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Designer
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Our thanks to these peer reviewers
and designated readers:

New List of Names?

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## 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 l'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, Lowell Blaisdell, Jerry Nechal, and Ron Selter have written articles that will 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

Of the 230 MLB games HERM KRABBENHOFT has attended, 14 have featured a leadoff homer, including the one hit by Lou Brock of the Cardinals at Tiger Stadium in the 1968 World Series.

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 singleseason 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 | 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 | 2 |


| 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 sin-gle-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 centuries1895 (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 homerun crowns, including Hall of Famers Billy Hamilton, Earle Combs, and Lou Brock.

The chronology of the players who first achieved each sin-gle-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 singleseason 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 <br> Milestone | Player | Team | Lg | Year |
| :--- | :--- | :--- | :--- | :--- |
| 1 | Jack Remsen | HAR | NL | 1876 |
| 2 | Charley Jones | BOS | NL | 1878 |
| 3 | George Wood | DET | NL | 1882 |
| 4 | Buck Ewing | NY | NL | 1883 |
| 5,6 | Jimmy Ryan | CHI | NL | 1889 |
| $7-11$ | 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



|  | First | Last | Most LOHR | Year <br> Most | Career |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Player | LOHR | LOHR | S-S | LOHR | LOHR |
| Derek Jeter | 1996 | 2004 | 4 | 2001 | 13 |
| Terry Puhl | 1978 | 1982 | 5 | 1980 | 13 |
| Joe Morgan | 1965 | 1983 | 4 | 1965 | 13 |
| Al Bumbry | 1973 | 1984 | 3 | 1979 | 13 |
| Bert Campaneris | 1964 | 1972 | 6 | 1970 | 13 |
| Tom Brown | 1883 | 1896 | 3 | 1883 | 13 |
| Brad Wilkerson | 2002 | 2004 | 9 | 2004 | 12 |
| Ichiro Suzuki | 2001 | 2004 | 5 | 2002 | 12 |
| Al Smith | 1954 | 1960 | 4 | 1955 | 12 |
| Oddibe McDowell | 1985 | 1990 | 4 | 1986 | 12 |
| Billy Bruton | 1954 | 1964 | 2 | 1954 | 12 |
| Steve Sax | 1982 | 1993 | 3 | 1988 | 12 |
| Rafael Furcal | 2001 | 2004 | 4 | 2002 | 11 |
| Ron Gant | 1988 | 1996 | 3 | 1989 | 11 |
| Claudell Washington | 1983 | 1989 | 5 | 1984 | 11 |
| Tommie Agee | 1967 | 1973 | 4 | 1969 | 11 |
| Darin Erstad | 1998 | 2000 | 4 | 1999 | 11 |
| Ralph Garr | 1973 | 1977 | 4 | 1974 | 11 |
| Mickey Rivers | 1974 | 1980 | 3 | 1977 | 11 |
| Willie Wilson | 1979 | 1988 | 4 | 1986 | 11 |
| Hardy Richardson | 1884 | 1889 | 3 | 1887 | 11 |
| George Wood | 1881 | 1889 | 3 | 1882 | 11 |
| Kal Daniels | 1986 | 1989 | 8 | 1987 | 10 |
| Al Martin | 1995 | 1999 | 6 | 1999 | 10 |
| Don Money | 1974 | 1976 | 4 | 1974 | 10 |
| Johnny Frederick | 1929 | 1932 | 4 | 1930 | 10 |
| Bill Doran | 1983 | 1991 | 3 | 1986 | 10 |
| Marvin Benard | 1996 | 2001 | 4 | 1999 | 10 |
| Doug Glanville | 1997 | 2003 | 3 | 2001 | 10 |
| Wally Moses | 1935 | 1947 | 4 | 1937 | 10 |
| Luis Polonia | 1987 | 2000 | 4 | 1999 | 10 |
| Earle Combs | 1927 | 1932 | 4 | 1932 | 10 |
| Tony Taylor | 1958 | 1973 | 3 | 1970 | 10 |
| Harry Hooper | 1910 | 1923 | 3 | 1913 | 10 |

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

| mLOHR | 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 | $1989 ; 2003$ |

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

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 l 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 no one 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 341 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 on all marathons. A more complete 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 this year? Which is "rarer," the 26 -

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inning major league record, 33-inning minor league record, or 45 -inning "other" category record? In this article we'll answer these questions.

## 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 1700's or early 1800s. But the record has been cluttered with games that were never played! At the Delaware County Fairgrounds in Manchester, lowa, 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 54inning 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.

Despite many inquiries, nobody could tell me the date of the game or the final score. 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 three other "marathons" which were never played: a 28 -inning 1948 amateur game in South Dakota, a 22-inning 1932 Mississippi Valley League game in lowa, 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.

In 1860, at the Agricultural Fairgrounds in Worcester, the Medway Unions and Upton Excelsiors played the longest game ever in the history of baseball: 172 innings over seven days! Final score: Upton 50, Medway 29, after 21:50 game time.

## LONGEST FICTIONAL MARATHON

The lowa Baseball Confederacy by W. P. Kinsella is the greatest baseball novel ever written. The Chicago Cubs came to Big Inning, lowa, July 4, 1908, to play an all-star team from the minor league lowa 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 MARATHONS

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 O. 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. William Wheaton's Team beat William Tucker's Team 5142. 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 record for longest game stood at 10 innings for seven years, until June 24 or 27, 1852, when the Gothams took 16 innings to beat the Knickerbockers 21-16 at Red House Grounds
in New York City. The first-ever extra-inning game under the new nine-inning rules may have been in Brooklyn on June 6, 1865. The Gothams scored in the ninth to tie Enterprise at 17. In the 13th, Enterprise scored one, but the Gothams scored two to win, 19-18. 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.

Old Comiskey hosted four marathons: an American Giants game in the Negro American League and three White Sox AL games, including the longest AL game ever played, 25 innings. Wrigley has hosted three. Other current major league parks that have hosted marathons include RFK and Shea with two apiece, and Yankee Stadium, Fenway, Angels Stadium, the Metrodome, McAfee Coliseum, and Pro Player Stadium with one apiece. The other 20 have never hosted a marathon.

## 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 21 st 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 just revoked, 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 experience many fun times while conducting research at 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," 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 over the Schaumberg Flyers 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 32 nd. 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 33 rd. 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 28 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. In Brooklyn, September 1, 1890, the Dodgers swept three from Pittsburgh, 10-9, 3-2, and 8-4, a total of 27 innings. In Baltimore, September 7, 1896, the Orioles swept three from Louisville, 4-$3,9-1$, and $12-1$ in eight innings, a total of 26 innings. And in Pittsburgh, October 2, 1920, the Pirates lost two out of three to Cincinnati, losing the first two, 13-4 and 7-3, and winning the third 6-0 in six innings, a total of 24 innings. There have been eight minor league tripleheaders; seven were sweeps.

There has never been a major league quadrupleheader or longer. 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 23 rd, and another of 50 minutes in the 24th, the game was suspended due to rain after $231 / 2$ 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 ChiefsClippers 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 $5: 15 \mathrm{p} . \mathrm{m}$. 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 for charity, 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?

How many games go into extra innings? My detailed research indicates less than $6 \%$ went into extra innings in the 1800 s, when late afternoon starting times resulted in many games being called due to darkness before ever having the opportunity to go into extra innings. Between $9 \%$ and $10 \%$ have gone into extra innings in the 1900s and 2000s. The average since 2000 is down to $8.2 \%$. The number of extra-inning games has been declining since the 1960s when it was $9.9 \%$; 1970s $9.7 \%$,

1980s $9.7 \%$, 1990s $9.0 \%$, 2000s $8.2 \%$. The recent decline can be attributed to higher scoring games.

Based on all this research, the best empirical data for percentage of extra-inning games is: $5.68 \%$ in the 1800 s, $9.16 \%$ 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 $10.01 \%$ of all games will go into extra innings.

## VISITING TEAM ADVANTAGE IN MARATHON-LAND?

Of all the 341 marathons found so far, 46 have been in the major leagues, 173 in the minor leagues, and 122 in the "other" category ( 42 school games, 38 amateur games, 38 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 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 in a minor league marathon was 1:46 in the 11th inning on September 7, 1990, at Greer Stadium in Nashville. The Omaha Royals defeated the Sounds 8-7 in 20 innings at 3:50 a.m. Old Comiskey saw the longest rain delay in a major league marathon, when the 14th was delayed 17 minutes in a 21 -inning game May 26, 1973.

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 every 4,294 games.

In 2004, with each team playing 81 home games, there were 2,430 regular season games, plus 34 (it could have been anywhere from 24 to 41) post-season games, so there were 2,464 games. Assuming 2,464 major league games per season, 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. What have we actually experienced recently? Over the past 10 years we should expect to have seen 6 major league marathons, but we actually have had only one, with an 8-year drought 1995-2002. The Cards defeated the Marlins 7-6 in 20 innings in Miami, April 27, 2003.

## 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 15 th. Note how had this game been played in Texas, the Rangers could not have scored more than four runs in the 15th.

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 5,006 innings in 194 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, 191213, 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 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 remain tied and 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 0.031 in the 15th. Smith's data for innings 10 and 12-17 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 0.027 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 $81 / 2$ innings (17 half-innings) per game in a game that does not go into extra innings, or a total of $0.487 \times 17=8.28$ 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 $0.048 / 8.28=$ 0.0058 , 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 $\mathrm{n}=$ 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. We previously determined this empirically to be 5.68\% in the $1800 \mathrm{~s}, 9.16 \%$ in $1900-48$, and $9.41 \%$ in 1949-2003. Our theoretical model predicts this should be $10.01 \%$. For predictions about the future, we use $10.01 \%$, or 0.1001 , for $T$.

Let $\mathbf{k}=$ the probability both teams will score the same number of runs in one inning. This is where we use the extensive databases mentioned earlier. 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 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 Woolner's 0.5606 for 1980-98.

Having made the required definitions, 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 game occurring, as we have already discussed, is empirically $\mathrm{T}=0.0941$, and theoretically $\mathrm{T}=0.103$. There are most likely several factors contributing to the discrepancy between our predicted theoretical value and the actual empirical data. In our estimation, the biggest one is that to build our model we assumed both teams are average, whereas in the real world on team may be above average and the other team may be below average, which would decrease the probability of a game going into extra innings. For details, see our article in the upcoming issue of By the Numbers published by the SABR Statistical Analysis Committee. For predictions regarding future games, we use $\mathrm{T}=0.103$.

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 $\mathrm{k}(\mathrm{n}-10)$.

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 independent events, and multiply them together:

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

Getting the correct value of $k$ is crucial to success of our model. Data gathered by Kevin Woolner, as well as common sense, suggests offensive powerhouse teams have a different scoring distribution than teams scoring few runs. One of the key features of our model is it takes as an input the average number of runs per inning that each team scores. The model agrees with Woolner's data showing the probability two teams score the same number of runs per inning goes down as offensive production increases, since one team is more likely to have a "breakout" inning and score a high number of runs. This also indicates the number of extra-inning games and their lengths should increase during eras when scoring is low, such as the Deadball Era. 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 0.5601 .

Our theoretical model can be used to predict several 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.

Ibelieve 100\% of 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 $4.46 \%$; actual data indicates it is $4.12 \%$. Our model predicted reality to within $0.34 \%$. Similarly, our model predicts the probability of a major league game going 16 innings to be $0.129 \%$; actual data shows it is $0.133 \%$. Our
model predicts the probability of a major league game going 22 innings to be $0.00373 \%$; 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 (beginning of the major leagues) through 2004, we should expect 53 major league marathons to have been played. In fact, there have been only 46 . We should expect a $48 \%$ chance to experience a major league marathon in any given season. We should expect 0.85 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 $10 \%$ 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 very soon have a major league game go 27 or more innings. The 26 -inning Boston game should be not 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. According to our theoretical model for the period 1877 (beginning of the minor leagues) through 2004, we should expect 379 minor league marathons. 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, or $46 \%$ of what the model predicts, and $53 \%$ of the number to be expected if the percentage of games that are marathons is the same in the minors as in the majors. I had predicted I would find about 50\% of minor league marathons.

We should expect 6.1 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 0.078 minor league games to have gone 33 innings. In fact, we have had one such game, which means our actual count is 13 times the expected count. So the 33 -inning
game may be very rare indeed.
We should expect a $99.0 \%$ chance we will have a minor league marathon in any given season, a $0.12 \%$ chance we will have a minor league game of 34 or more innings in any given season, a $1.18 \%$ chance of seeing a minor league game of 34 innings or more in any given decade, and an $8.5 \%$ 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 0.00000320 "other" category games to have gone 45 innings. We should expect 0.00000399 "other" category games to have gone 45 or more innings. In fact, we have had one game of 45 or more innings, which means our actual count of one is 312,500 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 55 years. There is a $95 \%$ chance we will see a major league game go 27 innings or more in the next 236 seasons. So the 84 -year old 26 -inning major league record, while rare, is not so rare that we should not expect to see it possibly broken someday soon.

There is a 50\% chance we will see a minor league game go 34 innings or longer in the next 450 years. There is a $95 \%$ chance we will see a minor league game go 34 innings or more in the next 1,947 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 47,350 years. There is a $95 \%$ chance we will see an "other" category game go 46 innings or more in the next 204,800 years, or just two-thirds 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.

## EPILOGUE

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.

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 even better, had the rules on simultaneous balks and wild pickoff throws not been changed recently and Bake 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, and three hours per nine innings, or 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,

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

| 101 | Ag. Fair Gds. | Boston, MA | 9/1859 | AMA | Medway Unions 100 Holliston Winthrops 71, susp. after 66 innings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 80 | Ag. Grounds | Worcester, MA | $\begin{aligned} & 10 / 11 / 1859 \\ & 10 / 12 / 1859 \end{aligned}$ | AMA | Upton Excelsiors 100 Medway Unions 56 (11:02), suspended after 6:02 |
| 30 |  | Janesville, WI | 8/10/1860 | AMA | Croft's Team 50 Hogan's Team 34 |
| 172 | Ag. Grounds | Worcester, MA | $\begin{aligned} & 9 / 25 / 1860 \\ & 9 / 26 / 1860 \\ & 9 / 27 / 1860 \\ & 9 / 28 / 1860 \\ & 10 / 1 / 1860 \\ & 10 / 4 / 1860 \\ & 10 / 5 / 1860 \end{aligned}$ |  | Upton Excelsiors 50 Medway Unions 29 (21:50), dinner/rain delay $0: 20$ bottom 13 th on 9/25, susp. on $9 / 25$ after $2: 40$ and 12.5 innings, rain delay 2:30 bottom 13 th on $9 / 26$, susp. on $9 / 26$ after 5:40 and 34.5 innings, lunch delay 0:20 on 9/27, susp. on 9/27 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 173 rd on $10 / 4$, susp. on 10/4 after $21: 50$ and 172 innings, rain delay top 173 r d on $10 / 5$ |
| 24 | Holmes Field | Cambridge, MA | 5/11/1877 | $\begin{aligned} & \text { IA/ } \\ & \text { ICA } \end{aligned}$ | Manchester Pros 0 Harvard Crimson 0 (3:30) |
| 22 | 11th St. Grounds | Tacoma, WA | 5/16/1891 | PNW | Tacoma Daisies 6 Seattle Blues 5 (3:35) |
| 25 | Militia Grounds | Devils Lake, ND | 7/18/1891 | RRV | Grand Forks Forkers 0 Fargo Graingrowers 0 (4:10) |
| 20 | League Park (I) | Cincinnati, OH | 6/30/1892 | NL | Colts 7 Reds 7 (3:20) |


| 21 | Lake View Park | Peoria, IL | 6/26/1898 | WA | Peoria Blackbirds 8 St. Joseph Saints 4 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 20 | Old Fair Grounds | Springfield, MI | 7/19/02 | MOV | Springfield Reds 2 Nevada Lunatics 1 (5:00) |
| 20 | Driving Park | Kingston, NY | 8/10/03 | HUD | Hudson Marines 2 Kingston Colonials 2 |
| 23 | Goodwater Grove | Stockton, CA | 7/2/05 | CAS | Stockton Millers 1 Lodi Crushers 0 ( $3: 26$ ) |
| 20 | Huntington Gds. | Boston, MA | 7/4/05 | AL | Athletics 4 Americans 2 (3:31) |
| 20 | Huntingdon Gds. | Phila., PA | 8/24/05 | NL | Cubs 2 Phillies 1 (4:00) |
| 20 | Electric Park | Monessen, PA | 1906 | AMA | Glassport Athletic 4 Monessen East Ends 3 |
| 24 | Huntington Gds. | Boston, MA | 9/1/06 | AL | Athletics 4 Americans 1 (4:47) |
| 20 |  | Joplin, MO | 9/4/06 | WA | Joplin Miners 0 Webb City Gold Bugs 0 ( $3: 15$ ) |
| 20 | Washington Park | Lowell, MA | 4/27/07 | NEL | Haverhill Hustlers 1 Lowell Tigers 1 (3:25) |
| 23 | Athletic Park | Hutchinson, KS | 5/29/07 | WA | OK City Mets 2 Hutchinson Salt Packers 1 ( $3: 10$ ) |
| 28 | Franklin Field | Boston, MA | 6/8/07 | GRM | Pierce School (Dorchester) 4 Bennet School (Brighton) 3 (5:50) |
| 21 |  | Jacksonville, IL | 6/26/07 | IAS | Jacksonville Lunatics 3 Burlington Pathfinders 2 (3:05) |
| 30 | Brookside Park | Cleveland, OH | 7/4/07 | AMA | Brooklyn Athletic 4 East End All Stars 1 (5:50) |
| 36 | Rec. Park (I) | Columbus, OH | 7/5/07 | AMA | Heintz Victors 2 Columbus Selects 2 (3:50) |
| 23 |  | Green Bay, WI | 7/14/07 | WIS | Green Bay Orphans 2 La Crosse Badgers 1 (4:05) |
| 20 | Webb Park | Marion, OH | 7/20/07 | OPL | Mansfield Pioneers 2 Marion Moguls 1 (2:18) |
| 22 | Ringwood Park | Clinton, IA | 7/25/07 | I I I | Peoria Distillers 3 Clinton Infants 0 ( $3: 10$ ) |
| 21 |  | Johnstown, PA | 8/8/07 | TRI | Johnstown Johnnies 4 Reading Pretzels 3 ( $3: 45$ ) |
| 24 |  | Newark, OH | 8/23/07 | OPL | Sharon Giants 3 Newark Newks 2 |
| 22 |  | Schaller, IA | 1908 | AMA | Sac City 3 Schaller 3 |
| 20 |  | Aberdeen, WA | 5/6/08 | NWN | Butte Miners 3 Aberdeen Black Cats 3 (3:45) |
| 23 | N. Corry Fgds. | Corry, PA | 6/25/08 | AMA | Falconer 3 Corry 1 (3:50) |
| 20 |  | $\mathrm{n} / \mathrm{a}$ | 6/30/08 | SMA | Saginaw Wa-was 5 Jackson Convicts 4 |
| 21 |  | Vincennes, IL | 7/18/08 | EIL | Charleston Evangelists 4 Vincennes Alices 3 |
| 21 | Athletic Gds. | Sheboygan, WI | 7/19/08 | LAL | Sheboygan Chairmakers 1 Mil. White Sox 0 ( $3: 40$ ) |
| 20 | Vaughn Ballpark | Portland, OR | 8/2/08 | PCL | SF Seals 6 Portland Beavers 5 (3:40) |
| 23 |  | Fond du Lac, WI | 8/4/08 | WI | Oshkosh Indians 4 Fond du Lac Cubs 2 ( $3: 40$ ) |
| 20 |  | Jacksonville, IL | 9/3/08 | CA | Jacksonville Lunatics 4 Ottumwa Packers 1 (2:50) |
| 26 | Bloomington Gds. | Bloomington, IL | 5/31/09 | I I I | Decatur Commodores 2 Bloomington Bloomers 1 <br> (4:20), rain delay $0: 15$ bottom 5 th |
| 24 | Freeman's Park | San Fran., CA | 6/8/09 | PCL | SF Seals 1 Oakland Oaks 0 (3:35) |
| 26 | Athletic Park | Dixon, IL | 6/25/09 | SMP | Dixon Browns 3 Muscatine Independents 2 (4:00) |
| 21 |  | McPherson, KS | 7/27/09 | KSS | Lyons Lions 2 McPherson Merry Macks 1 (2:50) |
| 22 | Recreation Park | Vancouver, BC | 7/31/09 | NWN | Portland Colts 3 Vancouver Beavers 0 ( $3: 08$ ) |
| 21 | Athletic Grounds | Sheboygan, WI | 6/5/10 | LAL | Sheboygan Chairmakers 2 Port Washington 1 |
| 24 |  | Clarksburg, WV | 7/3/10 | WVA | Mannington Mountaineers 1 Clarksburg Bees 1 |
| 23 | League Park | San Antonio, TX | 7/5/10 | TX | Waco Navigators 1 San Antonio Bronchos 1 (4:14) |
| 21 | Springbrook Pk. | South Bend, IN | 7/13/10 | CTR | S. Bend Bronchos 1 Zanesville Potters 0 ( $3: 35$ ) |
| 20 |  | Muscatine, IA | 7/16/10 | 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 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 | $\begin{aligned} & \text { TX0/ } \\ & \text { TX } \end{aligned}$ | 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 Pk. | Los Angeles, CA | 9/15/11 | PCL | Sacramento Sacts 4 Los Angeles Angels 4 ( $3: 10$ ) |
| 20 |  | $\mathrm{n} / \mathrm{a}$ | 1912 or 1913 | HS | East Berlin vs. New Berlin |
| 20 |  | $\mathrm{n} / \mathrm{a}$ | 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 Pk. | 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 Pk. | Los Angeles, CA | 5/27/14 | PCL | Oakland Oaks 4 Venice Tigers 2 (4:02) |
| 20 | Nicollet Pk. | Minneapolis, MN | 6/9/14 | AA | Minn. Millers 3 Louisville Colonels 2 (3:31) |
| 23 | Athletic Park | 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 |  | Delaware Cty, 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 Pk. (II) | Seattle, WA | 7/19/14 | NWN | Spokane Indians 6 Seattle Giants 1 (3:03) |
| 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 |  | n/a | 9/4/15 | VAL | Norfolk Tars 3 Suffolk Tigers 3 |
| 22 | Douglas Park | Rock Isl., 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 |  | Lincoln, NE | 8/12/17 | WL | 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 (II) | 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 | M0 | London Cockneys 5 Hamilton Tigers 4 |
| 20 | Hampden Pk. (II) | Springfield, MA | 8/28/20 | EL | Albany Senators 5 Springfield Hampdens 5 |
| 22 | Washington Pk. | Los Angeles, CA | 4/10/21 | PCL | Seattle Rainiers 12 Los Angeles Angels 8 (4:46) |
| 20 | Hanlan's Pt. (III) | Toronto, ON | 6/2/21 | IL | Buffalo Bisons 3 Toronto Maple Leafs 2 |
| 22 | Stonewall Jackson | 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 |  | $\mathrm{n} / \mathrm{a}$ | 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 | Providence, RI | 6/7/24 | NCA | Providence Friars 1 Brown Bears 0 (4:00) |
| 20 | Ace Park | Saginaw, MI | 7/12/24 | M0 | Flint Vehics 3 Saginaw Aces 2 |
| 23 |  | $\mathrm{n} / \mathrm{a}$ | 1926 | HS | Pomona Red Devils 6 Fullerton Indians 5 |
| 25 |  | Pacific Junc., 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 8 (3:30) |

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| 21 | Comiskey Park (I) | Chicago, IL | 5/24/29 | AL | Tigers 6 White Sox 5 ( $3: 31$ ) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 21 |  | n/a | 1930 | NCA | U. Miami Redskins def. U. Cincinnati Bearcats |
| 20 | Wrigley Field | Chicago, IL | 8/28/30 | NL | Cardinals 8 Cubs 7 (4:10) |
| 20 |  | IA | $\begin{aligned} & \text { between } \\ & 5 / 14 / 31 \text { \& } \\ & 5 / 31 / 31 \\ & \hline \end{aligned}$ | MIV | Cedar Rapids Bunnies def. Dubuque Tigers |
| 22 |  | Elyria, OH | $\begin{aligned} & 8 / 1 / 1932 \\ & 8 / 8 / 1932 \end{aligned}$ | AMA | K of P's Team A 19 K of P’s Team B 19, susp., completed on 8/8 with 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 | Honolulu 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 | Braves Field | 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 | Braves Field | Boston, MA | 7/5/40 | NL | Dodgers 6 Bees 2 ( $5: 19$ ) |
| 21 | Texas Lg. Park | Oklahoma City, OK | 9/5/40 | TX | Dallas Rebels 2 Oklahoma City Indians 1 (3:58) |
| 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 | 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 | $\begin{aligned} & \text { MIL/ } \\ & \text { NCA } \\ & \hline \end{aligned}$ | Notre Dame Fighting Irish 1 Indianapolis Stout Fld 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 Beavers Stad. | Portland, OR | 5/7/47 | PCL | Portland Beavers 1 Sacramento Solons 0 (3:25) |
| 20 |  | n/a | 5/15/47 | HS | Newtown HS 3 Bryant HS 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 | 7/10/49 | N1D | Navarro Cubs 4 Escuelas Internacionales 3 (6:30) |
| 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 | late 40s | N2D | Manta Nica defeated Schumann (6:13) |
| 20 |  |  | 7/13/50 | BIG | Wichita Falls Spudders 2 Sherman-Denison Twins 1 |
| 22 | Red Wing Stadium | Rochester, NY | 8/13/50 | IL | Red Wings 3 Jersey City Giants 2 (5:15) |


| 23 | Royal Park | Victoria, BC | 5/5/51 | WIN | Salem Senators 1 Victoria Athletics 0 (4:03) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 20 |  | $\mathrm{n} / \mathrm{a}$ | 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 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 | 7/3/52 | CTR | All-Stars 2 Pacific League 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 |  |  | 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) |
| 21 |  | Stuart, FL | 5/24/53 | SFG | Jupiter 1 Stuart 1 |
| 22 | Seals Stadium | San Fran., CA | 8/5/53 | PCL | Portland Beavers 4 San Francisco Seals 2 (4:20) |
| 21 |  |  | 9/19/53 | 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 Lg. 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) |
| 20 | Lucky Beavers Stad. | Portland, OR | 4/24/55 | PCL | Portland Beavers 3 San Diego Padres 2 (4:14) |
| 20 | Centennial Field | Burlington, VT | 5/30/55 | PVC | 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 | 7/19/56 | 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) |
| 21 | Municipal Stadium | Jacksonville, FL | 4/22/59 | SAL | J'ville Braves 3 Knoxville Smokies 2 (5:01) |
| 29 | Nishi-Kyogoku | 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 |  |  | 7/17/60 | MXC | Aguascalientes Tigres 5 Leon Diablos Rojos 4 |
| 20 |  |  | 1962 | HS | Orange HS 7 Santa Ana HS 6 |
| 20 | Honolulu 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) |
| 22 | Korakuen | 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 |  | Fond du Lac, WI | 7/31/63 | FRV | Little Chute-Kimberly 11 Fond du Lac 5 (6:01) |
| 20 | Municipal Park | Sanford, FL | 4/17/64 | $\begin{aligned} & \text { EL/ } \\ & \text { NYP } \end{aligned}$ | Williamsport Mets at Auburn Mets |
| 22 | Wesleyan Field | Owensboro, KY | 4/20/64 | NCA | Wesleyan Panthers 8 Oakland 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 Field (I) | Paramus, NJ | 6/19/65 | 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 | College Stadium | Jamestown, NY | 8/14/65 | NYP | Binghamton Triplets 4 Jamestown Tigers 4 (6:13) |
| 20 |  | Decatur, IL | 8/20/65 | MWL | Decatur Commodores 1 Fox Cities Foxes 0 ( $4: 25$ ) |
| 20 |  | Havana, Cuba | 12/28/65 | CUB | 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 | $\begin{aligned} & 7 / 25 / 66 \\ & 8 / 28 / 66 \end{aligned}$ | 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) |
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| 23 | Lawrence Hardball | Lodi, CA | 8/31/66 | CAL | Reno Silver Sox 6 Lodi Crushers 5 (6:00) |
| 20 | Lawrence Stad. | 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 | Metropolitan Stad. | 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 | 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 |  | n/a | 1969 | LEG | Siler City Post vs. Bethel Post |
| 22 | D. del Seguro Social | Mexico City | 7/14/69 | MX | Reynosa Broncos 5 Mexico City 3 |
| 20 | Sicks Stadium | Seattle, WA | 7/27/69 | AL | Red Sox 5 Pilots 3 (5:52) |
| 24 | Flamingo Park | Miami Bch, FL | 4/23/70 | HS | Miami Stingarees 1 Hialeah Thoroughbreds 0 (5:16) |
| 23 | All-Sports Stad. | Okla. City, OK | $\begin{aligned} & 5 / 28 / 70 \\ & 5 / 29 / 70 \end{aligned}$ | 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 | Tokyo, Japan | 6/24/70 | JUL | Kansai Univ 3 Hosei Univ 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 | $\begin{aligned} & 6 / 19 / 71 \\ & 6 / 20 / 71 \end{aligned}$ | CAL | Visalia Mets 11 Bakersfield Dodgers 9 (7:00), susp. after 4:50 and 15 innings |
| 20 | Oakland-Alameda | 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 | $\begin{aligned} & 9 / 14 / 71 \\ & 9 / 20 / 71 \end{aligned}$ | AL | Senators 8 Indians 6 (6:15), susp. after 5:00 and 16 innings in Cleveland, completed 9/20 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 U. Florida Gators 6 |
| 20 | Coleman Field | Corvallis, OR | 5/6/72 | NCA | U. Wash. Huskies 2 Oregon State Beavers 1 |
| 22 | Metropolitan Stadium | Bloomington, MN | $\begin{aligned} & 5 / 12 / 72 \\ & 5 / 13 / 72 \end{aligned}$ | AL | Brewers 4 Twins 3 (5:47), susp. after 5:35 and 21 innings |
| 20 | University Field | Amherst, MA | 5/13/72 | NCA | UConn Huskies 9 UMass Minutemen 3 ( $5: 10$ ) |
| 20 |  | Havana, Cuba | 1/21/73 | CUB | Azucarerors vs. Camaguey. |
| 20 | Blair Field | Long Beach, CA | 3/30/73 | NCA | Cal State Univ at San Jose Spartans 1 Cal State Univ at Long Beach 49ers 1 in 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 |  | IL | 5/23/73 | HS | Mt. Olive Wildcats 0 Staunton Bulldogs 0 (4:05) |
| 21 | Comiskey Park (I) | Chicago, IL | $\begin{aligned} & 5 / 26 / 73 \\ & 5 / 28 / 73 \end{aligned}$ | AL | White Sox 6 Indians 3 in 6:03, rain delay 0:17 top 14 th, suspended after $4: 39$ and 16 innings |
| 22 | NU Diamond | Lincoln, NE | 4/26/74 | NCA | Univ of Colorado Buffaloes 2 Univ of 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 | CUB | Camaguey Granjeros vs. Camaguey Ganaderos, susp. |
| 20 |  |  | 1975 | HS | Homewood-Flossmoor Vikings vs. Olympia Fields Rich Central Olympians |
| 21 | Estadio H. 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) |
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| 20 |  | Arlington, MN | 8/26/76 | TT | Cyrus 2 Fairfax Indians 1 (4:35) |
| 22 |  | Havana, Cuba | 1/25/77 | CUB | Vegueros vs. Santiago Mineros |
| 23 | Estadio Cordoba | Cordoba, Mexico | 4/28/77 | MX | Aguascalientes Rieleros 6 Cordoba Cafeteros 2 in 6:30 |
| 21 | Stade Olympique | Montreal, QB | 5/21/77 | NL | Padres 11 Expos 8 (5:33) |
| 21 |  |  | 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 | Nido de las Aguilas | Mexicali, MX | 1/2/79 | MXP | Navojoa Mayos 1 Mexicali Aguilas 0 |
| 20 |  |  | 1979 | HS | Meridian HS Wildcats 4 Corinth HS Warriors 3 |
| 21 | Taipei Municipal | Taipei, Taiwan | 9/15/79 | TAI | Weiquan Univ 1 Putaowang Furen Univ 0 (6:06) |
| 21 | Hickey Park | Russellville, AR | 5/14/80 | HS | Hazen Hornets 8 Tuckerman 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 | Jesus Carranza | Guasave, MX | 11/11/80 | MXP | Mexicali Aguilas 3 Guasave Algodoneros 1. |
| 33 | McCoy Stadium | Pawtucket, RI | $\begin{aligned} & 4 / 18 / 81 \\ & 6 / 23 / 81 \end{aligned}$ | 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 | $\begin{aligned} & 5 / 15 / 81 \\ & 5 / 16 / 81 \end{aligned}$ | NCA | U. Texas Longhorns 7 Rice Univ Owls 6 (6:07), rain delay 2:00 top 13 th, suspended after 3:10 and 12 innings |
| 20 |  |  | 5/17/81 | NIW | Corinto 5 Leon 4 |
| 23 | Fort Lauderdale | Ft. Lauderdale, FL | $\begin{aligned} & 5 / 24 / 81 \\ & 5 / 25 / 81 \end{aligned}$ | FLS | Ft. Lauderdale Yankees 1 Tampa Tarpons 0 (5:32), susp. after 5:23 and 22 innings |
| 20 | Thunderbird Park | Cedar City, UT | 5/19/81 | NAIA | 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 | $\begin{aligned} & 9 / 3 / 81 \\ & 9 / 4 / 81 \end{aligned}$ | AL | Mariners 8 Red Sox 7 (6:01), susp. after 5:39 and 19 innings |
| 20 | Anaheim Stadium | Anaheim, CA | $\begin{aligned} & 4 / 13 / 82 \\ & 4 / 14 / 82 \end{aligned}$ | 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 | $\begin{aligned} & \hline 8 / 12 / 82 \\ & 8 / 13 / 82 \end{aligned}$ | SAL | Greensboro Hornets 3 Gastonia Cardinals 2, suspended after 17 innings. |
| 21 | Wrigley Field | Chicago, IL | $\begin{aligned} & 8 / 17 / 82 \\ & 8 / 18 / 82 \end{aligned}$ | NL | Dodgers 2 Cubs 1 (6:10), susp. after 5:10 and 17 innings |
| 21 | Community Field (II) | Burlington, IA | $\begin{aligned} & 8 / 10 / 83 \\ & 8 / 11 / 83 \end{aligned}$ | MWL | Burlington Rangers 7 Clinton Giants 6 in 5:44, rain delay 0:06 bottom 11th, 2nd rain delay 0:00 bottom 18th, suspended after $4: 54$ and $171 / 2$ innings |
| 45 | Ibaraki-Mito Kenai | Mito, Japan | 9/20/83 | AMA | Amateur Industrial Emperor's Cup Nan-shiki Tournament -- Tokyo Raito Kogyo 2 Miyazaki Tanaka Byouin 1 in 8:19, umpire snack break delay 0:06 top 26th, players refused 0:30 break top 26th. |
| 23 |  |  | 12/18/83 | NIW | Leon 5 Rivas 4 |
| 25 | Comiskey Park (I) | Chicago, IL | $\begin{aligned} & 5 / 8 / 84 \\ & 5 / 9 / 84 \end{aligned}$ | AL | White Sox 7 Brewers 6 in 8:06, suspended after 5:29 and 17 innings |
| 21 | J. C. Love Field | Ruston, LA | 2/16/85 | NAIA | Louisiana Tech Univ Bulldogs 2 Southern Arkansas Univ Muleriders 1 in 4:54 |
| 21 | Cooper Stadium | Columbus, OH | $\begin{aligned} & 6 / 10 / 85 \\ & 6 / 11 / 85 \\ & 6 / 12 / 85 \end{aligned}$ | 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 | $\begin{aligned} & 6 / 19 / 85 \\ & 6 / 20 / 85 \\ & 6 / 21 / 85 \end{aligned}$ | 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 24 th, susp. again after $6: 07$ and 23.5 innings, completed 6/21 |
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| 21 | Fort Lauderdale | Ft Lauderdale | 7/11/85 | FLS | Miami Marlins at Fort Lauderdale Yankees |
| 20 | Mayo Field | Rochester, MN | $\begin{aligned} & 5 / 10 / 86 \\ & 5 / 20 / 86 \end{aligned}$ | 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 | JCA | 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) |
| 20 | Al Lang Field Holman Stadium | St. Petersburg Vero Beach, FL | $\begin{aligned} & 4 / 29 / 88 \\ & ? / ? ? / 88 \end{aligned}$ | FLS | Vero Beach Dodgers at St. Petersburg Cardinals, susp. after 5:29 and 18 innings, completed in Vero Beach |
| 21 | Riverside | Riverside, CA | 5/22/88 | CAL | San Jose Giants 8 Riverside Red Wave 5 (6:19) |
| 27 | Burlington 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 Wheelers 7 Fayetteville Generals 5 |
| 26 | Keefe Stadium | San Antonio, TX | $\begin{aligned} & 7 / 14 / 88 \\ & 7 / 16 / 88 \end{aligned}$ | TX | San Antonio Missions 1 Jackson Mets 0 (7:23) susp. after 7:10 and 25 innings |
| 21 | Emilio Ibarra | Los Mochis, MX | 11/26/88 | MXP | Los Mochis Caneros 4 Mazatlan Venados 2 (7:14) |
| 23 | Y. Sola Morales | Caguas, PR | $\begin{aligned} & 1 / 8 / 89 \\ & 1 / 9 / 89 \end{aligned}$ | PRW | Mayaguez Indios 4 Caguas Criollos 3, susp. |
| 22 | Parry Field | Belmont | 3/17/89 | WOZ | Melville Braves 6 Morley Eagles 2 in 5:23 |
| 21 | Smith Stadium | Sarasota, FL | $\begin{aligned} & 4 / 24 / 89 \\ & 5 / 17 / 89 \end{aligned}$ | FLS | Dunedin Blue Jays 8 Sarasota White Sox 3 in 6:29, suspended after 5:48 and 20 innings |
| 20 | Community Field (II) | Burlington, IA | 5/15/89 | MWL | Rockford Expos 4 Burlington Braves 2 in 5:04 |
| 22 | Astrodome | Houston, TX | 6/3/89 | NL | Astros 5 Dodgers 4 in 7:14 |
| 25 | Waterloo Stadium Clinton Stadium | Waterloo, IA Clinton, IA | $\begin{aligned} & 7 / 6 / 89 \\ & 8 / 17 / 89 \end{aligned}$ | MWL | Waterloo Diamonds 4 Clinton Giants 3 in 7:37, suspended after 5:46 and 19 innings in Waterloo, completed $8 / 17$ in Clinton |
| 21 | Diamond | Richmond, VA | 8/7/89 | IL | Toledo Mud Hens 4 Richmond Braves 1 |
| 25 | Memorial Stadium Civic Stadium | Everett. OR Eugene, OR | $\begin{aligned} & 8 / 18 / 89 \\ & 8 / 24 / 89 \end{aligned}$ | NW Lg | Eugene Emeralds 6 Everett Giants 5 in 7:13, suspended after 5:50 and 19 innings in Everett, completed 8/24 in Eugene |
| 22 | Stade Olympique | Montreal, QB | 8/23/89 | NL | Dodgers 1 Expos 0 in 6:14 |
| 20 | Keehi Lagoon | Honolulu, HI | 4/13/90 | NAIA | Hawaii Pac Univ Sea Warriors 6 Coll of Idaho 5 |
| 20 | Municipal Stadium | Phoenix, AZ | 6/23/90 | PCL | Calgary Cannons 12 Phoenix Firebirds 9 |
| 20 | Greer Stadium | Nashville, TN | 9/7/90 | AA | Omaha Royals 8 Nashville Sounds 7 in 6:25 and 20 innings, rain delay $1: 46$ bottom 11 th |
| 20 | McCarver Stadium | Memphis, TN | $\begin{aligned} & 6 / 17 / 91 \\ & 6 / 18 / 91 \end{aligned}$ | SL | Huntsville Stars 9 Memphis Chicks 7 in 6:32, suspended after 5:33 and 16 innings |
| 22 | Ojiyama Kyujyo | Otsu, Japan | 5/4/93 | JUL | Kihara Univ 3 Chikaoka Univ 2 in 4:45 |
| 20 | 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 in 4:47 |
| 20 | Veterans Stadium | Phila., PA | 7/7/93 | NL | Phillies 7 Dodgers 6 in 6:10 |
| 22 | Metrodome | Minneapolis, MN | 8/31/93 | AL | Twins 5 Indians 4 in 6:17 |
| 22 | Teodoro Mariscal | Mazatlan, MX | 10/26/93 | MXP | Mazatlan Venados 2 Guasave Algodoneros 1 in 7:02 |
| 24 |  | Havana, Cuba | $\begin{aligned} & 12 / 8 / 93 \\ & 12 / 9 / 93 \end{aligned}$ | CUB | Matanzas vs. Habana, suspended |
| 20 | Lang Field | St. Pete, FL | 4/14/94 | FLS | St. Pete Cardinals 8 Lakeland Tigers 7 (7:07) |
| 25 | Y. Sola Morales | Caguas, PR | $\begin{aligned} & 11 / 23 / 94 \\ & 12 / 10 / 94 \\ & \hline \end{aligned}$ | PRW | Mayaguez Indios 4 Caguas Criollos 3, susp. after 16 innings |
| 20 | Oaks Oval | Lismore | 12/31/94 | A19 | Australia 9 Chinese Taipei 8 (6:17) |

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| 21 | Municipal Stad. | San Jose, CA | $\begin{aligned} & 5 / 12 / 95 \\ & 5 / 13 / 95 \end{aligned}$ | CAL | San Bernardino Spirit 1 San Jose Giants 0, suspended |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 23 | Legion Field | Downers Grove, IL | $\begin{aligned} & 4 / 28 / 95 \\ & 5 / 3 / 95 \\ & 5 / 8 / 95 \\ & 5 / 12 / 95 \end{aligned}$ | HS | Downers Grove 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 |
| 20 | Angel Flores | Culiacan, Mexico | 10/27/95 | MXP | Culiacan Tomateros 3 Mazatlan Venados 2 (6:01) |
| 24 | Estadio Isidoro ìCholô̂ Garcia | Mayaguez, PR | $\begin{aligned} & 12 / 22 / 95 \\ & 12 / 23 / 95 \\ & 1 / 19 / 96 \end{aligned}$ | PRW | Mayaguez Indios 2 San Juan Senadores 1, susp., suspended a second time. |
| 21 | Blue Valley | Overland Pk, KS | 5/20/97 | HS | Blue Valley Huskies 1 Shawnee Mission Mustangs 0 |
| 21 | Johnson Field | Wilmington, DE | 7/5/98 | CAR | Wilmington Blue Rocks 3 Danville 97is 2 in 6:23 |
| 23 | Municipal Stadium | Greenville, SC | $\begin{aligned} & 8 / 6 / 98 \\ & 8 / 7 / 98 \end{aligned}$ | SL | Greenville Braves 10 Huntsville Stars 7 in 6:26, suspended after 5:25 and 19 innings |
| 22 | Cougar Field | Houston, TX | 2/21/99 | NCA | Baylor Univ Bears 8 Univ of Houston Cougars 2 in 6:43 |
| 21 | Carson Center | Evansville, IN | 3/7/99 | NCA | Univ of Memphis Tigers 4 Univ of Evansville Purple Aces 4 in 5:00 |
| 21 | O'Donnell Stadium | Davenport, IA | 5/19/99 | MWL | Clinton Lumber Kings 3 Quad-City River Bandits 2 in 5:49 |
| 100 |  | Silver Spring, <br> MD | 1990 | HS | Springbrook vs. another HS in 24:00, planned marathon |
| 100 |  | Fort Sheridan, IL | $\begin{aligned} & 9 / ? ? / 99 \\ & 9 / ? / 99 \end{aligned}$ | HS | Green Sox vs. Snappers in 24:00, to raise funds for Australia trip |
| 20 | Frans Stadium | Hickory, NC | 8/13/00 | SAL | Asheville Tourists def. Hickory Crawdads (5:16) |
| 21 |  | Brunswick, OH | $\begin{aligned} & 5 / 9 / 2001 \\ & 5 / 10 / 2001 \end{aligned}$ | HS | Brunswick 11 Elyria Pioneers 10 |
| 23 | Estadio Veracruz | Veracruz, MX | 6/30/01 | MX | Mexico City 2 Veracruz Aguila 1 |
| 22 |  | Puerto Rico | 11/4/01 | PRW | Carolina Giantes 2 Caguas Criollos 1 |
| 23 | Fukuoka Dome | Fukuoka, Japan | 10/26/02 | JUL | Nihon Bunri Univ 2 Kyushu Kyoritsu Univ 1 |
| 22 | Blacktown Park | Sydney, Aust. | 4/19/03 | NSW | Queensland 4 Combined Academy 3 (5:33) |
| 20 | Pro Player Stad. | Miami, FL | 4/27/03 | NL | Cardinals 7 Marlins 6 (6:07) |
| 21 | Dwyer Stadium | Batavia, NY | 7/9/03 | NYP | S.I. Yankees 5 Batavia Muckdogs 2 (5:48) |
| 20 | Eldredge Park | Orleans, MA | 8/4/03 | CCL | Harwich Mariners 3 Orleans Cardinals 2 (5:52) |
| 79 | Carroll Field | Wichita, KS | 10/5/03 | NAIA | Red Team 15 Black Team 14 (8:00) |
| 65 | Electric Park | Tucson, AZ | $\begin{aligned} & 10 / 18 / 03 \\ & 10 / 19 / 03 \end{aligned}$ | AMA | African Gray Birds 127 Red-Eyed Nites 110 (24:12). Women's Marathon 24 Hours for Africa |
| 20 | Myers Field | Manhattan, KS | 4/9/04 | NCA | Texas Longhorns 10 Kansas Wildcats 6 (6:28) |
| 24 |  | Norridge, IL | $\begin{aligned} & 5 / 18 / 04 \\ & 5 / 25 / 04 \end{aligned}$ | HS | Evergreen Park HS Mustangs 1 Ridgewood HS Rebels 0 , suspended after 12 innings. |
| 21 | Wolff Stadium | San Antonio, TX | 8/14/04 | TX | Midland RockHounds 7 San Antonio 5 in 6:40 |
| 23 | Dust Devils Stadium | Pasco, WA | $\begin{aligned} & 8 / 16 / 04 \\ & 8 / 17 / 04 \end{aligned}$ | NWL | Spokane Indians 2 Tri-City Dust Devils 1 in 6:37, suspended after 5:46 and 20 innings |
| 100 | Carroll Field Love Field | Wichita, KS | $\begin{aligned} & 10 / 10 / 04 \\ & 10 / 12 / 04 \end{aligned}$ | NAIA | Red Team 20, Black Team 17 (8:30), susp. due to rain after 5:00 and 64 innings |



| Inning | 2-Inning <br> Datapoints | Runs per 2-Inning |
| :---: | :---: | :---: |
| 1 | 245,812 | . 561 |
| 2 | 245,812 | . 431 |
| 3 | 245,812 | . 491 |
| 4 | 245,812 | . 497 |
| 5 | 245,812 | . 491 |
| 6 | 245,446 | . 507 |
| 7 | 244,856 | . 493 |
| 8 | 244,088 | . 486 |
| 9 | 243,394 | . 433 |
| 10 | 23,026 | . 399 |
| 11 | 12,906 | . 398 |
| 12 | 7,220 | . 385 |
| 13 | 4,044 | . 396 |
| 14 | 2,282 | . 397 |
| 15 | 1,240 | . 392 |
| 16 | 704 | . 380 |
| 17 | 378 | . 384 |
| 18 | 202 | . 302 |
| 19 | 116 | . 440 |
| 20 | 362 | . 287 |
| 21 | 224 | . 299 |
| 22 | 142 | . 338 |
| 23 | 88 | . 239 |
| 24 | 60 | . 150 |
| 25 | 46 | . 130 |
| 26 | 32 | . 156 |
| 27 | 24 | . 250 |
| 28 | 18 | . 111 |
| 29 | 14 | . 143 |
| 30 | 10 | . 300 |
| 31 | 8 | . 250 |
| 32 | 8 | . 250 |
| 33 | 6 | . 167 |
| 34 | 4 | . 000 |
| 35 | 4 | . 500 |
| 36 | 4 | . 000 |
| 37 | 2 | . 000 |
| 38 | 2 | . 000 |
| 39 | 2 | . 000 |
| 40 | 2 | . 000 |
| 41 | 2 | . 000 |
| 42 | 2 | . 000 |
| 43 | 2 | . 000 |
| 44 | 2 | . 000 |
| 45 | 2 | . 500 |

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:

| 10 | 362 | .022 |
| :--- | ---: | :---: |
| 11 | 362 | .044 |
| 12 | 362 | .028 |
| 13 | 362 | .022 |
| 14 | 362 | .006 |
| 15 | 362 | .033 |
| 16 | 362 | .006 |
| 17 | 362 | .017 |
| 18 | 362 | .039 |
| 19 | 362 | .072 |
| $20-45$ | see above | see above |

# 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

[^0]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 clutchhitting 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 ondeck 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 righthanded 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 lefthanders. 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 nothingnessand I did the same, many times, and many other people also have done the same. But l'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. 0K, 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 (?) (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 arguingor 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 

$t$ 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 immediately and vehemently protested, saying that Northey

## BIO NEEDED

had been deceived by Reardon. The consensus in the press box and from the umpires (in later testimony) was that the slowfooted 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 doubleheader 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. Such a position 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, Inc." The Dodgers won both that day, by scores of 7-5 and 12-3.

## Identifying Mystery Photos

0ne 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.

## BIO NEEDED

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 BrookIyn pitcher Vic Lombardi. Umpire AI Barlick prepares to make the call. This photograph-and all of the photos used in this article-appear courtesy of the George Michael Collection.

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:


## WHAT CRACKED THE CASE

Going through the box scores of CardinalDodger 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.

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## 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:


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 headfirst 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.

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 PostDispatch." Well, that's certainly Pepper Martin. But see what else I divined from this photograph:


Checking every Cardinals-Pirates box score from 1933 to 1935 with Martin involved in a play at third base, with a crowd of 20,00023,000. 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:
 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:


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:


## 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.

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.

The Yankees' striped socks are from 1908-1909.

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


## 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.


## 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.

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.


## 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.

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.


## 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:


## 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, nowalks, 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,

[^1]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 $51 / 3$ 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
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 ( $111 \mathrm{Ks}, 194 \mathrm{IP}$, and 883 BFP ) and compare them with those of the Indians' Jake Westbrook ( $116 \mathrm{Ks}, 2152 / 3 \mathrm{IP}$, 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 12 th 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 $=(3 x I P)+H+B B+H B P-G I D P$, where GIDP is estimated from GIDP $=\operatorname{IPx}$ (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: $\mathrm{BFP}=(3 \mathrm{xIP})+\mathrm{H}+\mathrm{BB}+\mathrm{HBP}-\mathrm{GIDP}$. 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:

## BIO NEEDED

| BA | Qty. | OBP | Qty. |
| :--- | :---: | :--- | ---: |
| $\geqslant .300$ | 13 | $\geqslant .400$ | 17 |
| $\geqslant .320$ | 0 | $\geqslant .450$ | 11 |
| $\geqslant .340$ | 2 | $\geqslant .500$ | 2 |
|  |  |  |  |
| SLG | Qty. | HR | Qty. |
| $\geqslant .500$ | 18 | $\geqslant 30$ | 19 |
| $\geqslant .600$ | 14 | $\geqslant 40$ | 13 |
| $\geqslant .700$ | 9 | $\geqslant 50$ | 3 |
|  |  |  |  |
| RBI | Qty. | R | Qty. |
| $\geqslant 100$ | 14 | $\geqslant 100$ | 10 |
| $\geqslant 120$ | 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 0 h 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, l'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: "l'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/analysisjalbright8.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:


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:

| G | COMPOSITE |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 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 | $\mathbf{G}$ | $\mathbf{A B}$ | $\mathbf{H}$ | $\mathbf{2 B}$ | $\mathbf{3 B}$ | $\mathbf{H R}$ | 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 |
|  |  |  |  |  |  |  |  |  |  |  |  |

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

[^2]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 goodlooking 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

|  | First <br> Played | Last Full <br> Schedule | Last <br> Scheduled |
| :--- | :---: | :---: | :---: |
| Holiday | 1882 | 1957 | 1981 |
| Memorial Day | 1881 | 1956 | 1984 |
| Independence Day | 1888 | 1958 | 1983 |
| Labor Day |  |  |  |

(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 singleadmission 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 ting 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．？

》 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 1950 s．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 l＇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．＂
？．Both holidays had brief twin bill scheduling revivals，Bunker Hill Day in 1955 and Patriots Day from 1963 to 196？．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.

# August 31, 1932: The Day of the Ineligible Player 

Well-seasoned SABR members will easily recall the days of perusing boxe scores in which-frequently rather than rarely-the lineups came to nine to a dozen players on each side. In nearly all instances, box scorekeeping was relatively easy. When now and then a box score addict encountered a batting order alteration caused by substitutions, a quick glance at the pinch-hitting notes, clarified how, when, and why this had occurred. ${ }^{1}$ For the aficionado, the symmetry, clarity, and certainty that he found in his daily ration of box scores provided a few moments of internal quiescence that seemed constantly to escape him in the otherwise unending turmoil of everyday living.

As an exception to this reassuring tableau, on August 31, 1932, the Chicago Cubs and New York Giants played a game at Wrigley Field that was extraordinary, ${ }^{2}$ ending in such a way as to cause two of the most influential newspapers, representing the cities of the rival teams-the Chicago Tribune and the New York Times-to print discrepant box scores.

In the game the Cubs gradually overcame a four-run deficit, tying it in the ninth and winning it in the tenth. In the tenth inning, a unique batting order entanglement arose that created the newspapers' box score asymmetry. The origins of this snarl began with two substitutions that Cub manager and first baseman Charlie Grimm made in the eighth inning. Having, as number six hitter, doubled, thereby narrowing the Giants lead to 5-4, he then withdrew for a pinch-runner (Stan Hack). The number seven hitter, Gabby Hartnett, though a power at the plate, was slow, so Grimm had Marv Gudat, reserve outfielder and first baseman, bat for him. ${ }^{3}$ After Gudat made out, he stayed in the game as Grimm's replacement at first base. Necessarily, he replaced Hartnett as the number seven hitter. Since there had to be another catcher, Zack Taylor replaced Hartnett, but equally unavoidably, as the number six, not number seven hitter. ${ }^{4}$

In the course of tying the game in the ninth, Frank Demaree, a reserve outfielder, pinch-hit for the relief pitcher, Bob Smith. This entailed no batting order repositioning, so the new Cub

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pitcher would continue to bat in the ninth spot for hurlers.
During the Cubs ninth, it began to rain steadily. The umpires would have been justified in declaring the game ended in a 5-5 tie. However, since this was the Giants' last game at Wrigley Field for the season, and it was important for the Cubs, they decided to allow it to continue. From then on, the steady rain had an important bearing on the outcome.

Grimm turned to Guy Bush, a starter, as his next relief pitcher. Unable to grip the wet ball properly, Bush gave up two hits, a walk, hit two batters, and made a wild pitch, while four Giant runs clattered in. Grimm had to replace him with his fifth pitcher, Leroy Herrmann, who had appeared in seven games that year and had a 6.39 ERA. Somehow Herrmann retired the side with no more runs scoring.

As the Cubs' half of the tenth inning started, the rain began to beat down harder. Bill Terry, also a playing manager-first baseman, put in Sam Gibson-like Herrmann, barely a major leaguer-as his new pitcher. Up came the Cubs' first hitter.

Several Cub players gathered around home plate umpire, George Magerkurth, to inform him that Bill Jurges, the injured regular shortstop, would pinch-hit for Leroy Herrmann. Grimm had gotten his number six and nine hitters mixed up. Since, according to the rule book, no manager on offense is permitted to replace a batter in a fixed batting position with a different player occupying another lineup spot, Jurges-whether Grimm or anybody else understood it or not-was pinch-hitting for Taylor, not Herrmann. It is not an umpire's duty to inform a team that it is about to permit one of its players to bat out of turn, so Magerkurth listened without comment to what the Cubs had to say. The field announcer informed the fans that Jurges would bat for Herrmann.

Jurges made out. Neither before his at-bat nor especially after did the Giants file a protest, since his out had served their purpose. This effectively eliminated Taylor from the game. Gudat, the number seven hitter, easily made out also. The Giants had a four-run lead, there were two outs, and nobody on. How could they possibly lose?

Mark Koenig, the Cubs fill-in shortstop, came up. He drove a home run high into the right field bleachers. This made the score 9-6. Among the players and such rain-drenched fans as remained, this ignited a spark of hope.

Then came the most baffling development of this-or almost any other game. Who batted but Zack Taylor! By rule in the catcher's number six spot, he turned up intending to bat ninth.

In the rule book for 1932, two provisions covered Taylor's situation. First, rule 44, section 1-the usual batting out-ofturn provision-specified that a claim to its application had to be made before the first pitch to the next batter. Second, rule 17, section 2-which almost never was needed-held that any player replaced by another could not return to the game. ${ }^{5}$ At this moment Magerkurth should have ordered Taylor back to the bench as no longer eligible to play. That he did not suggests that in the rain and confusion, he too had gotten tangled up.

Taylor singled to right. All that Terry had to do to win the game then and there was, before the next pitch, to remind Magerkurth either that as an illegal batter, Taylor could not possibly be in the correct batting position, or, if Magerkurth's omission had granted him a phantom batting status, then he was still batting out of order because the ninth spot belonged to Herrmann. Magerkurth then would have invoked the "out" penalty for a hitter batting out of turn, and the Giants would have won. In the moment while the great question hung in the rain, Taylor was a hitter who had not only batted out of turn, but was not even in the game, yet had delivered a vital hit.

Terry made no move. It is barely possible that, still enjoying a three-run lead with two out, he felt that it would come more easily through some routine play ${ }^{6}$ than to try, in the boggy bedlam, to get the umpire's attention long enough to explain that the Giants had won for as sane a reason as that the rule book said so. Much more likely, however, is that between keeping up with his field position on the field and the chaos on the field, he had become hopelessly entangled in Grimm's substitutions. After all, Grimm himself had. This episode graphically illustrated one reason why playing managers gradually became obsolete. In a sudden, in-game rules crisis a playing manager had too much to do to protect his team on rule book technicalities.

Gibson threw a pitch to the next batter, so Taylor's hit stood. Furthermore, this legitimatized him as a batter hitting in the proper spot. As the game continued, it quickly took an ominous turn for the Giants. The next two batters singled, scoring Taylor and making it 9-7. Up came Kiki Cuyler, the Cubs fine right fielder and years later Hall of Fame electee. He was a valuable clutch hitter. In this game he already had four hits. One was a triple that hit the scoreboard-then at ground level in deep center field-a deed accomplished only thrice before.? Another was the two-out single in the ninth inning that had tied the score. Moreover, earlier in the summer, in a last of the ninth tie with Gibson pitching, he had singled to win the game.

Gibson pitched to him this time with it raining harder than
ever, and almost unbelievably Cuyler slammed a home run into the bleachers just to the right of the scoreboard. It won the game for the Cubs, 10-9. Such fans as remained all but went berserk. Actually, given the conditions in which Cuyler hit this home run, it was a greater feat than Gabby Hartnett's more famous "homer in the gloaming," September 28, 1938.

From the team's standpoint, this was the climactic and final one of a twelve-game winning streak. So inspirational was the finish that it all but ensured that the Cubs would win the 1932 National League pennant. Of its kind, so a rare a feat was it that in more than 70 years since not once has the team won with a five-run rally in the last half of an extra-inning game.

To return to the Tribune's and the Times' disparate box synopses, suppose an ardent fan from each city had examined his newspaper's box score and game account. What would he have found? Since the Cubs' victory was a momentous one, the Windy City reader would have been able to pore over several columns devoted to the game, including an elaborate account of the tenth-inning fantasy. However, he would have had to end up shaking his head in disbelief at the Tribune's version of the box score. If, as it insisted in its game account, Jurges had batted for Taylor in the sixth position-where its box listed him as playing - then how could it account for the actual fact that the reserve catcher had batted ninth, without so indicating it? Furthermore, if, as the box conceded in its pinch-hitting footnotes, Jurges had batted for Herrmann, then how did this last pitcher turn up batting sixth, when the only ninth-inning change showed Demaree pinch-hitting for the pitcher, meaning that whoever was the final pitcher had to be batting ninth? There was no possible explanation of the discrepancies.

As for the Giants fan, he would at least have had before him what officially was the correct box score. However, he would have been at a loss to figure out how it possibly could be so. The Times account of the game was a lackluster one, so the fan would have obtained no enlightenment from that quarter. But the effect was to leave the fan mystified as to what occurred. This box score addict would have quickly spotted that the only Cub ninth-inning substitution was Demaree batting for the pitcher, meaning that any subsequent Cub pitcher was bound to bat ninth. Yet while Bush was listed in that spot, somehow Herrmann, his successor, appeared in the sixth spot. Furthermore, how could it be that catcher Taylor appeared as batting ninth, when his predecessor Hartnett, was shown as hitting seventh. ${ }^{8}$ Whether the box score fancier lived in Chicago or New York, he could only conclude in silent desperation that it was not even safe to assume infallibility in this one small corner of his life where he thought he had found it.

## NEW YORK TIMES BOX SCORE, SEPTEMBER 1, 1932

## Chicago tribune box score, september 1, 1932

| NEW YORK | AB | R | H |  |  | E | E | CHICAGO |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Joe Moore, If | 5 | 2 | 1 | 4 | 0 | 0 | 0 | Herman, 2b | 6 | 2 | 3 | 4 | 5 |
| Critz, 2b | 6 | 2 | 4 | 1 | 5 | 0 | 0 | English, 3b | 6 | 1 | 2 | 0 | 3 |
| Terry, 1b | 6 | 1 | 5 | 13 | 0 | 0 | 0 | Cuyler, rf | 6 | 2 | 5 | 2 | 1 |
| Ott, rf | 6 | 0 | 2 | 2 | 0 | 0 | 0 | Stephenson, If | 3 | 1 | 1 | ? |  |
| Lindstrom, cf | 5 | 0 | 1 | 2 | 0 | 0 | 0 | $J$. Moore, cf | 5 | 0 | 0 | 2 | 0 |
| Hogan, c | 5 | 0 | 0 | 3 | 1 | 0 | 0 | Grimm, 1b | 4 | 0 | 3 | 11 |  |
| Marshall, ss | 4 | 1 | 1 | 3 | 5 | 0 | 0 | cHack | 0 | 0 | 0 | 0 | 0 |
| Vergez, 3b | 4 | 2 | 2 | 1 | 3 | 0 | 0 | Hermann, p | 0 | 0 | 0 | 0 |  |
| Fitzsimmons, p | 2 | 0 | 0 | 0 | 2 | 0 | 0 | e-Jurges | 1 | 0 | 0 | 0 | 0 |
| Bell, p | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Hartnett, c | - | 0 | 0 | 1 | 0 |
| *0'Farrell | 0 | 1 | 0 | 0 | 0 | 0 | 0 | Gudat, 1b | 2 | 0 | 0 | 1 | 0 |
| Gibson, p | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Koenig, ss |  | 2 |  | 1 | 3 |
|  |  |  |  |  |  |  |  | Warneke, p | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  | Tinning, p | 1 | 0 | 0 | 0 | 2 |
|  |  |  |  |  |  |  |  | b-Hemsley | 1 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  | Smith, p | 1 | 0 | 1 | 0 | 3 |
|  |  |  |  |  |  |  |  | d-Demaree | 1 | 1 | 1 | 0 | 0 |
|  |  |  |  |  |  |  |  | Brush, p | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  | Taylor, c | 1 | 1 | 1 | 1 | 0 |
|  | 43 | 9 | 16 | *29 | 16 | 0 | 0 |  | 45 | 10 | 19 | 30 | 0 |
| *Two out when winning run was scored |  |  |  |  |  |  |  | a-Batted for Bell in the tenth <br> b-Batted for Tinning in the fourth <br> c-Ran for Grimm in the eighth <br> d-Batted for Smith in the ninth <br> e-Batted for Hermann in the tenth |  |  |  |  |  |
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| NEW YORKCHICAGO |  |  | 10 | 10 | 00 |  | 000 | $4-9$ |  |  |  |  |  |
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Runs batted in-Terry 3, Ott, Cuyler, 5, Stephenson, Hemsley, Grimm, Joe Moore, Critz 2, Koenig, English. Two base hits-Critiz, Stephenson, Grimm. Three base hits-Terry, Cuyler, Koenig. Home runs-Koenig, Cuyler. Sacrifices-Fitzsimmons 2. Double plays-Herman, Koenig and Grimm; Critz ,Marshall and Terry; Fitzsimmons, Marshall and Terry; Hogan, Marshall and Terry; Stephenson, Koenig and Taylor. Left on base-New York 10; Chicago 9. Bases on balls-Off Warneke 1; Fitzsimmons 2, Bell, 1, Bush 1. Struck out-by Fitzsimmons 3; Smith 1. Hits-Off Warneke, 4 in 0 innings (pitched to five men), Fitzsimmons 14 in $81-3$, Tinning, 4 in 4 ; Bell, 0 in 2-3; Smith, 5 in 5, Gibson, 5 in 2-3; Bush, 2 in 0 (pitched to five men), Hermnann 1 in 1 . Hit by pitcher-By Bush (Vergez, O'Farrell). Wild pitches-Fitzsimmons, Bush. Winning pitcherHerrmann. Losing pitcher-Gibson. Umpires-Magerkurth and Quigley. Time 2:15.


Runs batted in-Terry, [3], Ott, Cuyler, [5], Stephenson, Hemsley, Grimm, Joe Moore, Critz [2], Koenig, E. English. Two base hits-Critiz, Stephenson, Grimm. Three base hits-Terry, Cuyler, Koenig. Home runs-Koenig, Cuyler. Sacrifices-Fitzsimmons [2]. Double plays-Herman to Keonig to Grimm; Critz to Marshall to Terry; Fitzsimmons to Marshall to Terry; Hogan to Marshall to Terry; Stephenson to Koenig to Taylor. Left on bases-New York 10; Chicago 9. Bases on balls-off Warneke, 1; Fitsimmons, 2; Bell, 1, Bush, 1. Struck out-Fitzsimmons, 3; Smith, 1. Hits-Off Warneke, 4 in no innings [pitched to five men] Fitzsimmons, 14 in 8 1-3; Tinning, 4 in 4 ; Bell, none in $2-3$; Smith, 5 in 5; Gibson, 5 in 2-3; Bush, 2 in none [pitched to five men]: Hermann 1 in 1 . Hit by pitcher-By Bush [Vergez, $0^{\prime}$ Farrell]. Wild pitches-Fitzsimmons, Bush. Winning pitcher-Herrmann. Losing Pitcher-Gibson. Umpires-Magerkurth and Quigley. Time-2:15.

## Notes

1. Soon after the end of World War II, the emergence and development of the defensive double switch put an end to easily figuring out how a change in the batting order had come to be.
2. The Chicago Tribune noted the managers' and umpires' mistakes on September 1, 1932, in an article entitled: "Taylor Bats Out of Turn; Giants Umpires Miss It." As if an omen, players and spectators alike were left agog by a full solar eclipse that occurred immediately prior to the game.
3. In the third inning, a heavy shower had halted play for half an hour, making the infield soft, leading Grimm to feel that if Hartnett hit anything on the ground, he would be a sure out, while Gudat, who was quite fast, might beat out a slowly hit ball.
4. This and subsequent references to game happenings are drawn from the Chicago Tribune, September 1, 1932, from the Chicago Daily News' "My Biggest Baseball Day" Series, 1940s by John P. Carmichael, which included Charley Grimm's "Greatest Day," as recounted to Hal Totten, and, slightly, from the New York Times, September 1, 1932.
5. The two rules from the 1932 rulebook are quoted in the Chicago Tribune, September 1, 1932. The author, who listened to the game on the radio as a 12-year-old, recalls that the broadcasters mentioned the batting out of order, but missed the other rule violation
6. This, at least, was what Grimm thought the Giants manager might have had in mind-"Grimm's Biggest Baseball Day," p.15.
7. Previously only Rogers Hornsby, while he was with the St. Louis Cardinals, and Hack Wilson had smashed drives far enough to hit the scoreboard on the fly. A month after Cuyler's hit, Babe Ruth, with his most famous home run, cleared the scoreboard for the only time.
8. Until recent decades it was the scoring custom, when a pinch-hitter stayed in the game, not to list him in the pinch-hitting notes. Ordinarily this made no difference except to leave a certain number of players' pinch-hitting statistics in the record books as fewer than they actually were. However, in a very rare case such as this one wherein Gudat pinch-hit, followed by then staying in the game, produced a lineup alteration, the failure to identify him as a pinch-hitter meant that the Times box score left the problem of how the batting order switch had occurred entirely unexplained.

## TRENT McCOTTER

## 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 ( $\mathrm{H} / \mathrm{AB}$ ) 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 $1+\mathrm{H}, 2+\mathrm{H}, 3+\mathrm{H}$, 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 $A B$ 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.

## BIO NEEDED

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

$$
\frac{x-\mu}{\sigma}
$$

where x is the statistic of the individual player whose z score is being calculated, $\mu$ is the mean for the entire league, and $\sigma$ 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 $200+A B$ 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

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 $\geqslant .400(\%)^{*}$ |
| :--- | ---: | :--- | :--- | :--- | :--- | :--- | :--- | ---: |
| 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 | $49(35.8 \%)$ |
| F |  |  |  |  |  |  |  |  |

*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 $\mathbf{. 4 0 0 0}$ |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
| 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 $\mathbf{. 4 0 0 0}$ |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| 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 | -1 AB (.4006) |
| Lefty O' Doul | 1929 | PHI | NL | 638 | 254 | .3981 | $+1 H,-1 A B(.4003)$ |
| H. Heilmann | 1927 | DET | AL | 505 | 201 | .3980 | $+1 H(.4000)$ |
| R. Hornsby | 1921 | STL | NL | 592 | 235 | .3970 | $+2 \mathrm{H}(.4003)$ |
| Ed Delahanty | 1896 | PHI | NL | 499 | 198 | .3968 | $+2 H(.4008)$ |
| Jesse Burkett | 1899 | STL | NL | 558 | 221 | .3961 | $+2 H,-1 A B(.4004)$ |
| Joe Jackson | 1912 | CLE | AL | 572 | 226 | .3951 | $+3 H(.4003)$ |

Players 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） |  |  |  |  |  |  | Highest Batting Average（Away） |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4794 | O＇Neill | STL | AA | 1887 | （128－267） | ． 4429 | Turner | PHI | NL | 1894 | （62－140） |
| .4776 | Hornsby | STL | NL | 1925 | （117－245） | ． 4325 | Lajoie | PHI | AL | 1901 | （125－289） |
| ． 4732 | Sisler | STL | AL | 1920 | （150－317） |  |  |  |  |  |  |


| 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） |  |  |  |  |  |  | Most Hits（Away） |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 150 | Sisler | STL | AL | 1920 | （78 | games） | 131 | Sisler | STL | AL | 1922 | （77 | games） |
| 143 | Delahanty | PHI | NL | 1899 | （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．

| Oct. (H-AB) |
| :---: |
| -- |
| . 4634 (19-41) |
|  |
|  |
|  |
| -- |
| . 3000 (3-10) |
| . 3333 (1-3) |
| -- |
|  |
| . 3256 (14-43) |
| . 4474 (17-38) |
| -- |
| . 5000 (4-8) |
| . 4615 (6-13) |
| . 5000 (7-14) |
| -- |
| $.4000(12-30)$ |
|  |  |
|  |
| -- |
| -- |
| -- |
| . 6667 (4-6) |
| . 6000 (3-5) |
| -- |
| -- |
| 1.000 (1-1) |









풀


















## Z－Scores，probabilities，and 2004 equivalents

| Player | Year | Team | Lg | AB | H | AVG | G | z－Score ${ }^{\text {a }}$ | Prob．${ }^{\text {b }}$ | 2004 Eq．${ }^{\text {c }}$ | 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． <br> $\mathrm{a}_{\mathrm{z}}=$ Standard Deviations from mean（omit－ ting the stats of the player evaluated，and any player with＜200 AB in a season in both mean and $S$ to avoid giving low $A B$ seasons too much influence and to allow the batting averages to better reflect the general batting of the league season） <br> ${ }^{\text {b }}$ Probability of that average with at least 200 $A B$ in that league season based on $z$－score． ［1／（Area to the right on the normal density curve for $Z$ deviations above mean）］ <br> ${ }^{\text {C }}$ The batter＇s 2004 equivalent of batting average using（player＇s $z$＊stdeviation of 2004 batting）＋（mean batting average for all players with $200+\mathrm{AB}$ in 2004）． |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 | ． $3582 \dagger$ |  |
| 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 |  |

## 10 highest averages since 1941

| Player | Year | Team | Lg | AB | H | AVG | G | z－Score $^{\text {a }}$ | Prob．$^{\text {b }}$ | 2004 Eq．${ }^{\text {c }}$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 $^{\text {a }}$ | Prob．$^{\text {b }}$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2004 Eq． |  |  |  |  |  |  |  |  |  |  |

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 re－ sulted 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 Jackso | 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 | 95 | 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 0 '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\%).
increasingly difficult.
Hopefully, these splits will provide some insight into how these great seasons were compiled, so enjoy!

## 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. ICl 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:

```
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
```

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, 1894

Sam Thompson, 1894; Ed Delahanty, 1894; Billy Hamilton, 1894; 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 Encylopedia (2004):

## Acknowledgments

Putting together all of these wonderful splits on some of the best seasons in baseball history required a great deal of aid from fellow researchers and friends. I would like to thank Bill Deane, Steve Gietschier, Pete Palmer, Brian Rash, and Bob Tiemann for helping me throughout this process; it simply would not have been feasible without their help.

# 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

## BIO NEEDED

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 emergency 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 bases 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 Devil Rays 4-1 in the top of the ninth inning, and three September call-ups are due up for Tampa Bay.

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 nearautomatic 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 the seventh and eighth innings than in the ninth. 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 disas－ ters 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 com－ plicated 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 analo－ gous 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．
＊ $\mathrm{OR}^{*}$
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 follow－ ing 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 pinch-hitters 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."


Rank Pitcher

| Rank | Pitcher | Tm | w | L | SL | BL | SG | BG | SG | BG | Pts | RIds. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 | 85 |
| 3 | 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 | 11 |
| 5 | 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 | ? | $?$ | 27 | 5 | 0 | 0 | 27 | 5 | 86 | -8 |
| 12 | Rincon, Juan | MIN | 11 | 6 | 25 | ? | 0 | 0 | 25 | 7 | 78 | 8 |
| 13 | Linebrink, Scott | SD | 7 | 3 | 24 | ? | 0 | 0 | 24 | 7 | 76 | -2 |
| 14 | Otsuka, Akinori | SD | 7 | 2 | 22 | 7 | 1 | 0 | 23 | ? | 75 | 6 |
| 15 | 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 | 3 |
| 23 | 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 | 8 |
| 35 | 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 | 7 |
| 38 | 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 | 4 |
| 43 | 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 | $?$ | 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 | 9 |
| 50 | 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 | 8 |
| 54 | 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 | 7 |
| 59 | Francisco, Frank | TEX | 5 | 1 | 11 | 2 | 0 | 0 | 11 | 2 | 41 | 2 |
| 59 | Mahay, Ron | TEX | 3 | 0 | 11 | 2 | 0 | 0 | 11 | 2 | 41 | 2 |
| 62 | 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 | 8 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 65 | 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 | 8 |
| 69 | 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 | 2 |
| 75 | 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 | 4 |
| 84 | 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 | 6 |
| 90 | Howry, Bob | CLE | 4 | 2 | 10 | 4 | 0 | 1 | 10 | 5 | 24 | 0 |
| 90 | 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 | ? | 23 | 88 |
| 93 | Cruz, Juan | ATL | 6 | 2 | 6 | 1 | 0 | 0 | 6 | 1 | 23 | 8 |
| 93 | 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 | 2 |
| 97 | Sosa, Jorge | TB | 2 | 3 | 5 | 0 | 1 | 0 | 6 | 0 | 21 | 2 |
| 97 | 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 | $?$ |
| 112 | Leskanic, Curtis | BOS | 3 | 5 | 7 | 3 | 2 | 1 | 9 | 4 | 18 | 1 |
| 112 | Wagner, Ryan | CIN | 3 | 2 | ? | 3 | 0 | 0 | 7 | 3 | 18 | -4 |
| 112 | Bottalico, Ricky | NYM | 3 | 2 | 10 | 7 | 0 | 0 | 10 | ? | 18 | -6 |
| 119 | Putz, J.J. | SEA | 0 | 3 | ? | 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 |  | 15 | -2 |


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



| CWS | 2 | 3 | 2 | 3 | 0 | 1 | 2 | 4 | -9 | -2 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| TB | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 1 | -9 | -8 |
| LA | 1 | 2 | 3 | 5 | 0 | 1 | 3 | 6 | -10 | -6 |
| ANA | 0 | 2 | 1 | 1 | 0 | 2 | 1 | 3 | -11 | -6 |
| PIT | 0 | 3 | 2 | 3 | 0 | 1 | 2 | 4 | -11 | -8 |
| ARZ | 0 | 3 | 0 | 4 | 2 | 1 | 2 | 5 | -12 | 1 |
| MTL | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 2 | -13 | -6 |
| 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, $12 \mathrm{SL}, 5 \mathrm{BL}$, 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 $5 ?$ 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 3. Save Opportunity Analysis for the Top Six Closers of 2004.

## OTHER FINDINGS

Table 4. 2004 Inning-by-Inning Breakdown
Table 5. Team Rolaids Leaders That Did Not Lead Their Own Teams in the Rankings

## MR. OCTOBER

Table 6. All-Time Postseason Relief Rankings
Table 7. All-Time Team-by-Team Post-season Relief Rankings

## 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, 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.

## 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-toooften 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).

## BIO NEEDED

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 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 |
| :--- | :---: | :---: | :---: | :---: |
| At lanta | 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
Position players 10 yr
Position players 15 yr
Position players 20 yr
Position players Total
Pitchers 10 yr
Pitchers 15 yr
Pitchers 20 yr
Pitchers Total
Win Shares
67
177
312
556

68
127
248
44

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 alltime 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 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 winshare 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.

Table 1. Players Active at Various Ages in Each Group

| Position Players |  |  |  |  | Pitchers |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Age | $\mathbf{1 0 y r}$ | $\mathbf{1 5 y r}$ | $\mathbf{2 0 y r}$ | $\mathbf{1 0 y r}$ | $\mathbf{1 5 y r}$ | $\mathbf{2 0 y r}$ |  |
| 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 | -- | -- | -- | -- |  |

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).
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.

## 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.

Figure Legends
Figure 1. A schematic diagram showing how careers of various lengths limit the accumulation of win shares. The smooth curve is a parabola. See text for explanation.
Figure 2. Win shares plotted as a function of players' seasons of play, in which case they form stable groups that include players various ages. This is defined as Method 1 in the text. Data for 10- and 15-year position players and pitchers are fit

# 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.

## BIO NEEDED

## 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 19731990, 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

Figure 1. HBP (Average per team)


Figure 2. AL AvgHBP minus NL AvgHBP

years, followed by a downward trend through the mid-1980s, culminating in a sharp upward trend over the last 17 seasons.

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 AvgHBPNL 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 row 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 row 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 <br> vs. Post-DH | 30 Pre-DH <br> 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 left 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

< 0.001

72 Pre-DH
0.110

30 Pre-DH
0.359

Post-DH
< 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 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 new 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 (bottom row). In fact, the NL AvgHBP is higher than the AL AvgHBP by 0.01 .

Table 4

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

Table 5 shows the same statistical tests as Table 2, but now with the "true hitters" data. The left half of Table 5 is identical to the left 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

## FPO

[Still having problems)

## Table 5

|  | AL | NL | Total | Adj. | Adj. |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
|  | HBP | HBP | HBP | AL AVG | NL AVG | Diff. |
| 72 Pre DH |  |  |  |  |  |  |
| v. Post DH | $<.001$ | $<.001$ | $<.001$ | .672 | .422 | .300 |
| 30 Pre DH |  |  |  |  |  |  |
| v. Post DH | $<.001$ | $<.001$ | $<.001$ | .076 | .063 | .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 | $\mathbf{7 2}$ Pre DH | $\mathbf{3 0}$ 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 increas-
ing 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

The data clearly show that AL batters are hit by pitches more often than their NL counterparts, when averaged across teams (Figures 1-2; Tables 1-3). Prior to the implementation of the DH rule in 1973, there was no significant difference in the number of HBPs between the two leagues. After 1973, there was a significant difference, as expected. In the Post DH era, the AL had an average of $12.2 \%$ more HBPs than the NL. This number is in line with Goff et al.'s (1997) " $10 \%$ to $15 \%$ increase" discussed earlier.

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## The Worst Team Ever?

A$t$ 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. 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. ${ }^{11}$

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.

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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 <br> Diff. | League <br> Runs per <br> Game | Adj. <br> Factor | Adj. <br> Loss |
| :--- | :---: | :---: | :---: | :---: |
| Diff. |  |  |  |  |

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 |
| 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.

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## Lawrence S. Ritter, the Last New York Giant

n 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, l'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, frustrated and disappointed, I took some wash to the lo-

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cal 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 l'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 gamblercards 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 get-
ting 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. ${ }^{1} \mathrm{He}$ 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).

# 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 wellknown 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-

## bIOS NEEDED

ducted by the social psychologist Roy Baumeister ${ }^{2}$ supported the idea that situations that cause people to be extremely selfconscious 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 selfconsciousness, 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
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 AllStars 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-Starlike." That is, the goal was to see if their hitting is particularly poor in the context of baseline levels of performance in the AllStar 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 chisquare 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, $.225 \mathrm{vs} . .223$, 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 AllStar 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, 632643.
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, AI 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 sec-ond-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,

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#### Abstract

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 deci-sions-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 $61 / 2$-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

|  |  | Rotation Alternative <br> Var. |  |  |
| :---: | :--- | :---: | :---: | :---: |
| (a) | (bl) | (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 | $54 \%$ | $46 \%$ | $49 \%$ |

[^3]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 midAugust, 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 lefthanded 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.? 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 proBaylor 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 tworun 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, all of which will strengthen the game.

## 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 complementand, 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

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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: $1.049 \mathrm{BA}, 1.053$ OBP, and 1.05 ? 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 lefthanded 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 ${ }^{\mathbf{2}}$ |
| :--- | :--- | ---: |
| 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:

| 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 $641 / 2$ 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 200game 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 40 s.

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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


Greg Maddux
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 $60^{\prime} 6^{\prime \prime}$ ). 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
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, lowscoring 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 nineyear 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

0ne 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 1970 s and all of them are before the 1980 s, 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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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 |  |
| $\qquad$ |  |  |  |
| * 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 allaround 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+ |  | 20+ |
|  |  |  |  |  |  |  | HR | HR | 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.

|  |  |  | Teammates with |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Player |  |  | 40+ | $\mathbf{3 0 +}$ | $\mathbf{2 0 +}$ | $\mathbf{1 0 +}$ | $\mathbf{9 0 +}$ |
| 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 |


| 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.

|  |  |  |  |  | MOST | MOST MOST |  |
| :--- | :---: | :---: | :--- | :--- | :---: | :---: | :---: |
| Pitcher | SV | W | G | GS | GS | W | 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 |

# 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?

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(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 $12 / 3$ 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 sevengame 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-handedhitting Rice facing such Cincy left handers as Don Gullet, 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 Dennis Eckersley in 1992). Although the Brewers were eliminated by the Yankees in a close fivegame 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, l'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-anhour 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 ' 80 s 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 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, AI 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?

Ano-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 $P(0)$. Mathematically, we would say: $P(0)=O A /[O A+H]$.

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 $\mathrm{P}(0) \times \mathrm{P}(0) \times \mathrm{P}(0) \ldots \times \mathrm{P}(0)$ (27 times). Mathematically, $P(N H)=P(0)$ ffi 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 nohitter. 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

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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 | 2 |
| Jay Parker (1899 Pirates) | 0 | 0 |
| Frank DuPee (Chicago WS - 1901) | 0 | 0 |
| Charlie Fritz (1907 A's) | $2^{2 / 3}$ | 0 |
| Pat McGehee (1912 Tigers) | 0 | 1 |
| Jim Scoggins (Chicago WS - 1913) | 0 | 0 |
| Dan "Babe" Sherman (1914 Whales) | $1 / 3$ | 0 |
| Clay Roe (Washington - 1923) | $12 / 3$ | 0 |
| Joe Brown (Chicago WS - 1927) | 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 $92 / 3$ innings. With 29 outs achieved and only one hit allowed his $P(0)=0.9667$ and his $P(N H)=0.4004$, or about 1 in 2.50 . Since Hennis's career of $92 / 3 \mathrm{IP}$ 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 | $\mathbf{O + H}$ | $\mathbf{P ( 0 )}$ | P(NH) |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | "1 in"

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(0) | $\mathbf{P}$ (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.

The $P(N H)$ 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 $P(N H)$ 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 $\mathrm{P}(\mathrm{NH})$. 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: $1-P(N H)$, or $P^{\prime}(N H)$. So, the probability of a pitcher not throwing any no-hitters in " $x$ " consecutive games is $P^{\prime}(N H) x P^{\prime}(N H) x \ldots x P^{\prime}(N H)$ ("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 $P^{\prime}(N H)=1-P(N H)$ 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 nohitter is his career is: P (at least one career NH$)=1-\left(\mathrm{P}^{\prime}(\mathrm{NH})\right.$ ffi GS).

Table 4. Pitchers most likely to have at least one 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 nohitters. 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 this top- 25 list because of his comparatively low number of 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 no-hitter

| 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 | 0.001618 | $30.42 \%$ |

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 nohitters, who overcame the greatest odds to do so? Table 6 lists the 25 most unlikely pitchers since 1900 to have thrown nohitters based on the probability of throwing at least one nohitter in their career number of starts:

Table 6. Pitchers to have thrown a no-hitter based on career probability of at least one

| 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 oneyear 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 nohitter? 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. $\mathbf{5 0}$ career starts)

| Name | IP | G | GS | CG | H | O+H | $\mathbf{P}(0)$ | 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 most unlikely to throw a no-hitter in a single start (min. 50 career starts)

| Name | IP | G | GS | $\mathbf{C G}$ | $\mathbf{H}$ | $\mathbf{O + H}$ | $\mathbf{P ( 0 )}$ | $\mathbf{P ( N H )}$ | " $\mathbf{1} \mathbf{i n "}$ |
| :--- | ---: | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 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 nohitters, 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 $-P(N H)$ - and the probability of not throwing a no-hitter - $\mathrm{P}^{\prime}(\mathrm{NH})$ - 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: $\left[\mathrm{P}(\text { success })^{\mathrm{n}} * \mathrm{P}(\right.$ failure $\left.)(\mathrm{x}-\mathrm{n}) * \mathrm{C}(\mathrm{x}, \mathrm{n})\right]$, where $\mathrm{C}(\mathrm{x}, \mathrm{n})$ 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:
$P($ " $n$ " no-hitters in "x" starts $]=\left[P(N H)^{n} * P^{\prime}(N H)^{(x-n)} *\right.$ ( $x!] /[(n!)(x-n!)]$

In Nolan Ryan's case, $\mathrm{P}(\mathrm{NH})=0.0028266, \mathrm{P}^{\prime}(\mathrm{NH})=$ 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 $\mathbf{7 7 3}$ 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.

## Acknowledgments

Special thanks to SABR member Pete Hepopski for helping refine my original formulas into the simpler, more complete versions used above following a regional meeting in Minneapolis. Sean Lahman's database (available at www.baseball1.com) provided all the statistical data.

## 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.

## THE NATIONAL PASTIME №24

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 AI 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.

## BASEBALL RESEARCH JOURNAL №32

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 $1 / 2$ 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 $491 / 2$ 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 $31 / 2$ 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.


[^0]:    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.

[^1]:    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.

[^2]:    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.

[^3]:    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.

