets, managed by Casey Stengel, were in most cases held up as the standard for the all-time worst team. These '62 Mets are fondly remembered for their miscues by players such as "Marvelous" Marv Throneberry. Of his team, Casey Stengel was quoted as saying, "I have been in this game a hundred years, but I see new ways to lose I never knew existed before."[1]

In all of this, the major focus was on the number of games lost. However, as I watched the Tigers both in person and on television, I kept asking myself if I was really looking at the worst team to ever play the game in modern baseball history. In many of the games the Tigers seemed to be in the game with a chance to win until the end. All of the media focus was on the number of games lost. Were the Tigers really that bad? Were the 1962 Mets modern baseball's worst team ever? Are there other ways to compare teams besides games lost?

One obvious alternative is winning percentage. As the Mets vs. Tigers comparisons continued, little was made of the fact that the 1962 Mets played only 160 games with a .250 wining percentage. Were there teams with a lower winning percentage than the Mets? The answer is yes. Two teams actually had lower winning percentages than the Mets, the 1916 Athletics at .235 and the 1935 Braves at .248. Indeed there were five teams with lower percentages than the Tigers of this past season.

JERRY NECHAL is an administrator at Wayne State University in Detroit. In addition to SABR, he is a member of the Mayo Smith Society. He has been a loyal Tigers fan since the 1950s and the days of Charley "Paw Paw" Maxwell.

Figure 1. Ten Lowest All-Time Winning Percentages

1.	1916	Athletics	.235
6.	2003	Tigers	.265
2.	1935	Braves	.248
7.	1952	Pirates	.272
3.	1962	Mets	.250
8.	1942	Phillies	.275
4.	1904	Senators	.252
9.	1909	Senators	.276
5.	1919	Athletics	.257
10.	1941	Phillies	.279
	1932	Red Sox	.279
	1939	Browns	.279

Beyond games won and winning percentages, others have focused on the differential between runs scored and runs allowed as a measure of success or failure. G. Scott Thomas in his excellent book on adjusting baseball statistics, *Leveling The Field*, uses a historically adjusted differential of runs scored minus runs allowed.[2] This statistic is a key factor in his determination of the best and worst teams in baseball history. Likewise, David Surdam uses this runs differential to build a case that the 1966 Yankees were the best last-place team ever.[3]

A more precise determinant of how bad a team performs is this same runs scored versus runs allowed differential, but only for games lost. Beyond the sheer number of losses, the margin of those losses indicates how bad a team plays. My casual observation of the 2003 Tigers is that they were not by in large losing by big scores. A loss differential can be calculated by adding the losing margins for all the losses by a team in a season and then dividing that by the total number of losses. The 2003 Tigers lost 119 games with total losing margins in all those games equaling 448 runs. Thus, their loss differential is 448 divided by 119 or 3.76 runs per game.

However, before comparing loss differentials, some consideration needs to be given to the fact that various eras in baseball had significantly different numbers of runs scored. For example, in the National League in 1916 the average runs per game were 3.45 compared to 5.00 in 2000. It seems logical to adjust runs scored according to an index similar to what is done for the value of a dollar via the Consumer Price Index. In computing the loss differential for the eight teams with the lowest winning percentages from above, the American League

in 2003 was used as the benchmark. For each team an adjustment factor is calculated by dividing the 2003 American League average of runs scored per game (4.86) by average runs scored per game for the year in the league that the team played. For the '62 Mets, the National League average runs per game in that season was 4.48. By dividing the 2003 AL average by this 1962 NL average an adjustment factor of 1.08 is created. Multiplying this adjustment factor times the 3.65 average loss differential of the '62 Mets produces an adjusted loss differential of 3.96.

Figure 2. Comparative Adjusted Loss Differentials

	Loss Diff.	League Runs per Game	Adj. Factor	Adj. Loss Diff.
1916 Athletics	3.68	3.64	1.34	4.91
1935 Braves	3.63	4.71	1.03	3.75
1962 Mets	3.65	4.48	1.08	3.96
1904 Senators	3.66	3.54	1.37	5.03
1919 Athletics	3.58	4.09	1.19	4.25
2003 Tigers	3.76	4.86	1.00	3.76
1952 Pirates	3.59	4.17	1.17	4.18
1942 Phillies	3.66	3.90	1.25	4.56

In looking at these adjusted numbers, the 1904 Senators had the largest margin of loss at slightly over five runs per game. The 1916 Athletics were not far behind with an average losing margin of 4.91 runs per game. The 2003 Tigers ranked seventh out of the eight teams, only slightly above the 1935 Braves.

Beyond the number of runs a team loses by, how well a team plays the game is another measure of its skill or ineptitude. This includes the basics of hitting, pitching and fielding. I selected nine indicators of these basics. These include four for hitting, four for pitching, and one for fielding. The hitting basics are Batting Average, Total Runs Scored, On-Base Percentage, and Strikeouts. For pitching they are ERA, walks, strikeouts, and hits allowed. Finally, for Fielding the total number of errors for a season was selected. Next, in order to quantify a team's performance in each of these categories, numerical ratings were assigned based on a team's performance relative to the rest of the teams in the league. For each of these nine skills, the team's total results for the season were compared to those of the rest of the teams in their league for that same season. If a team had the poorest performance in the league in a particular
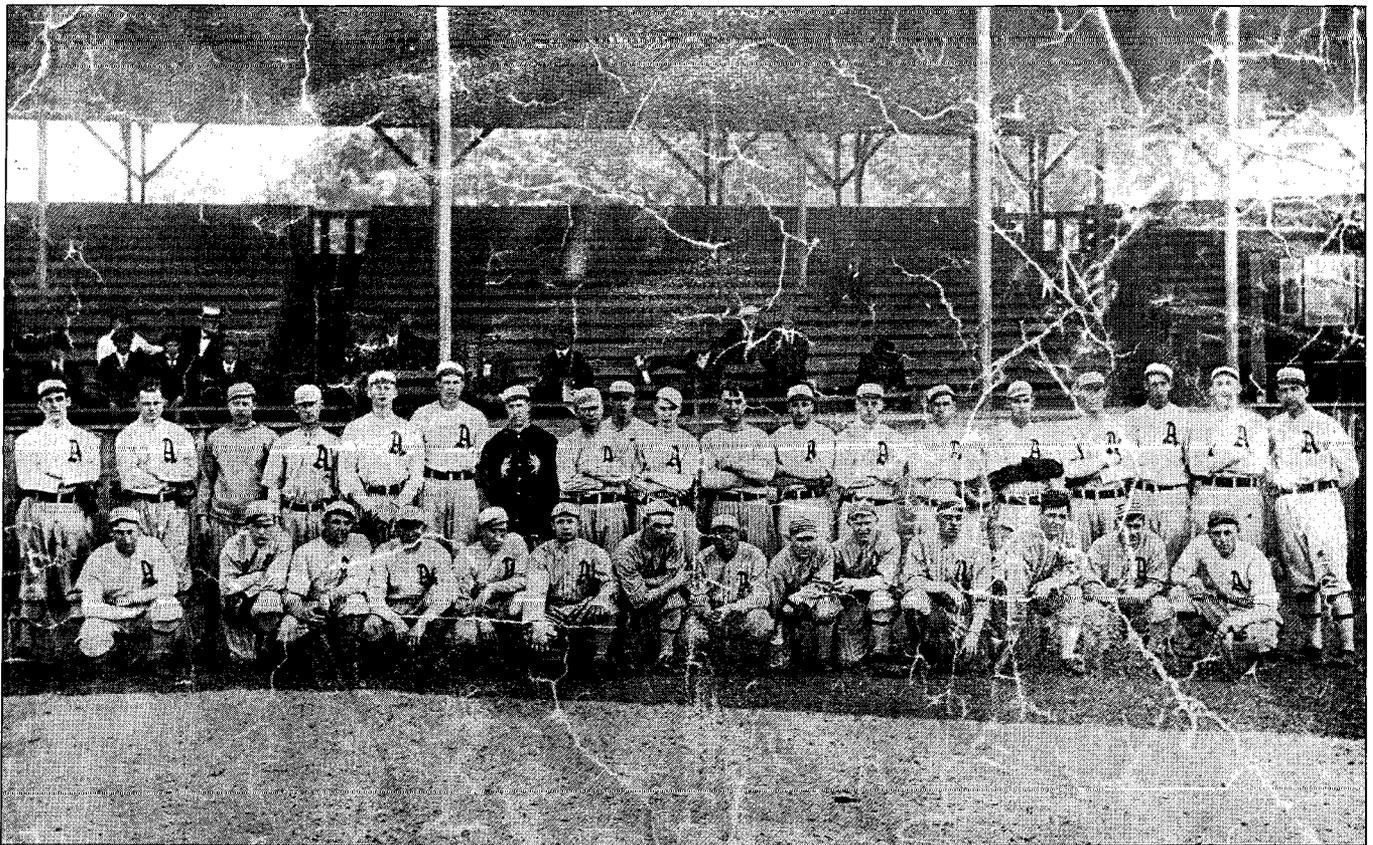
The 1916 Philadelphia Athletics. Top Row (L to R): Weaver, Strunk, Walsh, Stellbauer, Auldsworth, Parnham, Bush, Davis, Richardson, Crane, Lajoie, Morrisette, Wyckoff, Murphy, Bressler, Crowell, Nabors, Myers, Thomas. Bottom row (L to R): Meyer, Evans, Mellinger, Ray, Perkins, Thompson, Malone, Schang, McConnell, Witt, Pick, McInnis, Oldring, Sheehan.

category for that year, it is assigned a value of 1. If it was the next poorest performer, it was given a 2, and so on. Figure 3 compares the results for our same eight historical teams. Scores for all the skills are totaled and in this case, the lowest score indicates the poorest performer.

Figure 3. Team Batting, Pitching & Fielding Rankings

Team	BA	R	OBP	SO	ERA	BB	SO	H	E	Total
1916 Athletics	1	1	1	1	2	1	1	1	1	10
1935 Braves	1	1	1	8	1	5	1	2	3	23
1962 Mets	1	1	1	2	1	4	1	1	1	13
1904 Senators	1	1	1	1	1	3	1	1	1	11
1919 Athletics	1	1	1	1	1	1	3	1	1	11
2003 Tigers	1	1	1	1	2	4	1	2	1	14
1952 Pirates	1	1	1	1	1	1	1	1	1	9
1942 Phillies	2	1	1	7	1	1	3	3	1	20

At the first glance, the chart reveals that all of our teams by in large did not do very well in most categories. All eight teams have several scores of 1 for many categories. Not surprisingly teams that lose a lot of games have the poorest hitters, pitchers, and fielders in their league. Four of the teams are tightly clustered with total scores ranging from 9-11. However, the range of scores is from a low of 9 to a high of 23. The highest score comes from the 1935 Boston Braves who had the lowest scores in only five of the nine categories. The Braves batters were the least likely to strike out in the entire National League that year. The 1952 Pirates emerge in this comparison as the worst team with the lowest score. They are the only team to score a perfect one in all nine skills. Again the 1916 Athletics are near the bottom with the next lowest score of 10. The 2003 Tigers have a score of 14, which was bolstered by a pitching staff that finished last in only one of four pitching categories. Their anemic offense is evident with last places or scores of 1 in all four of the hitting categories.

So what is the worst team ever? In looking at all three of these comparisons, a strong case can be made that it is the 1916 Athletics, who were managed by Connie Mack. They are the only team to be at or next to the bottom in each of the categories. They lost 117 games out of 153 games played. This was three fewer losses than the most widely publicized worst team, the 1962 Mets. However, they have the all time lowest wining percentage, .235, and they narrowly missed having the largest loss differential and the lowest skills rating.

The 1916 Athletics were the result of Connie Mack dismantling a team that had won four pennants and three World Series between 1910 and 1914. Mack chose not to match the offers made to his players by the newly formed rival Federal League. Before the start of the 1915 season stars Eddie Plank, Chief Bender, and Jack Coombs were placed on waivers. Second

baseman Eddie Collins was sold to the White Sox. This was only beginning of the release of a litany of other players including Herb Pennock, "Home Run" Baker, and Bob Shawkey. By 1916, the Athletics were playing a shortstop recruited from a Vermont seminary, who made 78 errors for a team on its way to a season total of 312 errors. The team had two pitchers with a combined won and lost record of 2 and 37. One of these pitchers, Jack Nabors, lost 19 straight games. The Athletics finished 40 games behind the seventh-place Washington Senators.

As for the Tigers, Detroit fans can take some consolation that in each of the three methods of comparisons; there were at least five teams with lower performance than this past season's Tigers. Nevertheless, for most that is little consolation and winning more games is what everyone would like to see happen.

Notes

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Lawrence S. Ritter, the Last New York Giant

In the original preface to his classic work, *The Glory of Their Times*, Lawrence Ritter recalls reading the obituary of Sam Crawford's celebrated teammate Ty Cobb in 1961, and deciding "someone should do something, and do it quickly to record the remembrances of a sport that has played such a significant role in American life."

So began an odyssey of five summers, covering more than 75,000 miles throughout the United States and Canada, in search of those players whose legends had been born in the era of the "dead" ball. "They were not easy to find," Ritter wrote. "The teams they played for had lost track of them decades ago, and there was no central source of information."

Nonetheless, he found them. Some, like Lefty O'Doul, were easy to locate, while others, like Sam Crawford, were nearly impossible:

> I was told that Sam lived in Los Angeles, but when I arrived at the address, his wife, somewhat startled, said he hadn't been there for months. Sam didn't like big cities, she said, so she seldom saw him. Well, then, where could I find him? Oh, she couldn't tell me that; he'd be furious. Sam loved peace and quiet . . . and above all, he wanted privacy.
>
> After I pleaded for hours, Mrs. Crawford relented somewhat. She wouldn't tell me exactly where he was, but there was probably no harm in giving me "one small hint." If I drove north somewhere between 175 and 225 miles, I'd be "warm." Oh yes, she inadvertently dropped one more clue-Sam Crawford, the giant who once terrorized American League pitchers, enjoyed two things above all: tending his garden and watching the evening sun set over the Pacific Ocean.
>
> A long drive and inquiries at post offices, real estate agencies, and grocery stores placed me, two days later, in the small town of Baywood, California, halfway between Los Angeles and San Francisco. For the next two days, however, I made no further progress. On the evening of the fifth day,

DAVID LAWRENCE REED is a writer and sales trainer living in San Francisco, across town from SBC Park, the most-recent home of the team Lawrence Ritter once rooted for. Hailing from Dorchester, Massachusetts, David prefers to follow the exploits of his boyhood idols, the Boston Red Sox, from afar.

> frustrated and disappointed, I took some wash to the local Laundromat and disgustedly watched the clothes spin. Seated next to me was a tall, elderly gentleman reading a frayed paperback. Idly, I asked if he's ever heard of Sam Crawford, the old ballplayer.
>
> "'Well, I should certainly hope so,' he said, 'bein' as I'm him."

I encountered no such difficulties in locating Dr. Ritter; I was able to reach him after one phone call to his office at New York University and a second one to his home. To my delight, he agreed to be interviewed on the spot, and so, for the next half hour, we talked about the writing of *The Glory of Their Times* in particular, and about the art of oral history in general:

"I chose to write the interviews as narratives because I wanted to evoke a sense of the past from beginning to end. I don't like the question-and-answer format you frequently see in magazines, where the interviewer poses a question and the subject responds. They just don't flow. As to the lack of descriptive detail in the book, that was done deliberately. I don't think I lost very much—nothing important anyway—because I wanted to induce in the reader a mental image of the past. That's why, throughout the book, the only photographs I used were of the players as young men. In fact, if I had two equally good pictures, one of the player at twenty-five and another of him at thirty, I used the one at twenty-five.

"Usually, about ninety percent of the time, I was able to get all the material I needed. When I interviewed Lefty O'Doul, he only gave me an hour. I talked to him at his restaurant in San Francisco, and when the noon hour approached, we were interrupted, and he had to go. However, Lefty had this very rapid, staccato manner of speaking, so I got quite a bit in the one hour anyway.

"They weren't all that easy. Stanley Coveleski, for instance, was not a talker; most of the time, he answered in monosyllables. That's why his chapter is so short. And George Gibson, the old Pirate catcher: I talked to him for days and days, but most of what he said had already been told to me by Tommy Leach and Hans Lobert. I had a tough time getting anything I could use, and for that reason, his interview was excluded from the original book. I went back, though, ten or twelve years later, and

I saw material there that I could weave around into the short piece that appears in the new edition.

"The weaving process? Well, you know that quote in the preface, where I say, 'I asked, I listened, and the tape recorder did the rest?' That's a misstatement. Of course there was a lot of work that went into arranging the various elements. I had a typed manuscript of the conversations, and I would listen to the tapes I made—there are over a hundred hours of them—and after hearing them a few times, I would begin to hear the voice, its cadence, its peculiarities, so that I could recall its sound and character just by reading the transcript. Then I'd begin weaving the material into a narrative.

"I had no particular favorite among the interviews. All of these men became, in the course of our conversations, my friends; they were all enjoyable. Of course, some conversations were harder to get started than others. Chief Meyers, for example. The Chief resented white society, but once he accepted you, he was as warm and open an individual as you're ever likely to meet. He never forgot he was an Indian, and he made no bones about his resentment, but he wouldn't let that come between you.

"I didn't come to these interviews with any preconceived notions that I'm aware of. In fact, I didn't know what to expect. I had never really talked to old people before. My own grandparents had died before I was born, so I never met them. And as far as the players' reputations and all, I don't think that affected me. I've always thought, you know, that a baseball fan believes the game's heyday was during the time of his youth, between the ages of eight and eighteen. Ballplayers at that time of your life aren't life-size; they're giants, demigods. I think that's a fairly typical phenomenon. I was a big Bill Terry fan myself. I rooted for the New York Giants.

"And I deny any mythmaking in the cases of McGraw and Mathewson. These were strictly the players' points of view. Mathewson's legend was no doubt enhanced by his death as a result of World War I, but he was, by all accounts, a stellar individual. Rube Marquard said the worst thing anybody had to say about him. Now, I put in the book that Matty was a champion checker player. Marquard said Matty was also quite a gambler—cards and dice, but mainly cards—and he was terrific at that, too. They were all just gaga about him.

"Getting back to the matter of old people: I took away from these conversations a terrible fear of getting old. I enjoyed talking with these people. They were bright and very alive. But the more I saw of them, the more I realized how much physical pain they were in. They had reached a stage where their lives were more distressful than pleasurable. And these fellows made no bones about it: old age was hell. It was easily the worst part of their lives. They'd been champion athletes, used not only to getting around, but to getting around better than anyone else.

"Later on, my feelings were reinforced by the letters I received from the players' widows. Yes, I stayed in touch with all these men for a number of years afterward. I kept up our correspondence for business purposes, among other reasons. I had decided that since these were their life stories, told pretty much in their own words, that I would share my royalties with them equally. Anyway, whenever one of those fellows would die, I'd receive a letter that would usually relate the course of my friend's final illness. This always had a terrible impact on me.

"What other books on the subject do I like? I like Roger Angell's books and Tom Boswell's. I think Donald Honig's books are excellent, very well written. You might be interested to know that the book that was the inspiration for *The Glory of Their Times* wasn't a baseball book at all, but a collection of interviews with old jazz musicians that were written by Nat Hentoff. It was called *You Hear Me Talking to You*. I was also influenced by a collection of folk songs compiled by a man who worked for the Library of Congress. I believe his name was Lomax.[1] He traveled around the country interviewing old people about the songs their parents used to sing to them. I was very impressed with his work."

As the interview drew to a close, I thanked Dr. Ritter not only for his time and his insights, but also for the hours of pleasure his book had given me. I had read it during my late teens in the late sixties, and it had changed the way I looked at baseball. I told him that because of the preponderant number of interviews with ex-Giants, I, too, had become a New York Giants fan.

But the New York Giants are no more. Matty is gone, as are Marquard, McGinnity, and McGraw. Gone, too, are the stars that succeeded them: the Meal Ticket, Master Melvin, and Memphis Bill. The Polo Grounds were torn down nearly forty years ago, and now Lawrence Ritter, the last New York giant, has left us, leaving behind not only *The Glory of Their Times* and numerous other works that help baseball fans see into the past, but also the legacy of a life that will inspire the current and coming generations of oral historians to look after the future.

Notes
1. The Library of Congress was fortunate to have had not one but two members of the Lomax family, John and Alan, working to make the Archive of American Folk Song the most comprehensive collection extant. They co-authored *American Ballads and Folk Songs* (1934) and *Best-Loved American Folk Songs* (1947).

Ed. note: This interview was conducted in 1985 when Larry Ritter was a professor at NYU.

LEONARD NEWMAN & ESTHER FOLMAR

Hometown Heroes in the All-Star Game

Sandy Alomar Jr.'s career has been marred by frequent injuries, and one could argue that he has not lived up to the expectations most people had for him back when he was one of the most promising young catchers in the game. But no one was disappointed in him on the night of July 8, 1997. The American League's three-game losing streak in the All-Star game came to an end when Alomar, then of the Indians, hit a two-run homer in the seventh inning to power his team to a 3-1 victory. Alomar was voted the game's Most Valuable Player—and to top it all off, his moment of glory took place in Cleveland, in front of the home crowd at Jacobs Field.

Needless to say, not every All-Star game features such a memorable performance by a hometown player. But, Ron Kaplan, in a 1996 *Baseball Research Journal* article, suggested that standout performances by All-Stars playing at home are even less common than one would expect. He concluded that hometown batters have a decidedly "un-All-Star-like" record and that "pitchers have fared little better." For example, his calculations showed that through the 1995 season the aggregate batting average for hometown batters in the All-Star game was a not-very-impressive .238. The data presented by Kaplan are compelling because they seem to fly in the face of the well-known home field advantage in sports.[1] If teams and players generally turn in better performances than do visiting players, why should hometown players in baseball's All-Star game so frequently fall on their faces?

Kaplan's findings are not very intuitive—but if they are valid, they would not be without precedent. In fact, some people have suggested that "home chokes" like the ones that he might have documented in his paper are actually quite predictable in certain circumstances.

THE HOME CHOKE

Why do people choke under pressure? A series of studies con-

ducted by the social psychologist Roy Baumeister[2] supported the idea that situations that cause people to be extremely self-conscious can lead their performance in all sorts of skilled activities to deteriorate. Quite simply, focusing on what your performance will mean for how you feel about yourself and how others will see you wastes mental energy and redirects attention from where it should be properly focused.

The results of that research will probably not seem surprising to most readers, but it led to the prediction of a somewhat more surprising outcome. Baumeister and Andrew Steinhilber[3] studied seventh (and decisive) games played in the World Series and seventh games in National Basketball Association finals. They reasoned that the imminent prospect of becoming a world champion in front of a group of people that desperately wants that outcome—in their words, the possibility of "claiming a desired identity" in front of a supportive audience—could lead to very high levels of self-consciousness. That self-consciousness, of course, could lead to choking. Therefore, they predicted that having the home field "advantage" when one is on the verge of reaching an important and cherished goal could paradoxically cause one to perform worse than visiting players. In fact, an examination of the 1924 through 1982 World Series contests and 1967 through 1982 NBA finals showed that the home team was significantly more likely to lose than win the final game. The pressure and distraction caused by the supportive hometown fans also seem to have led to more home team fielding errors and more missed free throws in the decisive seventh games.

This research is not without its critics,[4] and the home choke in the World Series has been notable only in its absence in the last 20 years or so. But the general effect has been replicated in other sports, such as Stanley Cup hockey and professional golf.[5]

A HOME CHOKE IN THE ALL-STAR GAME?

Could poor performance by hometown players in baseball's All-Star game be another example of the home choke? After all, other than world champion, what could be a more "desired identity" for a baseball player than being an All-Star? Could the self-consciousness caused by the pressure of having to live up to that label in front of a large group of people who expect and

LEONARD NEWMAN is a social psychologist and an Associate professor at the University of Illinois at Chicago. He started following baseball as an 8-year-old on Long Island during the Mets' 1969 "miracle season," but for reasons that escape him now, he was a Washington Senators fan at the time. **ESTHER FOLMAR** is a 2000 graduate in Psychology of the University of Illinois at Chicago.

desire you to do so lead to the kind of choking that Baumeister and his colleagues have found in their research? It is difficult to say, because the .238 batting average for hometown All-Stars is a stand-alone statistic. It cannot be interpreted without reference to some standard of comparison or control group. Fortunately, a comparison group is readily available: visiting players. The purpose of this study was to determine whether the performance of hometown players in All-Star games—in particular, their overall batting average—is indeed "un-All-Star-like." That is, the goal was to see if their hitting is particularly poor in the context of baseline levels of performance in the All-Star game.

METHOD AND RESULTS

All-Star game box scores from 1933 through 2000 were examined. Box scores through 1986 were available in Lenberg's *Baseball's All-Star Game: A Game-by-Game Guide* (although a few errors in team affiliations were detected and corrected); the rest were gathered from newspaper reports. The number of at-bats and hits for each player appearing in those games was recorded, as was his status as a hometown or visiting player. Overall, hometown players came to the plate 422 times and were credited with 102 hits for a .242 batting average. The comparable numbers for visitors are 4,470 at-bats, 1,100 hits, and a .246 average. If we exclude pitchers, as Kaplan generally did,[6] both of these averages (not surprisingly) increase. Hometown position players have hit for a .244 average in the All-Star game (100 for 409), while the visitors' batting average is .250 (1,083 for 4,334).

Overall, hometown players through the year 2000 were slightly less likely to hit safely than were visitors, but the difference is very small and not even close to being statistically significant when examined with a chi-square test (the appropriate test for comparing the frequencies of events). In addition, if one redefines hometown players as being only those playing in their team's actual home park (e.g., a New York Giant playing in the Polo Grounds or a member of the Red Sox playing in Fenway), the difference between them and the visitors almost entirely disappears (.245 for hometown players vs. .246 for visitors, all players; .251 vs. .249 excluding pitchers).

An alternative analysis in which only a player's first All-Star game appearance was counted was also run. Arguably, this is a more appropriate approach for testing for the home choke, because the first appearance is when a player would first be assuming his new identity as an All-Star, and the point at which he might feel the most pressure to prove that he was worthy of that title. In addition, it would help control for the possibility that individual players might be having a disproportionate influence

on the results; for example, Hank Aaron appeared in 23 All-Star games as a visitor (and only once as a hometown player). Finally, restricting the analysis to first-time players yields data that are closer to meeting the formal assumptions of a chi-square test (in particular, the independence of observations). This approach, however, did not result in a very different pattern of results. Thirty-two hits have been recorded for hometown players in their first All-Star games, and those players came to bat 142 times. Visitors in this category came to bat 1,095 times and got 244 hits. The resulting batting averages, .225 vs. .223, are nearly the same. If pitchers are included, the gap widens (34 hits, 149 at-bats, a .228 average for hometown players; 254 hits, 1,172 at-bats, a .217 average for visitors), but the difference is not even close to being statistically significant. That should not be surprising; if the hometown players had hit safely just two fewer times, their average would be even lower than the visitors'.

It should also not be surprising that (as readers have no doubt already noticed) when only first-time players are included, the batting averages sink. The group of first-timers includes a higher proportion of players who appeared only once in the All-Star game, like Richie Scheinblum and Billy Grabarkewitz—although Billy did just fine in 1970, getting a key hit in the 12th-inning rally that led up to Pete Rose scoring the winning run with his notorious slide into Ray Fosse.

SUMMARY AND CONCLUSIONS

In conclusion, when hometown players' All-Star game performances are evaluated with a proper baseline, there is nothing particularly "un-All-Star-like" about them. They have just as much success at the plate as do the visiting players. Of course, batting averages of the kind reported in this paper are quite low for a group of hitters that includes a disproportionate number of Hall of Famers, but one must keep in mind that All-Star games also feature the very best pitchers! If batters (like American Leaguers in the 1966 All-Star game) had to face Sandy Koufax, Jim Bunning, Juan Marichal, and Gaylord Perry in every contest, there would be few if any .300 hitters in baseball history.

It is unclear why there was no evidence for a home choke in the particular situation studied here. As already noted, other researchers have occasionally reported difficulty replicating Baumeister and colleagues' findings, and the variables that either enhance or undermine the effect are poorly understood.

Even if results consistent with the home choke hypothesis had been found in this study, a compelling alternative explanation would have to be ruled out. It is possible that All-Star team managers, out of a desire (conscious or unconscious) to

please the fans who will actually be in attendance at the game, adopt less stringent criteria when choosing players from among the host team's players. If such a bias in fact existed, one would expect hometown players for that reason alone to generally turn in poorer performances. After all, if they are not as good as the average visitor to begin with, then why would we expect them to play as well in the All-Star game? The fact that no such difference was found suggests that if anything, hometown players might be turning in even better performances than might otherwise be expected.

Either way, the evidence is fairly clear. A hometown player in the All-Star game is just as likely to be left with memories as pleasant as those of Sandy Alomar Jr. in 1997 or Ted Williams in 1946 (4 for 4 with two home runs at Fenway) as he is to have to deal with the nightmare that was Pee Wee Reese's 1949 appearance (0 for 5 with a crucial error at Ebbets Field). Hometown heroes in the All-Star game have nothing in particular to fear.

Notes

1. See, for example, Schwartz, B., & Barsky, S. F., "The home advantage," *Social Forces*, vol. 55, 1977, 641-661, and Courneya, K. S., & Carron, A. V., "Effects of travel and length of home stand/road trip on the home advantage," *Journal of Sport and Exercise Psychology*, 1991, vol. 13, 42-49.
2. Baumeister, R. F. "Choking under pressure: Self-consciousness and paradoxical effects of incentives on skillful performance" *Journal of Personality and Social Psychology*, vol 46, 610-620.
3. Baumeister, R. F., and Steinhilber, A. "Paradoxical effects of supportive audiences on performance under pressure: The home field disadvantage in sports championships," *Journal of Personality and Social Psychology*, vol. 47, 85-93.
4. Schlenker, B. R., Phillips, S. T., Boniecki, K. A., & Schlenker, D. R. "Championship pressures: Choking or triumphing in one's territory?" *Journal of Personality and Social Psychology*, vol. 68, 1995, 632-643.
5. Wright, E. F., Jackson, W., Christie, S. D., McGuire, G. R., & Wright, R. D., "The home-course disadvantage in golf championships: Further evidence for the undermining effect of supportive audiences on performance under pressure," *Journal of Sport Behavior*, vol. 14, 1991, 51-60, and Wright, E. F., Voyer, D., Wright, R. D., & Roney, C., "Supporting audiences and performance under pressure: The home-ice disadvantage in hockey championships," *Journal of Sport Behavior*, vol. 18, 1995, 21-28.
6. Kaplan excluded pitchers from his calculations, with three unexplained exceptions. In addition, a recomputation of the batting average for hometown players using the numbers presented in his table resulted in a figure of .242 (91 hits out of 376 at-bats), not .238. Finally, he inadvertently excluded three hometown players from 1934 (Ben Chapman, Al Lopez, and Travis Jackson), four from 1964 (Elston Howard, Mickey Mantle, Joe Pepitone, and Bobby Richardson), one from 1971 (Norm Cash), and one from 1977 (John Stearns). Excluding all pitchers, the actual hometown All-Star batting average for 1933 to 1995 is still quite comparable to Kaplan's figure (94 for 402, .234).

The Science of Second Guessing

The Cases of Stengel, Mauch, and McNamara

New York Giants owner Andrew Freedman fired 13 managers between 1895 and 1902. He wasn't the first to second-guess the actions of a manager, though he did help establish a time-honored tradition. In the years since, more than a few reputations and careers have suffered the ill-effects of the practice.

Fans, owners, and journalists rightly reserve the right to scrutinize managerial decisions. With that right, however, comes a responsibility for fairness and accuracy in drawing conclusions. This article outlines a systematic approach to second-guessing managerial decisions, and applies it to three controversial historical cases, centering on decisions made by managers Casey Stengel, Gene Mauch and John McNamara. The review illuminates discrepancies between popular accounts and the real impacts of the managers' actions.

The process consists of four steps:

1. Assessment of the Context

What information did the manager have at the time of the decision and what were his objectives at that time?

The process of second-guessing often misfires at this stage, projecting knowledge of an eventual outcome backward through time into the mind of a manager. Accurate assessment of the context of a decision is fundamental to unbiased analysis.

2. Establishment of Alternatives

What were the manager's options at that time?

Systematically laying out realistic alternatives available to the manager provides a structure for determining a decision's soundness.

3. Estimation of Probabilities of Outcomes

What were the possible outcomes of each alternative, and what were their relative probabilities?

In most cases probabilities can be estimated based on available information, such as past performance,

SCOTT SCHAFFER was born eight blocks from Forbes Field during the pennant race of 1960. He writes on economics, social issues and sports history from Port Angeles, Washington.

known expectations, or intuitive reasoning applied to less quantifiable elements of a situation. This process can shed light on a manager's choices, focus the observer on the essence of a decision and, often, neutralize or contradict conclusions based on gut feelings.

4. Comparison of Alternate Paths

Did an alternative the manager did *not* pursue have a substantial likelihood of a better outcome than the path he chose?

If so, criticism is fair game. If not, including cases in which the relative outcomes are unclear or indistinguishable, censure of a manager is unjustified. The burden of proof is on the second-guesser (much as guilt must be established beyond doubt in the legal system).

While baseball is the most quantifiable of sports, it consists of much more than numbers. Intangible factors often play important roles in decision making. These factors are best introduced after all quantifiable elements are assessed. Intangibles may reinforce the figures, contradict them, or merely fail to overrule the numbers.

Applying this process to three real events, we can check how well popular assessments of managers' decisions hold up under scrutiny.

CASEY STENGEL AND THE 1960 YANKEES

Casey Stengel managed the Yankees from 1949 through 1960, overseeing ten pennants and seven world championships. His final act with the team was Game Seven of the 1960 World Series. The favored Yankees lost 10-9 to the Pirates in the game's last at-bat. Most explanations of New York's shocking defeat focused on a single play: In the eighth inning, Pittsburgh's Bill Virdon hit a would-be double-play grounder that ricocheted wildly and struck Yankee shortstop Tony Kubek in the throat, keeping a Pirate rally alive. Several managing decisions seemed worthy of controversy, but Stengel proved to be virtually immune from public criticism immediately after the Series (though the team's ownership saw fit to relieve him of his duties just five days later).[1]

In subsequent years, and notably after Stengel's death,

dissent emerged. Mickey Mantle and others suggested that it was not the Kubek grounder but rather the Yankee manager who lost the Series—by failing to start Whitey Ford in Game One. Ford was one of the premier pitchers of his day (as well as Mantle's close friend), and threw complete-game shutouts in Games Three and Six. If Ford had started Game One, the argument goes, he would have been available in Game Four and Game Seven, if necessary, and the Yankees could have avoided the disastrous finale. A popular book, *The Mad Dog 100: The Greatest Sports Arguments of All Time*, by Christopher Russo with Allen St. John, repeats this contention, calling the failure to start Ford three times "mind-boggling."

Applying the four-step process, we can test the validity of this case against Casey:

First, we need to assess the context of the decision. Game One was to be played in Pittsburgh. The Pirates were a mixture of talented young players and salvaged veterans with negligible post-season experience. Published odds on the Series were 7-5 in favor of the Yankees, who had won their last 15 games and were comfortable under the World Series spotlight. The Yankees were 1-4 in first games of the past five World Series they had ultimately won; Game One had not been crucial to the team's past success.

Stengel had two valid options for a Game One starting pitcher. Alternative (a) was Ford, who had compiled 133 victories, a .693 winning percentage, and six All-Star appearances in nine seasons with New York. He had a 5-4 record and a 2.81 ERA in 12 previous Series starts. All five of those wins had come in Yankee Stadium. Ford spent time on the disabled list with a sore shoulder earlier in the year and, with just 12 victories, 1960 was among his poorer seasons. Ford was a left hander, and the Pirates' leading batter and top three power hitters batted right.[2] Alternative (b) was Art Ditmar, a right hander with 70 victories and a .511 winning percentage in seven seasons with the Yankees and Athletics. Despite a modest past, he led Yankees starters in victories, innings pitched, and ERA in 1960. Ditmar had appeared in three past World Series games, all in relief, and had a perfect ERA. Stengel credited him with staying low in the strike zone and forcing ground balls, an advantage against the reputedly high ball–hitting Pirates.

Based on the facts available to Stengel, the two alternatives carried a similar probability of success in Game One. The line on that game was even with either pitcher on the mound; oddsmakers made no distinction. We might assume a 50% probability of a Game One victory, within a range of, say, 45-55%, but since there is no basis for differential between the two pitchers, no estimation is needed.

With little to choose between the options so far, we can consider the implications of Stengel's Game One decision later in the Series—the intangibles. Ford had greater experience and could offer more relative benefit at critical junctures, for example, when one or both teams would face the pressure of impending elimination. It's not clear that Ford would have been available to start three times in the Series. Note that Stengel started Ford three times in the 1958 Series, with poor results; though New York prevailed, Ford did not win a game and complied a 4.11 ERA.[3] Assuming, as Stengel apparently did, that Ford would be available to start just two games in the Series, his relative benefit was greater the deeper in the Series those two starts occurred, particularly if one of the starts came in Yankee Stadium (in Games Three, Four, or Five), where the dimensions favor left-handed batters and pitchers. Ditmar, by comparison, lacked Ford's post-season experience and would therefore have greater relative value earlier in the Series.

On balance, this analysis tilts the advantage to alternative (a) and supports Stengel's selection of Ditmar in Game One. As fate would have it, the Pirates knocked him out in the first inning en route to a 6-4 victory. Ford nonetheless proved the wisdom of his assigned role by posting convincing victories at key points in the Series.

While Stengel does not deserve criticism for his Game One choice, careful analysis raises flags on several later decisions—for example, starting Ditmar a second time in Game Five, and several moves in Game Seven. Ironically, the manager flew under the radar with questionable judgment that post-season, but couldn't escape heat for a prudent decision.

GENE MAUCH AND THE 1964 PHILLIES

Few managers have faced the sustained criticism that Gene Mauch has fielded for his role in the late-season collapse of the 1964 Phillies. The team held a 6½-game lead in the standings with 12 games to go, but proceeded to drop ten in a row and finished in second place, a game behind the Cardinals. Mauch's most criticized decision is his use of starters Jim Bunning and Chris Short on two days' rest as the season wound down. In *October 1964*, David Halberstam says, "The question is the obvious one: with a lead that big, why not concede a game or two and come back with a rested pitcher and end the streak." *Philadelphia Inquirer* reporter Allen Lewis offered a scathing rebuke of the manager's pitching choices as the season ended, and such censure has entered baseball folklore. Russo and St. John repeat the charges in *The Mad Dog 100*, chiding Mauch's "overmanaging."

The reality was not so simple. Mauch had reasons to feel

Table 1. **Estimated Probability of Effectiveness**
Phillies Starting Pitchers, September 1964

Pitcher	Full-Strength	Adjusted
Bennett	48%	36%
Bunning	75%	56%
Mahaffey	57%	43%
Short	67%	50%
Wise	n/a	30%

Full-strength probability based on seasonal winning percentage on September 25. Adjustments compensate for short rest (Bunning, Short), arm trouble (Bennett), unusually high ERA (Mahaffey), and inexperience/ few data points (Wise).

Source: *Philadelphia Evening Bulletin*

Table 2. **Comparative Probability Analysis of Outcomes**
Mauch's Pitching Rotation Choices, Sept. 25-30, 1964
average probability of effectiveness

Var.	Description	Rotation Alternative		
		(a)	(b1)	(b2)
1	All rated at full strength	59%	62%	65%
2	Adjust Bunning	59%	59%	59%
3	Adjust Bunning, Short	59%	53%	53%
4	Adjust Bunning, Mahaffey	54%	54%	56%
5	Adjust Bunning, Short, Mahaffey	54%	48%	51%
6	Adjust Bunning, Bennett, Mahaffey	54%	52%	54%
7	Adjust all	54%	46%	49%

Alternative (a): Mahaffey-Short-Wise-Bunning-Mahaffey-Short
Alternative (b1): Short-Mahaffey-Bunning-Short-Bennett-Mahaffey
Alternative (b2): Short-Mahaffey-Bunning-Short-Bennett-Bunning
Bunning, Short adjustments applied to (b1)/(b2) for starts on two days rest. Other adjustments applicable to all starts.

good as his team started a home stand on September 21. Philadelphia was making plans for the World Series and bathing the team in adulation. Mauch nonetheless knew that celebration was premature. He was specifically concerned about the state of his starting pitching, which was strong at the top with all-stars Bunning and Short, but otherwise decimated by injuries. Elbow problems had sidelined Ray Culp since mid-August, and a sore arm plagued Dennis Bennett. Journeyman Art Mahaffey and struggling rookie Rick Wise, eight days past his 19th birthday, were Mauch's only other starters. Veteran Bobby Shantz had experience as both a starter and reliever, but he hadn't started a game in nearly three seasons, and Mauch believed his services necessary in the bullpen, which also had little depth.

With ten games in ten days, Mauch's options were limited. He stuck with his basic four-man rotation for the first four games; Mahaffey, Short, Bennett, and Bunning lost in succession as the Phillies' lead dwindled to three games.[4] At this point Bennett was unable to throw and could be ready, at the earliest, after five days' rest. Mauch's alternatives for the next six games were essentially (a) Mahaffey-Short-Wise-Bunning-Mahaffey-Short, or (b) a variation that would avoid the need to use Wise, who had started just eight games in his brief career. The latter would require using at least two of Mauch's other starters on two days' rest, a rare practice considered risky. (Mauch had tried this with Bunning earlier in the month, with poor results.) Ruling out the use of Mahaffey on short rest, something Mauch did not consider, there were only two possible sequences under this plan, with the sole difference being in the final game. Sequence (b1) is Short-Mahaffey-Bunning-Short-Bennett-Mahaffey; (b2) substitutes Bunning for Mahaffey at the end.

We can estimate the probabilities of success for these variations by using each pitcher's winning percentage as a predictor of the likelihood of a victory-worthy outing, summarized in Table 1. Given the small number of data points for Wise, as well as his inexperience, his value is estimated at .3. We can compute the relative values of each sequence and test different assumptions in the process.

Table 2 summarizes seven different variations of probability strings for the six games, expressed as a per-game average. The first assumes that all pitchers were working at full strength, regardless of rest between starts. The second adjusts Bunning to 75% effectiveness when working on two days' rest (based on an earlier observation), and the third does the same for both Bunning and Short.[5] The remaining four variations assume different combinations of adjustments, adding to the mix Mahaffey (his 4.52 ERA was a full run per game

above the league average, a reflection of erratic performance) and Bennett, due to his physical problems. The figures reveal a conundrum: alternative (a), the one favored by second-guessers, is superior in three variations. But alternative (b2) is superior in two variations, and the remaining two are virtual ties. The outcome depends on the chosen assumptions, and in no case is the discrepancy greater than six percentage points.

It's logical to assume that Bunning and Short would be less effective than usual on two days' rest, but how critical is the 75% estimate? If the same variations are run with Bunning and Short adjusted to 88% or greater effectiveness on two days' rest, all lean to alternative (b2). If the adjustments applied to Bunning and Short are valued at less than 67%, all variations tilt toward alternative (a). This tells us that if it was reasonable to assume at least two-thirds effectiveness for the two pitchers throwing on short rest (i.e., a probability range of, say, 67-85%), one or more scenarios justified their use in this way.

Next, we examine the intangibles. Mauch wasn't working in an abstract statistical model in which each game was equal. After losing four straight at home, the Phillies and their fans were experiencing a crisis of confidence. Mauch felt that the next contest was critical to restoring order. His selection of his left-handed stopper, Short (2.20 ERA), over inconsistent Mahaffey had logic behind it. In addition, alternative (a) would, in the worst case, have placed Wise in front of an increasingly irritable crowd under unimaginable pressure—the final home game of the season, with a dead heat in the standings. The (b) alternatives, by contrast, had veteran Bunning on the mound that day. These facts complement the bare figures and offer support for the manager's strategy as a reasonable one; the evidence thus justifies Mauch's starting pitching decisions, in contrast with popular legend.

Mauch chose alternative (b2), with unhappy results in the won-lost column. For the record, however, Short actually pitched *better* on two days' rest than on longer rest over the last two weeks of the season (2.84 vs. 5.50 ERA), suggesting that Mauch's strategy may not only have been rationally conceived, but also most beneficial to his team.

JOHN MCNAMARA AND THE 1986 RED SOX

The third case is that of John McNamara, eternally associated with the demise of the 1986 Red Sox, who lost after pulling within one strike of the championship. McNamara was a lightning rod for criticism afterward, notably for failing to remove Bill Buckner late in Game Six of the World Series. Buckner's 10th inning error that night became a fixture on highlight reels. *The Mad Dog 100* ranks McNamara's moves that year "the biggest managerial blunders in baseball history." Let's see if the ana-

lytic process can vindicate the embattled Boston manager or give the Mad Dog an elusive endorsement.

McNamara had multiple opportunities to remove Buckner from the game, and in fact had done so in each of Boston's seven post-season wins that year. Buckner was a premier offensive player of his era, and a steady first baseman. Chronic ankle problems had sharply curtailed his range in the field, however, leading the manager to substitute defensive specialist Dave Stapleton when the team was ahead in late innings. The first such opportunity in Game Six came in the top of the eighth inning. The Red Sox led the Mets 3-2 and batted with the bases loaded and two outs. Left-hander Jesse Orosco was pitching for New York. Boston designated hitter Don Baylor—on the bench because the DH was not used in the National League city's home games—was available to pinch-hit.

The manager had two alternatives at this point: (a) use right-handed Baylor to bat for left-handed Buckner, and then insert Stapleton at first base, or (b) allow Buckner to bat. Alternative (b) would allow the possibility of replacing Buckner with Stapleton at any point afterward, as well as using Baylor at a later point, if needed.

In assessing probabilities of success, we have a wealth of information, as did McNamara. Assuming that the objective for the upcoming at-bat was to get at least one insurance-run, the batter would need to safely reach base by any means. On-base percentage (OBP) is therefore the critical offensive statistic. We can combine the pitcher's and hitters' relative strengths in weighted OBP values, summarized in Table 3.

Table 3. Estimating Probability of Success Baylor or Buckner vs. Orosco, 1986 Game Six

	OBP
Baylor vs. LHP	.359
Orosco vs. RHB	.325
Baylor-Orosco Weighted*	.342
Buckner vs. LHP	.257
Orosco vs. LHB	.235
Buckner-Orosco Weighted*	.246
Differential	.096

*The mean of the batter's OBP and the pitcher's allowed OBP. Regular season figures for 1986.

Baylor's weighted OBP is much higher, .342 vs. .246, because he was more effective than Buckner against lefties, while Orosco had significantly greater success against left-handed batters. Baylor's odds of producing a run were, by this

predictor, close to 10 percentage points better than Buckner's. Comparing the two figures directly, Baylor had a 39% greater chance of success than did Buckner in this situation. Further, Buckner had slumped badly in the post-season, with a .213 OBP, compared to Baylor's .422.[6] Orosco, for his part, was nearly perfect against lefties in recent weeks, allowing one base-runner in 18 post-season at-bats.[7] These figures suggest that the actual differential between the two batters might have been larger yet.

This example shows how the analytic method can help reduce a decision to its essence and focus debate. To justify leaving Buckner in the game in this situation, McNamara had to conclude that a 10 percentage-point improvement in the chance of scoring was not worth the loss of Baylor as a potential pinch-hitter in an unknown future situation. Given that Baylor's weighted OBP against Orosco was higher than the OBP of 25 of the 26 major league teams in 1986, while Buckner's weighted OBP was just 80% of that of the *lowest*-ranked major league team, the evidence provides strong support for the pro-Baylor position. McNamara's decision to let Buckner bat does not hold up to scrutiny.

But was his managing the *worst ever*? Failure to insert Baylor may have been a poor choice, but given that Buckner had 102 RBI that season, it would not seem to be of vintage caliber. Similarly, leaving Stapleton on the bench with a two-run lead in the bottom of the tenth may have been unwise, but comparison of Stapleton's and Buckner's career fielding percentages at first base (.993 vs. .992) would hardly have predicted the famous error.[8] McNamara's unpopular removal of Roger Clemens after seven innings of Game Six was a third controversial decision. This choice was informed by a worsening blister on the pitcher's hand, and otherwise bears close resemblance to a move another Boston manager was crucified for *not* making 17 years later. Upon careful review, McNamara's detractors have not justified the degree of their vitriol.

CONCLUSIONS

These case studies demonstrate how conventional understanding of the actions of managers can be mistaken as a result of inadequate or skewed assessment of facts. Systematic analysis shows that commonly held grievances with Casey Stengel and Gene Mauch are unjustified. A specific criticism of John McNamara is validated, though the overall case against the manager has been exaggerated. On the whole, the positions of these and other managers in baseball history have been dictated more by reflexive reactions than by careful analysis.

Applied to the practice of second-guessing, the process described here can help lead to more accurate and fair evalua-

tion of managers, stir deeper debate on baseball controversies, and help fans hold journalists to a higher standard of reporting and commentary.

Notes

1. Rumors of Stengel's impending termination circulated during the Series, and concern for the popular manager's fate may have blunted criticism of his role in the Yankees' defeat.
2. Dick Groat won the 1960 NL batting title with a .325 average. Dick Stuart (23), Roberto Clemente (16), and Don Hoak (16) led the Bucs in homers.
3. Ford earned Game One victories in the 1961 and 1962 World Series, both of which the Yankees won. At the time of this decision, however, Stengel's information on both Ford's post-season performance and the correlation between Game One outcome and Series outcome were very different. Latter-day critiques seem to presume Stengel knew of Ford's *future* post-season stardom in 1960.
4. Halberstam and others have misunderstood the timing of events in linking Mauch's use of Bunning and Short to the Phillies' collapse. The "big" lead Halberstram referred to had in fact dwindled to less than half of its September 21 level before Mauch first used Short on two days' rest.
5. While Bunning had started once on two days' rest, Short had not; his tolerance of this condition was unknown.
6. Baylor was a 1986 post-season hero, having saved the Red Sox's season with a home run to help prevent elimination in the ALCS.
7. Since post-season statistics are based on a small number of data points, I consider them as intangibles, which serve to complement—and, in this case, reinforce—harder data.
8. The Red Sox had already lost their lead when the Buckner miscue occurred; even the *Mad Dog* acknowledges that the play is "overrated," hence weakening the case against McNamara for his role in the Red Sox's demise.

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The 1939 Yankees, the Greatest Road Team Ever

The 1939 Yankees are known as one of the greatest teams of all time. They were an outstanding squad, finishing 17 games ahead of the second-place Boston Red Sox and winning the AL pennant in a breeze. Sportswriters of the day referred to the 1939 American League as the Yankees and the seven dwarves. The World Series was not much more of a challenge, as the Yankees swept the Cincinnati Reds in four games. But were they the greatest road team ever?

The 1939 Yankees had a better record on the road than at home: at home 52-25, for a winning percentage of .675; on the road 54-20 (T-1), for a winning percentage of .730. Since 1900 only two major league teams have had better road winning percentages than the 1939 Yankees. They were the 1906 Cubs (60-15-1, .800), and the 1909 Cubs (57-20-1, .740). The selection, of the 1939 Yankees as the greatest road team ever is based on the incredible average of runs scored vs. runs allowed. In the 1939 season in road games, the Yankees outscored their opponents by 295 runs (585 runs scored while allowing only a little more than half that number, 295). This amounted to a scoring differential of 3.9 runs per game. In addition, the Yankees' 585 runs scored in 75 games set the major league road scoring record of 7.8 runs per game. By comparison, the 1906 Cubs had a scoring differential of 2.5 runs per game, while the 1909 Cubs were outscoring their opponents by a mere 2.0 runs per game.

How did the Yankees overpower their opponents that season on their opponents' home turf? The first part of the answer is that the 1939 Yankees had an outstanding lineup. The Yankees' lineup was all the more impressive as Ruth had retired four years earlier and Gehrig, beset by an illness that would be named after him, played only eight games that season. The second part of the answer is the Yankees hit much better on the road than at home. As a team the Yankees scored 585 runs in 75 road games based on offensive performances of: .304 BA, .394 OBP, and .470 SLG. The Yankees' respective home marks were .268/.352/.429. Only in home runs (84 to 82) did the Yankees

have a home performance that was better than on the road. The Yankees' road batting marks are all the more impressive when it is known that in this era (1931-39) the entire AL had on average better home batting performances. The 1931-39 AL average home/road batting ratios were: 1.049 BA, 1.053 OBP, and 1.057 SLG.[1] Adjusting the Yankees' road batting by the average AL home/road effect gives the following for the equivalent of an AL average home park: .319 BA, .415 OBP, and .497 SLG.

The Yankees' regular lineup that season included four left-handed batters (LHB), four right-handed batters (RHB), and a frequently used utility player Tommy Henrich (LHB). On the road that season, seven of these nine players put up astounding offensive numbers. Seven of the nine regulars hit above .300, and had OBP of .400 or better. The individual road batting marks for the nine regulars are shown below:

POS	Player	BA/OBP/SLG[2]
1b	Babe Dahlgren	.260/.327/.453
2b	Joe Gordon	.308/.400/.545
ss	Frankie Crosetti	.238/.339/.354
3b	Red Rolfe	.329/.413/.475
of	Charlie Keller	.372/.463/.555
of	Joe DiMaggio	.413/.486/.769
of	George Selkirk	.307/.468/.468
c	Bill Dickey	.331/.413/.471
of/1b	Tommy Henrich	.318/.412/.473

The road batting data for DiMaggio suggest that if Joe had played his home games in a merely average AL ballpark, he would have hit better than .400 that season—his actual BA for the season was a not-bad .381. DiMaggio's OBP (.486) and SLG (.769) in 1939 were amongst the top all-time AL batting performances on the road. As a group the LHB (including pitchers and reserves) hit .322 with an OBP of .422 and a SLG of .469. The RHB group had figures of .287/.367/.471. The RHB hit exactly twice as many home runs in road games as at home (58 versus 29), with Crosetti hitting seven of his 10 on the road and Dahlgren contributing 13 of 15.

In away games that season, the Yankees had overwhelming success against all opponents except the Boston Red Sox. The Yankees compiled the following W-L record and runs scored (R) and runs allowed (Opp. R) on their visits to AL cities:

RON SELTER is an economist who lives in El Segundo CA. A SABR member since 1989, he has done research and contributed articles on the minor leagues and major league ballparks.

Club	W	L	T	R	Opp R
Boston	3	5	1	65	62
Chicago	8	3	--	86	46
Cleveland	9	2	--	63	28
Detroit	7	4	--	101	53
Phila.	9	2	--	114	32
St. Louis	11	0	--	75	26
Washington	7	4	--	64	39

The visits to Philadelphia were especially enjoyable for the Yankee hitters. The games included numerous thrashings of the A's, highlighted with wins of 23-2 and 21-0. In the 11 games played in Philadelphia's Shibe Park, the Yankees hit .335 with an OBP of .411 and a SLG of .567. Against the woeful St. Louis Browns (the eighth-place Browns finished 64½ games out that season), the Yankees were unbeaten in the 11 games played at Sportsman's Park.

In the Yankees' 20 road losses that season, six were by one run and an additional four by two runs. Had the Yankees been able to save some of their "excess runs" (scored in blowout victories) and used them in their one- and two-run losses, their number of road victories would have been in the 60-65 range. The 1939 Yankees were a superlative offensive team on the road.

As for the pitching, the Yankee staff of starters Red Ruffing, Lefty Gomez, Bump Hadley, Atley Donald, Monte Pearson, and ace reliever Johnny Murphy was first in team ERA that season. In their games at their opponents' home fields they held opponents to a .249 BA, .333 OBP, and .358 SLG. In home games that season the AL as a whole had offensive marks of BA .281, OBP .355, and SLG .409. Thus the Yankee pitchers held their opponents to reductions in average Home offensive performance of BA -11%, OBP -6%, and SLG -13%. In addition, Yankee pitchers allowed the fewest runs of any AL team that season. The AL average in road games was 5.09 run per game, while Yankee pitching staff held opponents to 3.93 runs per game (a 23% lower level).

In summary, the 1939 Yankees were the greatest road team ever because the Bronx Bombers were such a great hitting aggregation outside their home turf in New York.

Notes

1. Home/road batting data for AL 1931-39 compiled by the author from official AL day-by-day team batting sheets.
2. Home/road batting data for Dickey, DiMaggio, Gordon, Henrich, and Keller from Pete Palmer; home/road batting data for all others compiled by the author from official AL day-by-day individual batting sheets.

300-Game Winners: A Vanishing Breed?

Now that Greg Maddux has won his 300th game, an obvious question arises. Will any other major league player reach that exalted level of pitching proficiency?

There is, of course, no conclusive answer. But the question is one of particular interest as baseball continues to undergo changes while it moves deeper into the 21st century.

To make a quick judgment, it appears highly unlikely that baseball will ever have another 300-game winner. The breed seems ready to disappear into the archives, joining other virtually extinct phases of the game such as the complete game, skillful bunters, and Sunday doubleheaders.

No part of baseball has been more subjected to substantial changes in the game than what takes place on the pitching mound. Sure, a strike is still a strike, and it takes three of them to record an out. It's not the process of delivering a baseball to home plate that has really changed. It's the combination of factors involving the business of pitching that is different. The whole system has changed considerably in recent decades, and those alterations have a strong bearing on the existence of future 300-game winners.

Equally significant, during the 2004 season after the masterful Maddux became just the 22d pitcher to win 300 games, there appeared to be no other potential 300-game winners in sight. In fact, at present there are only five active 200-game winners—Tom Glavine, Randy Johnson, David Wells, Mike Mussina, and Kevin Brown—in the majors. Each is a long way off from 300 wins (Glavine ended the season with 262 while Johnson had 246, Wells 212, Mussina 211, and Brown 207). And with Mussina the baby of the bunch at age 36, time is running out on all of them. On opening day 2005, Johnson and Wells will be 41, Brown 40, and Glavine 39.

Of the other top pitchers who are currently active, only four others have more than 175 wins, and all are up in years except Pedro Martinez. But neither Martinez (182 wins), Jamie Moyer (192), Curt Schilling (184), Kenny Rogers (176), nor any other high-level hurler will even have a chance to reach 300 unless he decides to continue pitching well into his 40s.

RICH WESTCOTT is the author of 15 baseball books, including *Winningest Pitchers—Baseball's 300-Game Winners* published by Temple University Press.

That's unlikely, said Don Sutton, the 19th pitcher to win 300 games. "Today's pitchers are not willing to make the sacrifice," Sutton claimed. "It's (winning 300) not important to them. They don't want to stick around until they're 40. They make millions of dollars, and they can retire at 35, so why keep pitching? Why spend from mid-February to October away from home much of the time if you already have millions in the bank?"

Long before the 38-year-old Maddux and, the season before him, Roger Clemens, 39, each won their 300th games, age was often a critical factor. Nolan Ryan, the last 300-game winner before Clemens, had to toil until he was 43 before entering the pitchers' Valhalla in 1990. And before that Warren Spahn and Tom Seaver were 40, Lefty Grove and Sutton were 41, Early Wynn and Gaylord Perry were 43, and Phil Niekro was 46.

But there's more to winning 300 games than longevity. Obviously, the feat demands extraordinary skill. It requires diligence, perseverance, innovation, and strength. A pitcher can have no long interruptions in his career. He needs to stay healthy, focused, and competitive. He needs a lot of breaks to go his way. It also helps to play with good teams, although that's not always been mandatory.

A pitcher has to be good like Cy Young and win 20 or more games 14 years in a row. Or like Kid Nichols and win 30 or more games in seven different seasons. Or Mickey Welch and complete the first 105 games he started. He has to be like Grover Cleveland Alexander and fire 16 shutouts in one year, or Lefty Grove and lead the league in earned run average nine times, or Sutton and never miss a start in 23 seasons, or Ryan and toss seven no-hitters and 12 one-hitters.

There's no room for mediocrity. Only the best pitchers with the strongest arms and the toughest minds are candidates for this select circle. And even some who fit that description—Hall of Famers such as Carl Hubbell, Bob Feller, Bob Gibson, Ted Lyons, Robin Roberts, Juan Marichal, Jim Palmer, and Sandy Koufax, to name a few—still didn't make it, although in some cases there were extenuating circumstances such as injuries, military service, early retirement, or playing for weak teams.

"You have to start young, win early, and get at least 600 starts," said Maddux, who had to win 15 or more games 17 consecutive years and pitch into his 19th big-league season to reach 300. Maddux admitted that he thinks 300-game winners

are a dying breed.

But even if a pitcher possesses all of the admirable qualities necessary to be a 300-game winner, that's no longer enough. The grand old game itself has imposed its own limitations, which collectively extinguish the chances future pitchers have of reaching the pinnacle of success in their craft.

The two-man starting staffs of Old Hoss Radbourn's day yielded to four-man rotations, which have now been replaced by five-man rotations. Instead of pitching every other day or even every fourth day, pitchers now work every fifth or sixth day. Automatically, that reduces a pitcher's number of starts—and decisions.

As a group, starting pitchers are also getting fewer wins because they complete fewer games and thus are not around to get the decision. While once Walter Johnson annually completed upward of 30 games a season—and a complete game was treated as a badge of honor—it is the rare pitcher today who breaks double figures in that category in a single season. As recently as 1972, Steve Carlton completed 30 games, but today entire pitching staffs don't even come close to reaching that total. (The league leaders in complete games in 2004 were the Oakland Athletics in the American League and the Montreal Expos in the National League with 10 and 11, respectively.)

Today's chuckers are also on pitch counts. And fewer pitches translate into fewer decisions. While the hurlers of yesteryear often exceeded 200 tosses in a game—Spahn once confided to me that he frequently reached that number and occasionally went well above it (although he never had a sore arm)—it is considered a good day's work now if a moundsman makes it to 100. In fact, if a pitcher nowadays manages to last six innings, he is celebrated for his "quality" effort.

The six-inning starter is the offspring of the heavily stocked modern bullpen with its closers, setup men, one-batter specialists, long relievers, and whoever else can find a spot on the bloated pitching brigades of today. As valuable as they have become, relief pitchers have generally reduced the numbers of wins (and losses) that starters used to accumulate.

There are still other changes that work against starting pitchers. To some extent, pitching has always been the sacrificial lamb of baseball. Although good hurlers usually find ways to overcome obstacles placed before them, often over the years when they became too effective, legislation was passed to knock them down a peg.

Their mounds were moved back (from 45 feet to 50 feet) and then in 1893 back again (to 60' 6"). The spitball and the use of other foreign substances were outlawed. And knockdown or brushback pitches were for all practical purposes removed from a hurler's arsenal. Indeed, rare is the pitcher who
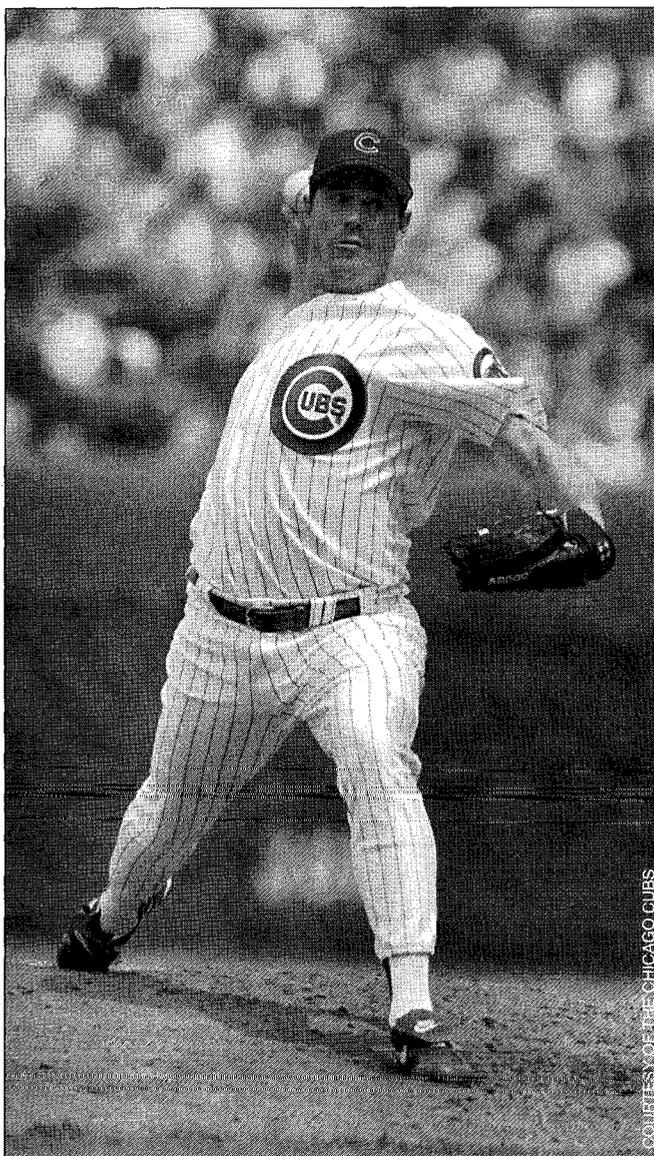
Greg Maddux

even throws inside anymore. And even if he does, many batters are cloaked in so much armor that it doesn't matter if one gets hit by a pitch every now and then.

At some point toward the later part of the 20th century, the powers that run baseball decided that fans come to ballparks to see hitters, not pitchers. A high-scoring game with lots of hitting, they theorized, has more appeal than a well-pitched, low-scoring game. Fans want to see home runs, it was concluded, and the more that are hit, the more they like it. Better to give fans a messy 11-9 slugfest than a well-played 2-1 pitchers' duel.

To ensure this assumption, a number of changes that gave hitters an advantage were instituted. First came the designated hitter in the American League. Pitching mounds were lowered. Strike zones were reduced. Livelier balls were put into play. And smaller ballparks with outfield fences almost close enough for a little leaguer to reach were built. Combining with these restraints on the fine art of pitching were inconsistent—and often atrocious—umpiring, catchers with so little experience that they didn't have a clue about calling games, nonchalant fielders, and bulked-up (steroid-enhanced?) hitters with bats (presumably not corked ones) that were so light that they could be swung only a little slower than the speed of sound.

The net effect was that hitting proliferated, resulting mostly in more home runs and ultimately higher scores. In 1950, for instance, 16 major league teams playing 154-game schedules averaged 92 home runs and 721 runs for the season. By 2004, with 30 teams each playing 162 games, the average was 181 homers and 775 runs per team.

The numbers of hitters reaching 500 career home runs or 3,000 career hits will become increasingly abundant, in the process it will render such feats increasingly less noteworthy. But the most significant career milestone for pitchers will take the opposite path.

This, of course, is not the first time that the 300-game winner has been consigned to extinction. In the 36 seasons between 1888 and 1924, 11 pitchers reached that exalted level. But after Alexander won his 300th in 1924, it appeared that the species had vanished. Seventeen years elapsed before the next pitcher (Grove) won his 300th. Then 20 more years passed before another 300-game winner (Spahn) arrived in 1961. Soon afterward, there was a 19-year gap between the 300th wins of Wynn in 1963 and Perry in 1982.

Perry led a parade of six 300-game winners over a nine-year period. But after Ryan became the 20th hurler to reach the magic mark in 1990, the feat wasn't accomplished again until Clemens did it in 2003. Meanwhile, such redoubtable hurlers as Tommy John (288), Bert Blyleven (287), Ferguson Jenkins (284), and Jim Kaat (283) fell just short.

Mel Stottlemyre, the astute pitching coach of the New York Yankees, and a 164-game winner during an 11-year career, allows for the slim possibility of there being another 300-game winner. But he leans more toward the likelihood that the breed has vanished forever.

"It will become harder and harder to win 300," he said. "Pitching has become tougher and more demanding, and it's harder to throw consistently for as long a period as it would take to win 300 games. It would take a tremendous amount of dedication to do it. You have to have a long career, and be successful every year, stay in condition all year, and stay away from injuries. I'm not sure there will be any more 300-game winners, but then again, you never know. Someone may pop up in the future with the dedication and pride that it takes to win that many games."

Although the deck seems clearly stacked against future 300-game winners, some others still have hope. One is Texas Rangers pitching coach Orel Hershiser, who won 204 games during a fine 17-year big-league career.

He said that there will be more than a few future 300-game winners, "for sure." How so?

"I think athletes in general always continue to progress," he said. "Just because pitching is getting really hard, it doesn't mean someone can't do it. I also don't think people retire because they have enough money. Actually, money might be an incentive for staying around longer.

"Another thing to consider," he added, "is that a lot of young pitchers are getting an earlier start. They're pitching in the major leagues when they're 20 or 21, whereas 20 or 30 years ago, they might still be in the minors for another four or five years. So they have more years to pitch and to win games."

They also have on their side highly advanced training facilities and procedures, plus the many gains made by medical science that treat injuries and prolong careers. But when put together, the many factors that conspire to decrease pitchers' effectiveness and their number of wins is likely to extract a price too heavy to overcome.

It's obvious, therefore, that unless there is the unlikely possibility that some unknown superman is lurking in the shadows, one of baseball's rarest and most treasured achievements will soon become extinct. And the number of baseball's 300-game winners will be frozen forever at 22.

Interesting Statistical Combinations

One of many things that makes baseball the most enjoyable sport is statistics. Players are considered great because of their statistical achievements. We are all familiar with the records for home runs in a season or career. Career strikeouts. Pitchers winning 20 games in a season. Batters hitting .300. All of these are interesting and enjoyable. Something like on-base percentage, however, is a little different since it combines other, seemingly unrelated, statistics. Just because a man has a high batting average does not mean he is going to walk a lot.

The purpose of this paper is to look at combinations of statistics rather than just individual statistics. We will not be doing any detailed analysis to speak of, just looking at the statistics because they are fun. Before we go any further, a big tip of the cap to Lee Sinins, creator of the *Sabermetric Baseball Encyclopedia*, without which this paper would not be possible. Some statistics are from baseball-reference.com.

HIGH BATTING AVERAGE, LOW WALKS

Since we mentioned on-base percentage above, we will start off with players with more than 600 at-bats in a season who hit .300 or higher but had less than 20 walks. The batting average would be considered good, but the lack of walks could make the player less valuable than someone batting .270 with a more discerning batting eye. Through the 2003 season, there have only been five players with such seasons. One did it twice.

Player	Year	Team	AB	H	BB	AVG	OBP
Hi Myers	1922	BKN	618	196	13	.317	.331
Woody Jensen	1935	PIT	627	203	15	.324	.344
Frank McCormick	1938	CIN	640	209	18	.327	.348
Don Mueller	1955	NYG	605	185	19	.306	.326
Garry Templeton	1977	STL	621	200	15	.322	.336
Garry Templeton	1979	STL	672	211	18	.314	.331

Interestingly, over half of these occurrences are before the 1970s and all of them are before the 1980s, when players have often become criticized for being free swingers lacking discipline. One thing that is no surprise; most of these seasons

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FRED WORTH is a professor of mathematics at Henderson State University in Arkadelphia. He is a lifelong Mets fan who plays softball and wears #24 in honor of his childhood hero, Willie Mays.

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came when the player was very young or in his first year as a regular player.

Player	Year	Age
Hi Myers	1922	33
Woody Jensen	1935	27*
Frank McCormick	1938	27*
Don Mueller	1955	28
Garry Templeton	1977	21*
Garry Templeton	1979	23

* first year as regular player

Another recent example of a similar combination was Jose Molina in 2003. Molina managed to have 114 official at-bats and walk only once. His batting average was just .184, but he certainly fits the spirit of the above list. More than 100 at-bats with only one walk has happened 162 times in baseball history, mostly by pitchers. Among those pitchers were Togie Pittinger, Pud Galvin, and Bobo Newsom, the only ones to achieve this dubious distinction three times. Chuck Fulmer, John Peters, and Bill Holbert deserve special mention; of the 12 players achieving this notoriety twice, they were the only ones who were not pitchers. Peters had 379 official at-bats (the most of anyone with only one walk) for the 1879 Cubs. Other notable non-pitchers were Nap Lajoie (his rookie year of 1896), Jake Beckley (his last season, 1907), and Dan Brouthers (his rookie year of 1879). Those with more knowledge of the history of rules might enlighten us as to whether there were rule peculiarities, particularly in 1879, that made walks less common. Notable pitchers who accomplished this were Dizzy Dean (twice), Jim Bunning (twice), Cy Young (twice), Mickey Welch (twice), Addie Joss, Walter Johnson, Ferguson Jenkins, Bob Gibson, Waite Hoyt, Grover Cleveland Alexander, Jack Chesbro, Steve Carlton, Amos Rusie, Red Ruffing, Early Wynn, Ed Walsh, Warren Spahn, Ted Lyons, Joe McGinnity, Phil Niekro, and Dutch Leonard.

LOTS OF EACH KIND OF EXTRA-BASE HIT

In all of baseball history, only five players have had at least 20 doubles, 20 triples, and 20 home runs in the same season. No player did it more than once. These are George Brett, Jim Bottomley, Wildfire Schulte, Jeff Heath, and the greatest all-around baseball player of all time, Willie Mays.

Player	Year	Team	Age	2B	3B	HR
Wildfire Schulte	1911	CHI(N)	28	30	21	21
Jim Bottomley	1928	STL(N)	28	42	20	31
Jeff Heath	1941	CLE	26	32	20	24
Willie Mays	1957	NYG	26	26	20	35
George Brett	1979	KC	26	42	20	23

Not surprisingly, all five were relatively young at the time. Also not surprisingly, Willie Mays had the most home runs of the five.

This achievement is somewhat notable because one might presume that a player who hit over 20 home runs would often have outfielders playing fairly deeply, minimizing the chances of hitting a triple.

Two other players, Ryne Sandberg and Buck Freeman, came close to joining this esteemed group, with Freeman having what is probably the oddest set of numbers of this group of players.

Player	Year	Team	Age	2B	3B	HR
Ryne Sandberg	1984	CHI(N)	24	36	19	19
Buck Freeman	1899	WAS	27	19	25	25

A few other players have done things similar to what Freeman did. Here are the players with less than 20 doubles and home runs, but at least 20 triples.

Player	Year	Team	Age	2B	3B	HR
Buck Ewing	1884	NYG	24	15	20	3
Dick Johnston	1887	Braves	24	13	20	5
Joe Visner	1890	Burghers	30	15	22	3
Jocko Fields	1890	Burghers	25	18	20	9
Bid McPhee	1890	Reds	30	16	22	3
Jake Virtue	1892	Spiders	27	15	20	2
Duff Cooley	1895	Cardinals	22	9	20	7
Geo. Van Haltren	1896	Giants	30	18	21	5
Harry Davis	1897	Pirates	23	10	28	2
Tommy Leach	1902	PIT	24	14	22	6
Sam Crawford	1902	CIN	22	18	22	3
Chief Wilson	1912	PIT	28	19	36	11
Vic Saier	1913	CHI(N)	22	15	21	14
Jake Daubert	1922	CIN	38	15	22	12
Dale Mitchell	1949	CLE	27	16	23	3

Special note should be taken that Visner and Fields were teammates. Also, note that Cooley did not have even 10 doubles or home runs. Davis had 40 extra-base hits and 70% of them were triples. Not surprisingly, none of these are recent, with Mitchell the only one occurring in the past 80 years.

LOTS OF RBI AND FEW RUNS

Sometimes players, typically leadoff hitters, may score a lot of runs but not knock in many. An example of this would be 21-year-old Lloyd Waner, scoring 133 runs while knocking in only 27 for the 1927 Pirates. Usually, if a player knocks in a lot of runs, then he is likely to score a lot of runs as well. Three players in baseball history have finished a season with more than 100 RBI and fewer than 60 runs scored.

Player	Year	Team	Age	R	RBI
Gus Bell	1959	CIN	30	59	115
Vic Wertz	1960	BOS	35	45	103
Danny Tartabull	1996	CHI(A)	33	58	101

These would certainly be cases of players doing a lot but not getting a lot of help from teammates. Though I do not know it, I would suspect these batters probably batted sixth for teams with weak bottoms of the order.

LOTS OF RBI AND NO HOME RUNS

Most of the time the people with a lot of runs batted in also have a large number of home runs. Several players have managed to have a lot of RBI yet not many home runs. The kings of this category are Hughie Jennings and Lave Cross.

Player	Year	Team	Age	HR	RBI
Hughie Jennings	1896	BAL	27	0	121
Lave Cross	1902	PHI(A)	36	0	108

Five other players managed to knock in over 100 runs while hitting only one home run.

Player	Year	Team	Age	HR	RBI
Farmer Vaughn	1893	Reds	29	1	108
Jack Doyle	1896	Orioles	26	1	101
Cupid Childs	1896	Spiders	28	1	106
Kid Gleason	1897	Giants	30	1	106
Bill Sweeney	1912	BOS	26	1	100

Vaughn deserves special mention since he was the only one of these seven to bat under .300. He hit only .280 on 135 hits yet still managed over 100 RBI. At the other end of that spectrum was Jennings, who batted .401 in 1896. Another interesting note is that Jennings and Doyle were teammates.

LOTS OF HOME RUNS AND FEW RBI

Turning our previous category around, let us now consider players who hit a lot of home runs but had comparatively few runs batted in. The following are the only players to have hit 40 or more home runs while knocking in fewer than 100 runs.

Player	Year	Team	Age	G	HR	RBI	Seasons with 40+ HR	30+ HR	20+ HR
Duke Snider	1957	BKN	30	139	40	92	5	6	10
Mickey Mantle	1958	NYY	26	150	42	97	4	9	14
Mickey Mantle	1960	NYY	28	153	40	94	4	9	14
H. Killebrew	1963	MIN	27	142	45	96	8	10	13
Hank Aaron	1969	ATL	35	147	44	97	8	15	20
R. Petrocelli	1969	BOS	26	154	40	97	1	1	3
Hank Aaron	1973	ATL	39	120	40	96	8	15	20
Davey Johnson	1973	ATL	30	157	43	99	1	1	1
Darrell Evans	1985	DET	38	151	40	94	2	4	10
Matt Williams	1994	SFG	28	112	43	96	1	6	10
Ken Griffey Jr.	1994	SEA	24	111	40	90	7	7	11
Barry Bonds	2003	SFG	38	130	45	90	7	13	16

A couple of comments should be made about this list.

It should immediately be noted that, if not for the strike that ended the season early in 1994, Griffey and Williams would probably not be on the list. No team played more than 117 games that season.

Notice also that 1973 was the only year that Davey Johnson hit even 20 home runs. Petrocelli never topped 30 again and bested 20 only two other times.

Also, notice that Johnson and Aaron were teammates. This may give some indication of why these players are on the list. If a team has a lot of players hitting home runs, there are less likely to be men on base for others who hit home runs. In 1973, Johnson and Aaron were joined by Darrell Evans in hitting 40 or more home runs. Evans, though on this list for 1985, knocked in 104 runs in 1973. Notice that, in most cases, these players were teammates of other sluggers, minimizing RBI chances.

Player	Year	Team	Teammates with 40+ HR	30+ HR	20+ HR	10+ HR	90+ RBI
Duke Snider	1957	BKN	0	0	1	5	1
Mickey Mantle	1958	NYY	0	0	1	7	1
Mickey Mantle	1960	NYY	0	1	2	5	2
H. Killebrew	1963	MIN	0	2	3	7	1
Hank Aaron	1969	ATL	0	0	1	5	0
R. Petrocelli	1969	BOS	1	1	3	5	1
Hank Aaron	1973	ATL	2	2	3	5	3
Davey Johnson	1973	ATL	2	2	3	5	3
Darrell Evans	1985	DET	0	0	3	7	2
Matt Williams	1994	SFG	0	1	1	1	0
Ken Griffey Jr.	1994	SEA	0	0	2	4	0
Barry Bonds	2003	SFG	0	0	2	7	0

LOTS OF HOME RUNS BUT FEW DOUBLES

It is not unusual that players who hit a lot of home runs will also have a lot of doubles. Todd Helton and Albert Belle are good examples of this. Five players turned the unusual trick of having 50 or more home runs but less than 20 doubles.

Player	Year	Team	Age	2B	HR
Jim Thome	2002	CLE	31	19	52

	Year	Team	Age	2B	HR
Willie Mays	1955	NYG	24	18	51
Roger Maris	1961	NYY	26	16	61
Mickey Mantle	1961	NYY	29	16	54
Ralph Kiner	1949	PIT	26	19	54

Notable is the presence of a pair of teammates. Mantle and Maris shared more than their home run race in 1961.

It would be expected that these players would possibly be a little older, but Thome is the only one who was even 30 when he accomplished the feat. Most surprising of all would have to be Willie Mays. In 1955, Mays had 24 stolen bases (just one behind the league leader) and 13 triples (tied for the league lead). He was very fast but for some reason had only 18 doubles.

Mantle is the only other player among these who was ever noted for his speed, but by 1961 he was beginning to have problems with his knees.

Let us turn now to a few pitching statistics.

LOTS OF LOSSES BUT LOW ERA

Typically, a pitcher with an ERA below 2.00 is not going to lose a lot of ball games. Surprisingly, 15 times there have been pitchers with ERAs below 2.00 who lost 20 or more games.

Pitcher	Year	Team	Age	W	L	ERA
Jim Devlin	1876	Grays	27	30	35	1.56
Will White	1878	Red Stockings	23	30	21	1.79
Sam Weaver	1878	Cream Citys	22	12	31	1.95
Will White	1879	Red Stockings	24	43	31	1.99
Monte Ward	1880	Grays	20	39	24	1.74
Jim McCormick	1880	Blues	23	45	28	1.85
Tony Mullane	1882	Colonels	23	30	24	1.88
Guy Hecker	1884	Colonels	28	52	20	1.80
Pud Galvin	1884	Bisons	27	46	22	1.99
Silver King	1888	Cardinals	20	45	21	1.64
Harry Howell	1905	STL(A)	28	15	22	1.98
Kaiser Wilhelm	1908	BKN	34	16	22	1.87
Ed Walsh	1910	CHI(N)	29	18	20	1.27
Jim Scott	1913	CHI(N)	25	20	20	1.90
Walter Johnson	1916	WAS	28	25	20	1.90

Noteworthy is Will White's repetition on the list. Notice also the presence of some fairly outstanding pitchers, particularly Pud Galvin, Ed Walsh, and Walter Johnson.

Certainly there is no surprise that these are all from a long time ago. Back in those days pitchers would start 50 or 60 games a season, not once every five or six days. This explains why a number of these pitchers won a substantial percentage of their games despite the 20+ losses. It is also back in the days when fielders' gloves were poor or nonexistent. A pitcher might allow 10 or 12 runs with only one or two earned. Still, remarkable in all this is the 1.27 ERA that Ed Walsh had in 1910 and that he still finished below .500. Of course, it did not help that the White Sox had a team batting average of .211 that year.

LOTS OF WINS AND HIGH ERA

The obvious counterpart to the previous list is pitchers with 20 or more wins but ERAs over 5.00. A pitcher would have to be good to keep losing games yet keep being handed the ball. But when a pitcher's ERA is over 5.00, he is not likely to stay in the rotation very long if the manager has any other choice. Neither is he likely to win a whole lot of games. Not surprisingly, there are not many on this list.

Pitcher	Year	Team	Age	W	L	ERA
Ray Kremer	1930	Pirates	37	20	12	5.02
Bobo Newsom	1938	Browns	30	20	16	5.07

Something unsurprising is that both pitchers were veterans, making their managers more likely to put up with the high ERA. Also, both earned some consideration since they did somehow manage to win more of their games than they lost. Kremer, remarkably, had a winning percentage of .625.

Also, keep in mind that 1930 was one of the years of incredible offensive production. That was the year of Hack Wilson's 56 HRs and many other huge numbers. The Pirates had a team batting average of .303, helping to explain Kremer's success.

In 1938, while the Browns did have a team batting average of .281, they finished with a record of 55-97. Apparently there weren't a whole lot of options other than Newsom.

LOTS OF WINS AND SAVES

We will conclude with our only career statistic consideration. This one is basically in honor of Dennis Eckersley on the occasion of his election to the National Baseball Hall of Fame. "Eck" is the only pitcher in history to have more than 150 wins and saves. However, if John Smoltz continues pitching out of the bullpen with the success he has had recently, he will join Eckersley in either 2004 or 2005. Fifteen players have had at least 100 of each.

Pitcher	SV	W	G	GS	MOST GS	MOST W	MOST SV
D. Eckersley	390	197	1071	361	35	20	51
Rollie Fingers	341	114	944	37	19	13	37
Goose Gossage	310	124	1002	37	29	13	33
Hoyt Wilhelm	227	143	1070	52	27	15	27
Roy Face	193	104	848	27	13	18	28
Lindy McDaniel	172	141	987	74	26	15	29
Stu Miller	154	105	704	93	20	14	27
Dave Giusti	145	100	668	133	34	15	30
Bob Stanley	132	115	637	85	30	16	33
John Smoltz	110	163	529	361	36	24	55
Tom Gordon	110	113	591	203	34	17	46
Ron Kline	108	114	736	203	39	14	29
Ron Reed	103	146	751	236	34	18	17
Ellis Kinder	102	102	484	122	30	23	27
F. Marberry	101	147	551	187	32	19	22

Sparky Lyle finished his career with 238 saves and 99 wins, just missing being included on our list.

Each pitcher won 13 or more games at least once. All except for Fingers, Miller, Kline, and Gossage won 15 at least once. All except for Reed had at least 20 saves at least once. Marberry is the only other who didn't record at least 27 at least once.

John Smoltz is the only one on the list with more than half of his appearances as a starter. Considering his age, it is possible that will stay that way. Another point about Smoltz is that, thus far, there are only three seasons in which he has recorded a save, and one of those he had only 10.

One thing that this chart illustrates is the differing role of "closers" over the years. Commenting on Eckersley's Hall of Fame election, Rollie Fingers talked about the changes during his career. Closers used to pitch two or three innings in a game. Now they typically pitch one inning. Starters used to finish large percentages of their games; now their job is to get through six or seven innings effectively. That would explain the comparatively high number of wins compared to saves for Wilhelm, McDaniel, Fingers, and Marberry.

CONCLUSION

Obviously there are many more comparisons that could be considered. These are just a few of the ones.

World Series "What Might've Beens"
When Player Injuries Have Most Affected the Outcome

Speculating on ultimately unanswerable questions remains one of most fascinating aspects for those of us who study baseball history. For example, how might many of the all-time records differ if Josh Gibson, Satchel Paige, Oscar Charleston, and all of the other great Negro League stars had been eligible to play in white Organized Ball? How about if Willie Mays had been able to break Babe Ruth's' home run record if hadn't played the latter two-thirds of his career in windy Candlestick Park? Especially in the World Series does speculation run freely. What if Earl McNeely's ground ball had not struck a pebble in the bottom of the 12th inning of the 1924 World Series, thus ensuring Walter Johnson's only win of the classic and the only world championship for the Washington Senators? Or what if, in 1962, Willie McCovey had hit Ralph Terry's last pitch two feet higher? (Thank you, Charlie Brown!)

But when a player who'd made crucial contributions to his team all year is not eligible for the World Series, ah, that's when the speculative wheels really begin to spin! The prevailing wisdom among many current analysts and baseball professionals is that "anything can happen in a short series" (just ask the 1969 Baltimore Orioles)! No doubt about it—despite the importance of depth on any team, if a star pitcher or everyday player is missing when two fairly evenly matched teams are trying to win four of seven games, the outcome can be huge. There have been several occasions where that's happened, and in this brief study we'll try to determine when injured players have made the biggest difference in the outcome of a World Series.

First, a few ground rules of what we will not be considering in this study for the purpose of comparison:

1. **NO MILITARY SERVICE:** We'll deal only with actual physical injuries that caused a player to miss the entire World Series. During WWII so many players wore the uniform of their country, it becomes impossible to make meaningful comparisons. Would the Cardinals have beaten the Yankees in 1943 if they'd had Enos Slaughter, Terry Moore, and Johnny Beazley?

ED MENTA is a professor of theater arts at Kalamazoo College, where he lives with his wife and two children.

(Of course, the Yankees were missing Joe DiMaggio, Tommy Heinrich, and Phil Rizzuto). No doubt that the Cardinal string of three consecutive pennants (1942-44) was helped by the fact that Stan Musial did not begin his service commitment until 1945, while their strong "brothers battery" of Mort and Walker Cooper was never drafted. (In 1944, the St. Louis Browns won their only pennant helped because the draft had created what we would now call "parity" in the American League.)

2. **NO LATE-SEASON INELIGIBLES:** Perhaps the strongest example here is Pedro Ramos of the 1964 Yankees, who was traded to the Yankees shortly after the September 1 deadline, and over the last month of the season made 13 relief appearances, picking up one victory and eight saves with a 1.25 ERA while compiling 21 strikeouts and zero walks in 22 innings. Nevertheless, in our research there have been relatively few examples of such late-season ineligible players, so the Ramos example remains a unique occurrence. (For example, in 1970 Mudcat Grant was traded from the Oakland Athletics to the Pittsburgh Pirates too late to help the Bucs in their NLCS bout with the Cincinnati Reds. Despite his 2.25 ERA in 12 appearances, Grant had no saves and it is doubtful he would have been able to help his team prevent the three-game sweep by Sparky Anderson's "Big Red Machine.")

3. **NO PARTIAL INJURIES:** There have been several cases where, despite their injuries, players have participated in a few games of the World Series. In the same 1964 series against the Cards, because of circulatory problems in his left arm, Whitey Ford was unable to appear after pitching and losing Game One. In other Yankee World Series, due to various injuries, Mickey Mantle had been able to start only two games in 1955 and five in 1957 (perhaps not coincidentally, the Dodgers and Braves beat the Yankees in each of those seven-game series). Also with the Yankees, in 1921 Babe Ruth missed the final three games with an infected arm and knee injury (Ruth did pinch-hit in the final and eighth game and grounded out, making the final out of the series).

So what criteria should we use in determining which players' injuries were the most crucial for their teams in series play?

1. **PLAYERS MUST HAVE CONTRIBUTED TO THEIR TEAMS FOR A FULL SEASON:** Yes, Tommy Davis would have undoubtedly helped the 1965 Los Angeles Dodgers to their series victory over the Minnesota Twins, but Davis played in only 17 games at the beginning of the year and the Dodgers did manage to win the pennant (and series) without him. Also outside this category is Lou Gehrig of the 1939 Yankees. As all serious baseball fans know, Gehrig's consecutive-game streak of 2,130 was halted that year when he succumbed to the debilitating illness that would claim his life two years later. He played only eight games, leaving the lineup on May 2, 1939. Yet the Yankees steamrolled to a pennant and swept the Cincinnati Reds in October.

2. **THE TEAMS IN QUESTION LOST THE WORLD SERIES WITHOUT THESE KEY PLAYERS:** This eliminates such examples as Reggie Jackson, who pulled a hamstring muscle in the 1972 ALCS against the Detroit Tigers. His Oakland Athletics won the series anyway in seven games over the Reds (albeit with a very close 3-2 victory in Game Seven). Others like Jackson who were key players for their teams over the course of a season, then missed the series (or most of it) but their teams won anyway are:

   A. Dodgers outfielder and 1988 National League MVP Kirk Gibson, whose multiple injuries limited him to one memorable walk-off home run at-bat in Game One of the 1988 series against Oakland. The Dodgers went on to defeat Oakland in five games without any further appearances by Gibson.

   B. Willie Randolph, who was replaced by the immortal Brian Doyle at second base in the 1978 Yankees six-game series win over the Dodgers.

   C. Pitcher Steve Barber, whose sore arm was hardly missed by the 1966 Baltimore Orioles rotation, when the Birds limited the Dodgers to two runs in a four-game sweep.

   D. Ernie Lombardi, who because of a severely sprained ankle appeared in but two games of the series for the 1940 Reds (one was as a pinch-hitter), saw his team defeat the Tigers in another close Game Seven, 2-1.

Which brings us to our last criterion:

3. **THE SERIES HAD TO GO SEVEN GAMES IN ORDER TO BE CONSIDERED:** The reasoning here is simple. If the two teams were fairly evenly matched, then logically the teams would battle to the wire, going to a final single game. In such Game Sevens, undoubtedly a key player who'd been missing could have made a crucial difference. This eliminates such instances as:

   A. Boston Braves outfielder Jeff Heath, whose broken ankle caused him to miss the 1948 fall classic against the Cleveland Indians (the Tribe won in six).

   B. Don Mueller, of the 1951 New York Giants, who pulled a tendon sliding into third in the ninth inning of Game Three of the infamous playoff against Brooklyn, and watched his teammates succumb to the Yankees in the series, also four games to two.

   C. Little-remembered Cincinnati Reds pitcher Wayne Simpson, whose shoulder injury ruined a strong season (he was 14-3 with a 3.02 ERA) and prevented him from starting in the 1970 series, which his team lost in five games to the Baltimore Orioles. (In that same year Reds 20-game winner Jim Merritt also suffered a late-season elbow injury, but was given a desperation start by manager Sparky Anderson in the final game. Unfortunately, Merritt lasted only 1⅔ innings and yielded three runs.)

But none of the above examples contain a series that went to seven games without a single key player available to the losing team. Now, of course, one may argue with opposite logic that maybe a really key player's absence would perhaps contribute to his team losing in less than seven games. Perhaps the most famous example here is the 1905 series, when the Giants defeated the Philadelphia Athletics in four games to one. Rube Waddell, Connie Mack's star left hander, was unable to appear in any of the five games. John McGraw's Christy Mathewson shut out the Giants three times (Iron Man Joe McGinnity and Chief Bender also pitched shutouts for the other Giant victory and the lone A's win respectively, so each of the five games was a shutout!) Still, it is hard to accept that one pitcher could have made the difference from one victory to four. And Waddell's arm certainly wouldn't have helped the A's puny .161 series batting or their inability to score against Mathewson in 27 innings.

So we come back to our original question: Which seven-game World Series have been most impacted by the losing

team having an injury to a key player out for the entire series, moreover, a player who'd made a great contribution over a full season? Surprisingly, all of answers to the above question are within the last 30 years of series play, three are in one decade, and two are for the same team! Here they are chronologically:

1. 1975 - Jim Rice, Red Sox vs. Reds
2. 1982 - Rollie Fingers, Brewers vs. Cardinals
3. 1985 - Vince Coleman, Cardinals vs. Royals
4. 1987 - Jack Clark, Cardinals vs. Twins

1. 1975 - JIM RICE, RED SOX VS. REDS

Jim Rice had an astounding rookie season in 1975, helping the Red Sox to the American League pennant by appearing in 144 games, with a .309 batting average, 22 homers, 109 RBI, and an OPS (combined slugging and batting averages) of .841. Rice, however, was overshadowed by his teammate Fred Lynn, who that season became the only player to win both the Rookie of the Year and Most Valuable Player Awards. Nevertheless, the Red Sox series hopes suffered a severe blow when Rice broke his wrist on September 21 and was out for rest of the season and post-season. Rice had been alternating between left field and the designated hitter that year, with Carl Yastrzemski playing mostly first base. For the series against the Reds, which at the time did not allow the use of the DH, manager Darrell Johnson shifted Yaz to left field for four of the seven games, (he also played three games at first base) and used a combination of Cecil Cooper at first, and Juan Beniquez, Rick Miller, and Bernie Carbo in left, in effect to replace the missing Rice. Cooper, Beniquez, and Miller combined to go 2 for 29 for a batting average of .069 with an OPS of .267. While Carbo did slam a crucial pinch-hit three-run homer in the renowned Game Six, he had only seven other plate appearances (four of them in Game Seven, when Johnson finally decided to let him start a game). It's hard to believe that Rice couldn't have helped turn the tide in this famously close series. It's at least likely that he would have done better than .069, especially with the right-handed-hitting Rice facing such Cincy left handers as Don Gullett, who started three games, Fred Norman, who started one, and Will McEnaney, who relieved in five of the seven games (Rice hit .340 against lefties that season with an OPS of .930). Furthermore, at Fenway, where four of the seven games were played, Rice hit .313 with an OPS of .877. When Rice finally got his chance in the 1986 series against the Mets, he hit .333, although none of his nine hits were home runs (he did manage one double and one triple).

2. 1982 - ROLLIE FINGERS, BREWERS VS. CARDINALS

It seemed to be as commonly held opinion as there possibly can be in baseball that the Milwaukee Brewers of the late 1970s and early 1980s lacked only a reliable bullpen to put them over the top. The "Brew Crew" had tremendous hitting and strong defense with players such as Robin Yount, Sal Bando, Paul Molitor, Gorman Thomas, Jim Gantner, and Ben Oglivie. The starting pitching, led by Mike Caldwell and Moose Haas, while certainly not spectacular, was adequate. The 1978, '79, and '80 Brewers won 92, 95, and 86 games respectively and had yet to appear in the post-season. Then in 1981, in a blockbuster trade with the St. Louis Cardinals, the Brewers received Rollie Fingers, Ted Simmons, and Pete Vuckovich in exchange for David Green, Sixto Lezcano, and Lary Sorensen. In the 1981 strike-shortened season, Fingers saved 28 games and posted a 1.04 ERA. He not only won the Cy Young award, he became the first American League pitcher to cop the MVP simultaneously (a feat since duplicated by Willie Hernandez in 1984 and Dennis Eckersley in 1992). Although the Brewers were eliminated by the Yankees in a close five-game Divisional Series, Fingers had a win and a save in the two Milwaukee victories. In 1982, Fingers saved another 29 games, but he tore an arm muscle in September and the Brewers had to stave off the Baltimore Orioles' furious stretch drive without him. Right hander rookie Pete Ladd had some success in substituting for Fingers in the Brew pen, especially in the ALCS against the California Angels. Milwaukee won the five-game series with three consecutive wins after losing the first two when Ladd and Jim Slaton combined for three saves. But in the World Series against the Cardinals, Ladd himself was also injured and appeared in only one game, pitching two-thirds of an inning. Manager Harvey Kuenn relied heavily on lefty Bob McClure, who relieved five times in the seven-game series. McClure recorded the only two saves for the team in the series, but he compiled a 4.15 ERA, and he also lost two contests, including Game Seven. In the sixth inning of the series finale, McClure relieved starter Vuckovich with one out and runners at second and third, attempting to protect a 3-1 Brewer advantage. He walked right-handed batter Gene Tenace (pinch-hitting for left-handed batting third baseman Ken Oberkfell), then allowed run-scoring singles to lefty-swinging Keith Hernandez and righty George Hendrick, allowing the Redbirds to go ahead 4-3, a lead they would never relinquish. Many fans and writers second-guessed Kuenn's decision to leave southpaw McClure in the game to face Hendrick with the series on the line, and right-hander Haas ready in the bullpen. But Haas was ineffective in the October classic, posting a 7.36 ERA (in fact, Haas yielded two important insurance runs to the Cards in the eighth inning). Harvey Kuenn would have not had

to choose the lesser of two evils in this critical situation if Rollie Fingers had been available. Since the bullpen allowed 15 hits and nine walks in ten innings for an ERA of 7.20, noting that the Milwaukee Brewers missed Rollie Fingers in the 1982 World Series is a bit like saying that drummer Pete Best got a little unlucky when he was fired by the Beatles.

3. 1985 - VINCE COLEMAN, CARDINALS VS. ROYALS
Former manager Whitey Herzog knows something about how injuries affect championship games. In his book, *You're Missin' A Great Game*, Herzog states:

> All my life, I've been good enough to get my teams close .... But the strangest things would happen once I got there. You'd have made money betting on Herzog teams over the long haul. But if you'd put your money on some horrible break happening at the last minute, you could have retired early. . . . In 1985, not only did The Call stomp all over us [Herzog is referring to umpire Don Denkinger calling the Royals' Jorge Orta safe at first when he was clearly out leading off the bottom of the ninth inning in Game Six, which led to a two-run game winning rally when the Cards were three outs from the world championship], but the fastest ballplayer in history—our offensive catalyst that year, the base thief Vince Coleman—got run over by a two-mile-an-hour mechanical tarp before the Series began. Two years later we played the Twins in the Series. Two guys, Jack Clark, and Terry Pendleton, accounted for most of our offensive production that year, but both went down with late season injuries. We lost.

Let's deal with Whitey's bad luck in 1985 first. Vince Coleman had an incredible rookie season, stealing 110 bases while being thrown out a mere 25 times, a success rate of 81%. Further, the Cardinal teams of the '80s will forever be remembered for playing "Whiteyball," a high-octane running attack that in 1985 featured, besides Coleman, such speedsters as Ozzie Smith, Tommy Herr, Andy Van Slyke, and Willie McGee, each of whom stole more than 30 bases. As a team, the Cards stole 314 bases, the fourth best total in baseball history (in contrast, they hit a league low 87 home runs). Yet in the Series, the Redbirds managed two stolen bases. Even more astounding, they attempted only five steals in the entire series! Royals' catcher Jim Sundberg caught all seven games. True, over his career he was an excellent defensive catcher with a powerful and accurate arm. But during the regular season, Sundberg nailed 25 of 85 runners, for a 29% average. Yet, in the Coleman-less series, he nailed three of the paltry five Cardinal base thieves, for an

average of 60%! Coleman did get another chance, two years later, against the Twins in the 1987 classic. Despite a poor series at bat, hitting only .143 with a .200 OBA, he stole six bases and was not caught once. Although utility outfielder Tito Landrum played left field in his absence in the '85 series against the Royals (which did not allow the designated hitter) and batted a team-high .360, it seems a safe bet that without Vince Coleman, the St. Louis Cardinals never were able to even begin to play their style of winning baseball in the 1985 World Series.

4. 1987 - JACK CLARK, CARDINALS VS. TWINS
As we have seen, two years later Vince Coleman played in another World Series. This time it was the absence of a slugger, Jack Clark, and not a base-stealing threat that may have prevented Herzog's Redbirds from becoming champions. Clark was the only legitimate power threat in the Cards' speedster lineup. In 1987 he smacked 35 of the team total of 94 homers and drove in 106 runs in only 419 official at-bats. In addition, Clark led the National League with a .597 slugging average, a .459 OBA, and 136 walks. But on September 7, Clark severely sprained his ankle and was done for the season. Although he made one pinch-hitting appearance in St. Louis's seven-game NLCS victory over the San Francisco Giants, he missed the entire World Series against the Twins, which the Cards lost in seven games. This time the designated hitter was allowed in the four home games played in the Metrodome, and Herzog replaced first baseman Clark with a tandem of Curt Ford, Dan Driessen, and Jim Lindeman at both DH and first. None of them played particularly poorly (Lindeman hit .308), but it is quite likely the Redbirds missed Clark's powerful bat in the middle of the lineup. As a team, they hit only two home runs in the entire series. Clark would have faced left hander Frank Viola in his three starts, and southpaw Dan Schatzeder also appeared three times in the series. Oddly, in 1987 Clark reversed his career-long practice of hitting lefties better than righties, but he still posted a .543 slugging average that year against left handers. It's also possible that the third-place Cardinals hitter missed cleanup man Clark hitting behind him (Herr batted .250 in the series with one RBI). In the 1985 season, with Clark following him in the batting order, Herr hit .302 and drove in 110 runs! In 1987, Herr came down to earth a bit, hitting .263, but he still had 83 RBI. Perhaps, as Herzog said, it was the combination of injuries to both Clark and third baseman Terry Pendleton that doomed the Cardinals in the 1987 World Series. But unlike Clark, Pendleton did manage to appear in the fall classic, playing three of the seven games.

CONCLUSION

Of course, ultimately no one can predict with 100% certainty "what might have been" in any situation, much less the unpredictability of baseball in a short series. Still, these four examples stand out because these injured players made major contributions to their teams all season long, and when they missed the entire World Series, each of their teams lost in the seventh game. Isn't it reasonable to think they had they been able to contribute, they might have swung the pendulum from defeat to victory in just one game? Now imagine the consequences of these four "what might've beens." The Milwaukee Brewers would have won their only world championship, the St. Louis Cardinals may have cracked the lineup of Neyer and Epstein's "Greatest Baseball Dynasties" with three series victories in six years in the 1980s, and the Boston Red Sox would have first broken the "Curse of the Bambino" over 25 years ago!

Notes

1. According to Dave Halberstam's book *October 1964*, if the Phillies had won the National League pennant, there had been talk of both them and the Yankees adding a pitcher to their rosters. When the Cardinals won the pennant, such talk was quashed. Ramos might very well have made the difference in the series. Although Yankee relievers posted a 3.89 ERA, Al Downing and Pete Mikkelsen gave up several big Cardinal hits in key situations, and it seemed that manager Yogi Berra had lost confidence in his other relief hurlers, such as Rollie Sheldon, Steve Hamilton, Hal Reniff, and Stan Williams.
2. Ford's arm was so painful that he was unable to cut his food.
3. In fact, in their excellent account of the greatest teams of all time, *Baseball Dynasties*, authors Rob Neyer and Eddie Epstein cite the fact that Gehrig missed all season as one of the reasons the 1939 Yankees are the greatest team of all time, reasoning that even an average season by Gehrig (instead of the poor offensive performance by his replacement at first base by Babe Dahlgren) would have lifted the team to an even greater level of achievement.
4. In fairness to Doyle, he led all series batters with a .438 average!
5. The 1940 world champion Reds overcame all odds at the catching position. In addition to Lombardi's injury, reserve catcher Willard Hershberger, supposedly despondent over his pitch calling in a Reds' loss, committed suicide on August 2. In the series, coach Jimmy Wilson was activated to catch and hit .353. After the series Wilson quit to become manager of the Cubs. The Reds voted a full World Series share to Hershberger's mother.
6. For years rumors persisted that gamblers had "gotten to" Rube Waddell and that Mack did not trust him in the series. Alan H. Levy conclusively lays this theory to rest in his biography, *Rube Waddell: The Zany, Brilliant Life of a Strikeout Artist*. Using contemporary newspaper accounts and interviews, Levy demonstrates that Mack's decision not to use Waddell stems from an injury that he suffered in his left shoulder in early September. While waiting on a Providence train platform, Rube attempted to destroy teammate Andy Coakley's straw hat (a custom of the time was that such "straw boaters" should not be worn after Labor Day) and a scuffle followed. Mack used his ace left-hander in relief on September 27 and even had him warming up before Game Four of the Series, but Rube was ineffective on both

occasions. Fans (and baseball history) were denied the opportunity to see what would have been one of the premiere pitching matchups in World Series annals—Rube Waddell vs. Christy Mathewson—but it was because of an injury, not gambling.
7. In 1975, Lynn won the batting title with a .331 average, with 21 home runs, 105 RBI, and league-leading numbers of 103 runs scored, 47 doubles, a slugging average of .566, with a .401 OBA.
8. Fingers had never actually played for the Cardinals. A few days before the Milwaukee trade, Whitey Herzog had acquired him from the San Diego Padres. Fingers became expendable when Herzog also traded for Bruce Sutter from the Chicago Cubs.
9. Indeed, the Brewers played their final four games of the season in Baltimore, losing the first three, which tied the teams for first place. Milwaukee won the finale 10-2, securing the pennant by a scant one-game margin and spoiling the party for Earl Weaver as the sentimental favorite (the O's manager had previously announced this would be his last season; it wasn't – Earl "unretired" in 1985)!
10. In this pre-Mariano Rivera era, at the time, 1982, Fingers held the all-time record for World Series saves with six. He also had an ERA of 1.35 in his three World Series with Oakland.
11. In the same page of this quote from his book, Herzog also claims that it was Amos Otis's injury that forced him to re-shuffle his lineup for the 1976 ALCS against the Yankees, therefore allowing Chris Chambliss's pennant-winning home run to go over the glove of right fielder Hal McRae by six inches (the 5'8" McRae was replacing the 6'4" Al Cowens, who'd been shifted to center field)!
12. Clark also struck out 139 times. Herzog notes in *You're Missin' a Great Game* that, before his injury, Clark had a chance to come to bat 300 times without touching the ball. "No hitter in baseball—not even the Babe (did that)!"
13. Clark played only 14 games in his career in the Metrodome and hit one home run, but he did bat .289 and slug .400. In 1987, Clark batted .261 and slugged .543 against lefties. Lifetime, he compiled an even .300 batting average and slugged .533 against portsiders.
14. In fact, with the exception of 1985, each of these Game Sevens was close, going into the late innings before the winning team secured the lead. In '85, of course, the Royals blew out the Cardinals 11-0.

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No-Hitter Probabilities: What Are the Odds?

A no-hitter turns a pitcher into an instant celebrity in the baseball world. Regardless of what he did before or what he does after, he'll always be a member of an elite group, a fraternal brotherhood that links Cy Young and Nolan Ryan with the likes of Jose Jimenez, Mike Warren, and Bobo Holloman.

What are the odds of a pitcher throwing a no-hitter? How can we measure a pitcher's potential for making the leap to celebrity? Who are the top pitchers who have never thrown a no-hitter? Of the pitchers who have thrown no-hitters, who was the least likely? These questions can be answered with some basic probability calculations along with the help of a desktop computer and a thorough statistics database.

When considering the probability of a pitcher throwing a no-hitter we are, in mathematical terms, trying to calculate the probability of a pitcher achieving 27 consecutive outs before allowing a hit. Walks, errors, hit batsmen, and other intervening events don't concern us as long as there are 27 outs recorded before a single hit is allowed.

Accordingly, there are only two statistics that we need for each pitcher we wish to analyze: outs achieved (innings pitched multiplied by three) and hits allowed. The ratio of outs achieved (OA) to the sum of outs achieved and hits allowed (H) yields the probability of a pitcher getting an out instead of giving up a hit for all the batters he faced that did one or the other, or P(O). Mathematically, we would say: $P(O) = OA/(OA+H)$.

Statistically speaking, the probability of a sequence of independent events is equal to the product of their individual probabilities. So, the probability of achieving 27 outs without a hit is $P(O) \times P(O) \times P(O) \ldots \times P(O)$ (27 times). Mathematically, $P(NH) = P(O) \char`^ 27$.

I applied this formula to the career statistics for every pitcher in major league history with at least one career start through the 2004 season to find the most likely pitcher to throw a no-hitter. I expected to see a lot of familiar names at the top of the list, but instead I found some statistical anomalies. There are 11 pitchers with at least one major league start who either never

BOB KAPLA has been a SABR member since 1995. He, his wife, and their five children have lived all around the country and now reside in Green Bay, WI. Bob would like to thank Pete Hepokoski for his helpful suggestions for simplifying the math.

allowed a single hit, never got anyone out, or both. If a pitcher never allowed a hit, then the formula above predicts that they have a 100% chance of throwing a no-hitter every time they start a game. If they never achieved an out, then the formula will predict that they have 0% chance of ever throwing one. If, as three of them did, they didn't give up any hits or achieved any outs, then the formula fails when you try to divide by zero. Fortunately, the pitching careers of these eleven players are not statistically significant—they each had exactly one career start—and we can discount them while we examine the rest of the pitchers. The 11 pitchers are:

Table 1. One start and 0 innings pitched and/or 0 hits allowed

Name	IP	H
Dave Pierson (1876 Reds)	0	?
Jay Parker (1899 Pirates)	0	0
Frank DuPee (1901 White Sox)	0	0
Charlie Fritz (1907 A's)	2⅔	0
Pat McGehee (1912 Tigers)	0	1
Jim Scoggins (1913 White Sox)	0	0
Dan "Babe" Sherman (1914 Whales)	⅓	0
Clay Roe (1923 Senators)	1⅔	0
Joe Brown (1927 White Sox)	0	2
Marty Walker (1928 Phillies)	0	2
Cesar Tovar (1968 Twins)	1	0

After discounting the 11 pitchers above, the one that moves to the top of the list is Randy Hennis of the 1990 Houston Astros. In three career games (one start) he allowed one hit in 9⅔ innings. With 29 outs achieved and only one hit allowed his $P(O)=0.9667$ and his $P(NH)=0.4004$, or about 1 in 2.50. Since Hennis's career of 9⅔ IP is not a good statistical sample, I changed the criteria to only consider pitchers with at least 100 career starts. Table 2 details the 25 pitchers most likely (among the 1,202 pitchers through 2004) with at least 100 career starts.

You may be puzzled by the asterisk by Pedro Martinez's name. For determining whether or not a pitcher has thrown a major league no-hitter I slightly altered the criteria from those recognized by Major League Baseball. I considered any pitcher who completed nine innings without allowing a hit including those that went on to give up hits in extra innings, such as Harvey Haddix, or were relieved sometime after nine innings.

Table 2. 25 pitchers most likely w/at least 100 starts (through 2004 season) (* has thrown a no-hitter)

Name	IP	G	GS	CG	H	O+H	P(O)	P(NH)	"1 in"
Herb Score	858.1	150	127	47	609	3184	0.808731	0.003241	309
Nolan Ryan*	5386.0	807	773	222	3923	20081	0.804641	0.002827	354
Sandy Koufax*	2324.1	397	314	137	1754	8727	0.799015	0.002339	428
Pedro Martinez*	2296.0	388	321	42	1746	8634	0.797776	0.002243	446
Sid Fernandez	1866.2	307	300	25	1421	7021	0.797607	0.002230	448
J.R. Richard	1606.0	238	221	76	1227	6045	0.797022	0.002186	457
Andy Messersmith	2230.1	344	295	98	1719	8410	0.795600	0.002083	480
Kerry Wood	1043.0	164	164	11	804	3933	0.795576	0.002082	480
Randy Johnson*	3368.0	489	479	92	2612	12716	0.794589	0.002013	497
Sam McDowell	2492.1	425	346	103	1948	9425	0.793316	0.001928	519
Ed Walsh*	2964.1	430	315	250	2346	11239	0.791263	0.001797	556
Joe Wood*	1436.1	225	158	121	1138	5447	0.791078	0.001786	560
Babe Ruth	1221.1	163	148	107	974	4638	0.789996	0.001721	581
Bob Turley	1712.2	310	237	78	1366	6504	0.789975	0.001720	581
Orval Overall	1535.1	218	182	133	1232	5838	0.788969	0.001662	602
Jeff Tesreau*	1679.0	247	206	123	1350	6387	0.788633	0.001643	609
Ed Reulbach	2632.1	399	300	201	2117	10014	0.788596	0.001641	609
Dave Boswell	1065.1	205	151	37	858	4054	0.788357	0.001628	614
Mario Soto	1730.1	297	224	72	1395	6586	0.788187	0.001618	618
Jimmy Dygert	986.0	175	104	62	798	3756	0.787540	0.001583	632
Addie Joss*	2327.0	286	260	234	1888	8869	0.787124	0.001560	641
Jack Pfiester	1067.1	149	128	75	869	4071	0.786539	0.001529	654
Cy Morgan	1445.1	210	172	107	1180	5516	0.786077	0.001505	664
Jose DeLeon	1897.1	415	264	21	1556	7248	0.785320	0.001466	682
Jim Maloney*	1849.0	302	262	74	1518	7065	0.785138	0.001457	686

Table 3. 25 pitchers most likely w/at least 100 starts who have never thrown a no-hitter

| Name	IP	G	GS	CG	H	O+H	P(O)	P(NH)	"1 in"
Herb Score	858.1	150	127	47	609	3184	0.808731	0.003241	309
Sid Fernandez	1866.2	307	300	25	1421	7021	0.797607	0.002230	448
J.R. Richard	1606.0	238	221	76	1227	6045	0.797022	0.002186	457
Andy Messersmith	2230.1	344	295	98	1719	8410	0.795600	0.002083	480
Kerry Wood	1043.0	164	164	11	804	3933	0.795576	0.002082	480
Sam McDowell	2492.1	425	346	103	1948	9425	0.793316	0.001928	519
Babe Ruth	1221.1	163	148	107	974	4638	0.789996	0.001721	581
Bob Turley	1712.2	310	237	78	1366	6504	0.789975	0.001720	581
Orval Overall	1535.1	218	182	133	1232	5838	0.788969	0.001662	602
Ed Reulbach	2632.1	399	300	201	2117	10014	0.788596	0.001641	609
Dave Boswell	1065.1	205	151	37	858	4054	0.788357	0.001628	614
Mario Soto	1730.1	297	224	72	1395	6586	0.788187	0.001618	618
Jimmy Dygert	986.0	175	104	62	798	3756	0.787540	0.001583	632
Jack Pfiester	1067.1	149	128	75	869	4071	0.786539	0.001529	654
Cy Morgan	1445.1	210	172	107	1180	5516	0.786077	0.001505	664
Jose DeLeon	1897.1	415	264	21	1556	7248	0.785320	0.001466	682
Pete Richert	1165.2	429	122	22	959	4456	0.784785	0.001440	695
Rube Waddell	2961.1	407	340	261	2460	11344	0.783145	0.001361	735
Jake Weimer	1472.2	191	180	143	1227	5645	0.782640	0.001337	748
Tommy Byrne	1362.0	281	170	65	1138	5224	0.782159	0.001315	760
Fred Beebe	1294.1	202	153	93	1090	4973	0.780816	0.001256	796
Doc Scanlan	1252.0	181	149	102	1061	4817	0.779738	0.001210	827
Barry Zito	981.0	153	153	9	832	3775	0.779603	0.001204	831
Gary Gentry	902.2	157	138	25	770	3478	0.778608	0.001163	860
Chuck Estrada	764.1	146	105	24	652	2945	0.778608	0.001163	860

Pedro Martinez threw nine perfect innings against San Diego on June 3, 1995, while pitching for the Montreal Expos, but gave up a leadoff double to Bip Roberts in the 10th inning. I also included Ernie Shore, who achieved 27 outs (though the first one was already on base) without allowing a hit in relief of Babe Ruth on June 23, 1917.

Herb Score's impressive career statistics put him at the top of the list ahead of such notable no-hit artists as Nolan Ryan and Sandy Koufax, though he never actually threw a no-hitter. Table 3 details the 25 most likely pitchers with at least 100 career starts who have never thrown a no-hitter.
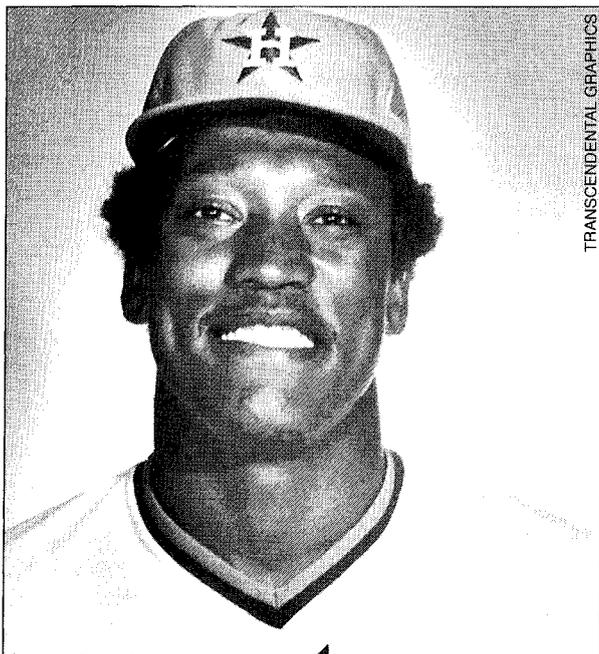
J. R. Richard came within a Reggie Smith infield single
of no-hitting the Dodgers on 4/19/80.
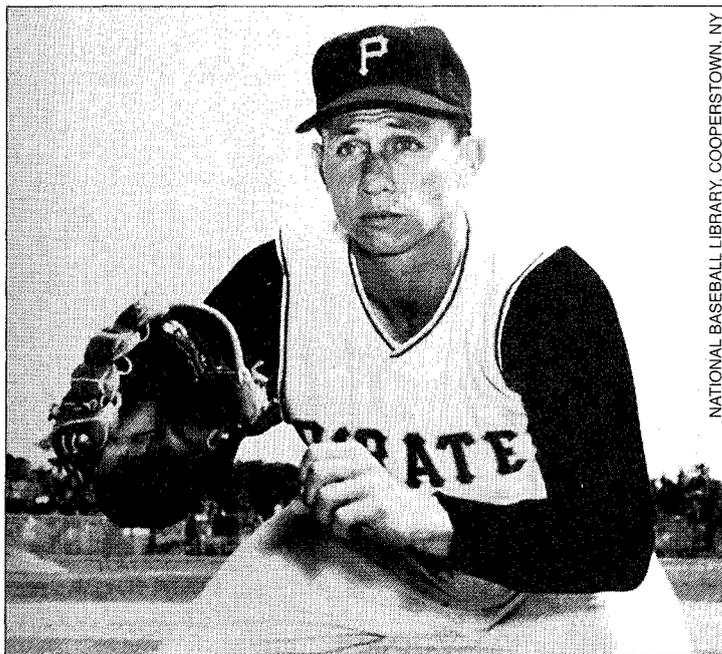
Harvey Haddix tossed twelve perfect innings against Milwaukee on 5/26/59,
losing the no-hitter and the game in the 13th.

Sandy Koufax's four career no-hitters are second only to Nolan Ryan's seven.

The P(NH) in the above tables is the calculated probability that a pitcher would throw a no-hitter in any single start based on his career stats. There is another way to analyze the data using each pitcher's P(NH) and his number of career starts. With these two numbers it is possible to calculate the probability that a pitcher would throw *at least* one no-hitter in his career number of starts.

The math is similar to that we used to find P(NH). The probability of a pitcher throwing at least one no-hitter in "x" starts is equal to 1 minus the probability that he would go "x" starts without any no-hitters at all. The probability of a pitcher *not* throwing a no-hitter in a single start is: $1 - P(NH)$, or $P'(NH)$. So, the probability of a pitcher not throwing any no-hitters in "x" consecutive games is $P'(NH) \times P'(NH) \times \ldots \times P'(NH)$ ("x" times). If we use a pitcher's number of career starts for "x" we get a product equal to the probability that the pitcher would throw *exactly zero* no-hitters in his career. Subtracting that probability from 1 yields the probability that the pitcher would throw *at least one* no-hitter in his career. In math terms, if GS is a pitcher's number of career starts and $P'(NH) = 1-P(NH)$ is the calculated probability that he would *not* throw a no-hitter in a start, then the probability that he would throw *at least* one no-hitter is his career is: $P(\text{at least one career NH}) = 1 - (P'(NH)^{GS})$.

Table 4. Pitchers most likely to have at least one career no-hitter (* has thrown a no-hitter)

Name	GS	P(NH)	Probability
Nolan Ryan*	773	0.002827	88.79%
Randy Johnson*	479	0.002013	61.91%
Walter Johnson*	666	0.001361	59.63%
Tom Seaver*	647	0.001365	58.67%
Sandy Koufax*	314	0.002339	52.06%
Roger Clemens	639	0.001139	51.73%
Pedro Martinez*	321	0.002243	51.36%
Don Sutton	756	0.000910	49.75%
Sid Fernandez	300	0.002230	48.82%
Sam McDowell	346	0.001928	48.71%
Jim Palmer*	521	0.001202	46.57%
Andy Messersmith	295	0.002083	45.95%
Steve Carlton	709	0.000865	45.87%
Bob Gibson*	482	0.001238	44.95%
Tim Keefe	594	0.000967	43.72%
Ed Walsh*	315	0.001797	43.26%
Bob Feller*	484	0.001149	42.69%
Catfish Hunter*	476	0.001127	41.53%
Christy Mathewson*	551	0.000948	40.71%
Eddie Plank	529	0.000961	39.86%
Gaylord Perry*	690	0.000716	38.99%
Ed Reulbach	300	0.001641	38.90%
J.R. Richard	221	0.002186	38.35%
Warren Spahn*	665	0.000725	38.26%
Phil Niekro*	716	0.000666	37.96%

Not surprisingly, Nolan Ryan is at the top of this list because of his relatively high probability of throwing a no-hitter in a single start and a large number of starts. Based on this analysis it would have been incredibly unlikely that he could go through his career without throwing a no-hitter at all. In fact, Ryan and five of the other six pitchers with a greater than 50% expectation of a career no-hitter (Randy Johnson, Walter Johnson, Tom Seaver, Pedro Martinez, and Sandy Koufax) have all actually thrown no-hitters. Of the top 25 listed above, 15 (60%) have thrown major league no-hitters. Though he has the highest probability among pitchers with at least 100 career starts of throwing a no-hitter in an individual start, Herb Score doesn't appear in the list because of his comparatively few career starts (127).

Through the 2004 season, Roger Clemens tops the list of those with the greatest career probability of a no-hitter who have never done it:

Table 5. Pitchers most likely to throw at least one career no-hitter who haven't done it

Name	GS	P(NH)	Probability
Roger Clemens	639	0.001139	51.73%
Don Sutton	756	0.000910	49.75%
Sid Fernandez	300	0.002230	48.82%
Sam McDowell	346	0.001928	48.71%
Andy Messersmith	295	0.002083	45.95%
Steve Carlton	709	0.000865	45.87%
Tim Keefe	594	0.000967	43.72%
Eddie Plank	529	0.000961	39.86%
Ed Reulbach	300	0.001641	38.90%
J.R. Richard	221	0.002186	38.35%
Charlie Hough	440	0.001080	37.83%
Rube Waddell	340	0.001361	37.06%
Luis Tiant	484	0.000950	36.87%
Whitey Ford	438	0.001015	35.91%
Greg Maddux	604	0.000735	35.86%
Fergie Jenkins	594	0.000729	35.15%
Herb Score	127	0.003241	33.79%
Bob Turley	237	0.001720	33.50%
John Smoltz	361	0.001093	32.61%
Don Drysdale	465	0.000847	32.56%
Early Wynn	612	0.000636	32.24%
Jose DeLeon	264	0.001466	32.12%
Pete Alexander	599	0.000646	32.08%
Mordecai Brown	332	0.001158	31.94%
Mario Soto	224	0.001610	30.42%

Of the pitchers on this list, only Roger Clemens, Greg Maddux, and John Smoltz are active and still have an opportunity to throw a major league no-hitter.

Among the pitchers who have thrown major league no-hitters, who overcame the greatest odds to do so? Table 6 lists the 25 most unlikely pitchers since 1900 to have thrown no-hitters based on the probability of throwing at least one no-hitter in their career number of starts:

Table 6. Least likely pitchers who have thrown a major league no-hitter

Name	GS	Prob.	Year (Tm – Lg)
Bobo Holloman	10	0.29%	1953 (STL - AL)
Bud Smith	24	0.52%	2001 (STL - NL)
George Davis	22	0.81%	1914 (BOS - NL)
Jose Jimenez	38	0.84%	1999 (STL - NL)
Mike Warren	27	1.05%	1983 (OAK - AL)
Bill McCahan	40	1.45%	1947 (PHI - AL)
Charlie Robertson	142	2.30%	1922 (CHI - AL)
George Culver	57	2.31%	1968 (CIN - NL)
Ed Lafitte	75	2.51%	1914 (BKN - FL)
Paul Dean	87	2.64%	1934 (STL - NL)
Ernie Koob	55	2.70%	1917 (STL - AL)
Juan Nieves	81	2.70%	1987 (MIL - AL)
Bob Keegan	87	2.85%	1957 (CHI - AL)
Mal Eason	113	2.86%	1906 (BKN - NL)
Clyde Shoun	85	2.91%	1944 (CIN - NL)
Bobby Burke	88	3.47%	1931 (WAS - AL)
Ed Head	53	3.47%	1946 (BKN - NL)
Cliff Chambers	113	3.84%	1951 (PIT - NL)
Nixey Callahan	177	4.01%	1902 (CHI - AL)
Big Jeff Pfeffer	69	4.05%	1907 (BOS - NL)
Don Black	113	4.45%	1947 (CLE - AL)
Don Nottebart	89	4.46%	1963 (HOU - NL)
Dick Fowler	170	5.05%	1945 (PHI - AL)
Derek Lowe	120	5.17%	2002 (BOS - AL)
Alex Main	44	5.17%	1915 (KC - FL)

Bobo Holloman overcame incredibly long odds to throw his no-hitter considering he started only 10 games in his one-year career with the St. Louis Browns. Derek Lowe and Jose Jimenez are still active and could increase their career odds by accumulating more career starts before they are done, though Jimenez is now a reliever and has started only seven of the 296 games he has pitched in since his no-hitter season of 1999.

Who should you watch today if you want to see a no-hitter? Among the 182 pitchers active in 2004 with at least 50 career starts, the 25 listed below have the highest probability of throwing a no-hitter in an individual start. So, if you want to maximize your odds of seeing a no-hitter, buy a ticket to see Pedro Martinez pitch against Kerry Wood. Some of these pitchers have taken their skills from the rotation to the bullpen (Mike Remlinger, Arthur Rhodes, John Smoltz, and Tom Gordon), but still have the minimum 50 career starts to appear on the list. If they get pressed into starting duty it may be worth seeing—history could be made.

Who is at the other end of the spectrum among pitchers active in 2004? These are the pitchers to watch if you're an offensive-minded fan and really want to see some hits instead of a pitching duel.

Table 7. 25 active pitchers most likely to throw a no-hitter in a single start (min. 50 career starts)

Name	IP	G	GS	CG	H	O+H	P(O)	P(NH)	"1 in"
Pedro Martinez	2296.0	388	321	42	1746	8634	0.797776	0.002243	446
Kerry Wood	1043.0	164	164	11	804	3933	0.795576	0.002082	480
Randy Johnson	3368.0	489	479	92	2612	12716	0.794589	0.002013	497
A.J. Burnett	644.2	102	99	10	535	2469	0.783313	0.001369	731
Johan Santana	624.1	151	75	1	519	2392	0.783027	0.001355	738
Oliver Perez	412.2	70	69	2	345	1583	0.782059	0.001311	763
Barry Zito	981.0	153	153	9	832	3775	0.779603	0.001204	831
Roger Clemens	4493.0	640	639	117	3846	17325	0.778009	0.001139	878
Brandon Webb	388.2	64	63	2	334	1500	0.777333	0.001113	899
John Smoltz	2699.2	602	361	47	2327	10426	0.776808	0.001093	915
Carlos Zambrano	539.2	101	80	4	467	2086	0.776127	0.001067	937
Mike Remlinger	817.0	560	59	4	711	3162	0.775142	0.001031	970
Hideo Nomo	1871.1	301	299	16	1631	7245	0.774879	0.001022	979
Josh Beckett	430.1	77	74	1	376	1667	0.774445	0.001006	994
Mark Prior	446.2	70	70	4	393	1733	0.773226	0.000964	1037
Arthur Rhodes	922.0	551	61	5	816	3582	0.772194	0.000930	1075
Curt Schilling	2812.2	482	370	82	2492	10930	0.772004	0.000924	1082
Tony Armas Jr.	565.0	102	102	0	502	2197	0.771507	0.000908	1101
Al Leiter	2248.2	386	356	16	1998	8744	0.771500	0.000908	1101
Chan Ho Park	1454.2	269	224	9	1294	5658	0.771297	0.000902	1109
Kazuhisa Ishii	473.0	86	86	2	421	1840	0.771196	0.000898	1113
Orlando Hernandez	876.1	139	136	8	780	3409	0.771194	0.000898	1113
Victor Zambrano	495.2	138	64	1	442	1929	0.770866	0.000888	1126
Tom Gordon	1896.2	671	203	18	1703	7393	0.769647	0.000851	1175
Wade Miller	768.0	127	123	5	699	3003	0.767233	0.000782	1279

Table 8. 25 active pitchers least likely to throw a no-hitter in a single start (min. 50 career starts)

Name	IP	G	GS	CG	H	O+H	P(O)	P(NH)	"1 in"
Nate Cornejo	313.0	56	56	3	404	1343	0.699181	0.000064	15707
Josh Towers	348.1	64	52	2	422	1467	0.712338	0.000105	9495
Chad Durbin	331.1	75	56	3	396	1390	0.715108	0.000117	8550
Kevin Jarvis	749.1	174	114	4	894	3142	0.715468	0.000119	8435
Brian Meadows	816.1	218	122	3	972	3421	0.715873	0.000120	8307
Ryan Drese	427.2	80	71	3	502	1785	0.718768	0.000134	7449
Mark Hendrickson	378.1	78	64	3	443	1578	0.719265	0.000137	7311
Jimmy Anderson	574.2	122	96	3	672	2396	0.719533	0.000138	7238
Glendon Rusch	1163.1	225	183	10	1342	4832	0.722268	0.000153	6533
Jason Jennings	607.0	104	104	2	696	2517	0.723480	0.000160	6244
La Troy Hawkins	901.0	443	98	2	1028	3731	0.724471	0.000166	6018
John Halama	816.2	205	114	2	931	3381	0.724638	0.000167	5980
Paul Quantrill	1186.2	791	64	1	1349	4909	0.725199	0.000171	5857
Mike Maroth	539.0	87	87	3	611	2228	0.725763	0.000174	5735
Esteban Loaiza	1663.0	300	263	12	1883	6872	0.725990	0.000176	5687
Jimmy Haynes	1200.2	227	203	2	1358	4960	0.726210	0.000177	5641
Darren Oliver	1407.0	306	228	11	1591	5812	0.726256	0.000178	5631
Elmer Dessens	914.0	249	128	2	1031	3773	0.726743	0.000181	5530
Tomokazu Ohka	665.2	124	115	4	750	2747	0.726975	0.000182	5482
Brian Anderson	1516.1	285	239	12	1704	6253	0.727491	0.000186	5378
Matt Kinney	377.2	98	57	1	424	1557	0.727681	0.000187	5341
Tanyon Sturtze	706.0	187	83	4	792	2910	0.727835	0.000188	5310
Ramiro Mendoza	796.0	341	62	2	889	3277	0.728715	0.000195	5140
Jose Lima	1381.2	312	199	8	1539	5684	0.729240	0.000198	5041
Todd Ritchie	835.2	184	120	7	929	3436	0.729627	0.000201	4969

None of the pitchers on the list above have thrown a major league no-hitter. The most unlikely among pitchers active in 2004 to have actually accomplished the no-hit feat are Terry Mullholland (1 in 4,061) and Scott Erickson (1 in 4,440).

An extra look at Nolan Ryan: Whenever the topic is no-hitters, Nolan Ryan warrants special attention. Since it's clear he should have thrown at least one no-hitter—nearly an 89% probability—I was wondering how unlikely it was that even Nolan Ryan would do it seven times. Calculating the probability that a pitcher would throw a specific number of no-hitters is only slightly more complex than the math we've already done. Given the probability of throwing a no-hitter – P(NH) – and the probability of *not* throwing a no-hitter – P'(NH) – and the number of starts to be considered we can use what's known as binomial probability to calculate the probability of throwing "n" no-hitters in "x" starts.

According to binomial probability, the probability of "n" successes (no-hitters) in "x" trials (starts) is equal to: $[P(\text{success})^n * P(\text{failure})^{(x-n)} * C(x,n)]$, where C(x,n) is the number of combinations of "x" items taken "n" at a time. The C(x,n) factor is included to account for the number of different ways to arrange the "n" no-hitters among the "x" starts and is calculated as: $(x!)/[(n!)(x-n!)]$, where $x! = 1*2*3* \ldots x$. When all the pieces are put together it looks far more daunting than it actually is:

$P(\text{"n" no-hitters in "x" starts}) = [P(NH)^n * P'(NH)^{(x-n)} * (x!)/[(n!)(x-n!)]$

In Nolan Ryan's case, P(NH) = 0.0028266, P'(NH) = 0.9971734, and x=773 career starts. The table below shows the probabilities of Ryan throwing 0-7 no-hitters in his career.

Table 9: Probability of Nolan Ryan throwing seven no-hitters

No-hitters	Probability in 773 starts
0	11.213%
1	24.570%
2	26.884%
3	19.585%
4	10.687%
5	4.659%
6	1.690%
7	0.525%

You can see that Ryan was far more likely to throw one or two no-hitters in his career than to not throw any at all. In fact, he was almost as likely to throw four (10.687%) as he was to throw none (11.213%)! But even for him, seven no-hitters was quite a feat.

As long as the odds are against them, no-hitters will continue to fascinate fans and immortalize the pitchers that throw them.

Corrections

The following errors in previous journals have been noted by readers and/or the contributors themselves. We have not noted the occasional misspelled word or grammatical error, unless it is a misspelling of a name. If you come across errors in other annual journals, please contact the editor in writing.

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In Maxwell Kates' "Of Horsehides and Hexagrams" there are two statements that need clarification:

1. Jim Palmer's adoptive father, Morris Wiesen, was in fact Jewish. This is listed in "Palmer vs. Palmer," one of the articles included in Boswell's *Why Time Begins on Opening Day*.
2. There were actually three Jewish players of Sephardic background. Besides Sam Nahem and Al Silvera, both descended from Syrian Jews, contemporary Pirates reliever John Grabow is descended of Lebanese Jews on his maternal grandmother's side. (Source: Jonathan Mayo's "Pittsburgh's Newest Jewish Star Athlete").

In Jay Thomas' article on Ivy League players in the majors, the following corrections were received:

Bob Keegan is not a graduate of the University of Pennsylvania. It is likely Ed Keegan, who did not respond to an inquiry by SABR on the subject.

Bob Richardson adds the name of 1884 Washington (UA) catcher Bill Rollinson. Rollinson was actually William Henry Winslow, Brown University class of 1880.

Jeff Orleans, Executive Director of the Council of Ivy Group Presidents, and who (along with Steve Eschenbach) is the source of the Ivy League list used, noted several incorrect spellings . These include Toots Shultz, not Schultz; Roy Thomas (1899-1911), not Bill Thomas (1902); Woody Wagenhorst, not Wagenhurst; Steve Yerkes, not Stan.

Additions (all to Yale) include: Edgar (A. E.) Smith—the A. E. is important to distinguish him from E. E. Smith, who graduated the same year as A. E. and also played MLB; Bill Vinton, Denny O'Neil.

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The following corrections were noted by Ken Johnson in the article on "Ball Exit Speed Ratio (BESR)":

1. There are five instances on page 12 where the case fraction ½ is missing in the equations. There is a blank space where the fraction should be.

2. In Figure 3 a minus sign is incorrectly placed before the number 0.728. This number represents the BESR and cannot be a negative.

To Herm Krabbenhoft's essay on consecutive-game on-base streaks, Trent McCotter adds the name of Bill Joyce, who had 64 games in 1891. Trent and Herm have concluded that Joyce, of the Boston AA team, reached safely via hit, walk, or HBP in each of his first 64 games that season, from April 8 to July 2 inclusive. This is the fifth-longest CGOBS found yet, finishing a game short of tying Ted Williams's 65-game stretch in 1948. Amazingly, Joyce played played only 65 games in 1891. During the July 2 game, he was injured and played only once more—as a sub in the last game of the season, in which he did not reach base safely. This is the third streak of 50+ CGOB found for Joyce (he also had a 56-game streak in 1896 and a 54-game streak in 1894).

In Herb Crehan's article on Red Sox spring training, Bobby Doerr misremembers the star of the film *The Greatest Show on Earth*. It was Betty Hutton, not Barbara Hutton.

The article incorrectly states that the Red Sox finished ninth in 1925; they finished eighth, though 49½ games out would argue lower.

David Holtz corrects the date of the first Sunday major league game in Boston. It was April 14, 1929, not April 14, 1925, which was a Tuesday. The City Series began in 1925.

Herb notes that the Red Sox played their Sunday home games at Braves Field for the next 3½ seasons because of the number of churches near Fenway Park. The first Sunday game at Fenway Park was played July 3, 1932. Of greater general interest is the fact that the Boston City Council had to approve the exemption from the Sunday "Blue Laws" on an annual basis. City Councilor Irving Muchnick used this as leverage to force the Sox to provide a tryout for Jackie Robinson, Sam Jethroe, and Marvin Williams in April 1945.

The caption of the Red Sox manager should read Pinky (not Pinkie) Higgins.

W.C. Madden's article on scoring in the CWS states that J. D. Drew and Edmund Muth each hit three home runs in a College World Series game. The next sentence states that Drew set the total bases record, when in fact he tied Muth.

In Warren Wilbert's article on 1-0 games starting on page 89, all the percentages are understated by a factor of 100; e.g., the percent for the totals in Table 1 should be 2.29%, not .0229%.

On page 91 it gives Lee Richmond's first name as John. It should be J.

Cliff Blau points out on page 93 that Lew Burdette pitched 13 (not 12) shutout innings in the Harvey Haddix game. Also on the same page, in 1969, the American League Championship Series was best-of-five, not best-of-three.