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Business + Editorial Office: Box 171, Winchester, Ks 66097. Bill James, Editor

Hi. We still owe you the six pages from last edition. Enough material came in for this edition to make (love that pseudo-professional jargon,) but just barely. I continue to receive all kinds of letters full of technical analysis of baseball, and continue to respond by imploring people to make this into an Analyst article so that more people will see it, but apparently I over-estimate my own persuasiveness, because that seems to be where the conversation ends.

Anyway, we've got three articles for you here--Dick O'Brien on Strikeout/Runs Driven In Ratios (page 2), Timothy Morway on Vince Coleman as a leadoff man (page 6), and Charles Pavitt with a further development on the concept of analyzing baseball as a Markov Chain without getting caught by the CIA. That's kind of a long article, starts on Page 8 and finishes up, but it's an intelligent piece on a hot topic in sabermetrics, so we're glad to have it despite the length.

My plea for help with the study of minor league games played (see the last edition) brought generous assistance from Mark Endoh and Jerry Lansche. The help is much appreciated, and they will not be forgotten the next time I get in over my head on something. We've now reduced the number of players for whom I need minor league games played to nine: Jimmy Pofahl, Al Brancato, Al Rubeling, Jim Gleeson, Max West, Chet Ross, Art Mahan, Ham Schulte, and Bennie Warren. In all cases, the data I need is the number of minor league games played up to and including the 1940 season. Thanks, and especially to Mark and Jerry.

Bill James

CLOUDLAND REVISITED
By Dick O'Brien
(With an Assist and Putdown from Professor Cuthbert Magnolia)

Some weeks ago I received a phone call from Professor Cuthbert Magnolia of the Southwest Correctional Institute deploring my assay into Strikeout/Home Run ratios in the eighth issue of the Baseball Analyst. He would be driving through town the following week and challenged me to meet him at one of our better known pubs to discuss his grievances. I'd never met the man before, read him twice and spoken to him just this once. He talked like he wrote--bad grammar, convoluted syntax, rampant malapropisms, occasional amphibolies, monumental wrath.

Every so often the mind's eye conjures up a picture of the person one meets for the first time. With Professor Magnolia, the impression was etched in stone; a dessicated and acerbic but harmless old frump--someone like Gabby Hayes, perhaps. So you can imagine my surprise when he turns out to be a dead-ringer for the late great actor, the suave and urbane Louis Calhern.

Once we're settled in, he plunks down a doubloon of uncertain vintage and measures me like a wolf eyeing a lamb.

"You're a football fan, kiddo?"

"Not really. . .strictly hockey in the baseball off-season."

"What are you, anyway," he scowls, "some kind of effete intellectual snob? Or are you a nimp?"

"What in hell's a nimp, Bert?"

"That's a combination of a nerd and a wimp," he snorts.

He seems to savor my discomfort, then relents.

"You been readin' Eli's Stat Book?"

"No. Who publishes it? Yale University?"

"No, no, no. Some feller named Seymour Sidewinder or something like that. You really ain't up on things, are you, bub?"

"Oh. You mean ELIAS."

"Yeah, yeah. That's the dude. But you sure do talk funny."

To make short shrift of his further insults, the gist of his fulmination was that strikeout to home run ratios are a waste of time to pursue. They're only good for assessing sluggers. A more meaningful study would be to look at strikeouts per at bat as correlated with Runners Driven In per Runner in Scoring Position, the latter stats now available in Elias. It didn't take long to realize he was quite right. With some temerity I suggested he work it up and submit it for this publication. (It should be stated that when someone else is buying the drinks, I can be obsequious as hell.) He demurred by saying that his abacas was down and had to be sent to the factory in Possum Trot, Arkansas, for re-calibration or whatever it is that they do with neolithic artifacts. His parting shot was to tell me to stop living in cloudland--shake out the cobwebs and get down to serious, clear-headed thinking before taking pen in hand. While he was in the john, I poured salt into his flagon of mead. If I couldn't sweeten his disposition, I could at least sour his drink.

I haven't heard from him since.

Let's start by stating that the average big leaguer strikes out in 16% of his at bats, and drives in 28% of the runners that he finds in scoring position. Before Elias published figures of runs driven in from scoring position in 1984 and 1985 (pages 382 and 367, respectively, in the 1985 and 1986 editions), one could only compare strikeouts per at bat with RBI per at bat--figures that would be misleading and obviously favor one's slot in the batting order. Clearly, one can drive in runs for different reasons; what was needed was a stat that showed productivity in a specific situation without regard to base hits or RBI with a runner on first or the bases empty. Now we have it.

Using the 16% SO and 28% RDI as a benchmark for measuring productivity, we find that 67% of batters who struck out in 16% of their at bats or less drove in 28% or more of their runners in scoring position, thus were average or above in terms of producing runners. Of those who struck out in 17% of their at bats or more, only 45% were at or above the 28% norm. Looking at the leagues during the past two seasons, we come up with the following finds based on a minimum of 200 at bats for inclusion:

Strikeout Percentage (SO/AB)	No. of batters 28% or better (RDI/RSP)	Batter % Meeting Norm
.05	9 of 9	100%
.06	10 of 13	77%
.07	10 of 18	56%
.08	16 of 24	67%
.09	15 of 24	62%
.10	24 of 37	65%
.11	22 of 31	71%
.12	22 of 36	61%
.13	22 of 28	79%
.14	37 of 51	73%
.15	22 of 39	56%
.16	29 of 45	64%
.17	16 of 34	47%
.18	9 of 24	38%
.19	17 of 37	46%
.20	11 of 23	48%
.21	10 of 23	43%
.22	4 of 9	44%

Strikeout percentages below 5% and above 22% were not used because the groups were tiny. Of those listed, 238 of 355 players who were average or good in terms of strikeout frequency were also average of better in their ability to deliver runners from scoring position. Of those who struck out in 17% of their AB or more, only 45% met the .28 norm for delivering runners.

Not every free swinger leaves the runners on the bases. It's still an individual trait. On the one hand there is Dave Kingman, who despite striking out in 19% of his at bats (in 1985) still drove in 30% of his runners in scoring position (1984 data was 22% SO and 34% RDI.) But then there's Dwayne Murphy, who strikes out over 20% of the time and drives in less than a fourth of the runners in scoring position for him. The chart which follows looks at some of the game's free swingers.

FREE SWINGERS

	WINNERS			LOSERS		
	Player	SO%	RDI%	Player	SO%	RDI%
AL - 1984	Armas	.24	.32	Reggie Jackson	.27	.27
	Barfield	.25	.30	Kittle	.29	.19
	Balboni	.32	.32	Laudner	.30	.20
	Joe Carter	.20	.30	Lowenstein	.20	.16
	Wayne Gross	.20	.31	Dwayne Murphy	.20	.25
	Ruppert Jones	.22	.37	Lance Parrish	.21	.21
	Kingman	.22	.34	Pettis	.29	.25
	Moseby	.21	.34	Rayford	.20	.27
	Pagliarulo	.23	.35	Schofield	.20	.18
	Presley	.25	.32			
AL - 1985	Barfield	.27	.31	Armas	.23	.26
	Dempsey	.24	.32	Balboni	.28	.21
	Gibson	.24	.34	Easler	.23	.25
	Dave Henderson	.21	.29	Wayne Gross	.22	.12
	Reggie Jackson	.30	.31	Ruppert Jones	.21	.26
	Kittle	.24	.32	McDowell	.21	.21
	Shelby	.21	.33	Dwayne Murphy	.24	.23
				Gorman Thomas	.26	.24
				Tettleton	.28	.18
				Willard	.20	.27
				Meacham	.21	.26
				Larry Parrish	.22	.25
				Pettis	.28	.25
NL - 1984	Cey	.21	.36	Bailey	.21	.19
	Clark	.21	.37	Frobel	.30	.16
	Esasky	.32	.31	Gardenhire	.21	.18
	Fitzgerald	.20	.31	Komminsk	.26	.23
	Foster	.22	.31	Lemaster	.22	.24
	Green	.23	.30	Matuzak	.21	.27
	Guerrero	.20	.36	Samuel	.24	.24
	Mathews	.20	.34	Stubbs	.29	.13
	Schmidt	.22	.33	Virgil	.20	.27
	Strawberry	.25	.33			
	Van Slyke	.20	.34			
NL - 1985	Bailey	.21	.31	Cey	.21	.23
	Clark	.20	.33	Duncan	.20	.22
	Esasky	.25	.30	Green	.20	.21
	Marshall	.26	.32	HoJo	.20	.26
	Dale Murphy	.23	.34	Kemp	.23	.23
	Schmidt	.21	.30	Komminsk	.24	.24
	Strawberry	.24	.37	Leonard	.21	.25
	Thon	.20	.32	Mathews	.21	.27
				John Russell	.33	.18
				Samuel	.21	.27
				Virgil	.20	.23
				Winningham	.23	.21

INTERESTING COMPARISONS - 1985

Player	RSP	RDI%	SO%	HR	RBI% of AB
Herr	232	.41	.09	8	.18
Moreland	238	.35	.10	14	.18
Mattingly	215	.40	.06	35	.22
Glenn Wilson	217	.34	.19	14	.17
Baines	207	.36	.14	22	.18
Parker	206	.37	.13	34	.20
Hernandez	203	.36	.10	10	.15
Rice	209	.33	.14	27	.19
Brunansky	183	.26	.15	27	.16
O'Brien	182	.32	.09	22	.16
Baylor	179	.33	.11	23	.19
Von Hayes	177	.28	.17	13	.12
Gary Carter	176	.31	.08	32	.18
Kingman	175	.30	.19	30	.15
Gorman Thomas	177	.24	.26	26	.18
De Cinces	155	.30	.17	20	.18
Fisk	156	.33	.15	37	.20
Cowens	151	.32	.12	14	.15
Leonard	153	.25	.21	17	.12
Lance Parrish	189	.29	.16	28	.18
George Bell	187	.29	.15	28	.16
Nettles	145	.30	.13	15	.14
Moseby	146	.29	.16	18	.12
Horner	149	.32	.12	27	.18
Van Slyke	146	.28	.13	13	.13
Tabler	123	.41	.14	5	.15
Lynn	123	.28	.12	23	.15
Strawberry	111	.37	.24	29	.20
Bochte	113	.32	.14	14	.14
Ruppert Jones	117	.26	.21	21	.18
Cliff Johnson	114	.39	.16	13	.17

This listing is illustrative of the 3-4-5 hitters in the batting order.

One hates to be accused and convicted of embracing a false goddess too quickly, but this SO - RDI percentage matchup appears to me at this time to be the best measurement available in evaluating strikeout effects on productivity. After spending even more time in search of this elixir than I did in almost three decades of tireless treks through the Burmese jungles in search of the fabled saber-toothed pink krait, it looks as though we now have at least one treasure in hand.

BATTING LEADOFF FOR ST. LOUIS: GEORGE FOSTER

--Timothy Morway

Much was made of the impact of Vinnie Coleman and the success of the 1985 St. Louis Cardinals. Many remarked that Coleman was the catalyst of the Cardinals and he was the best leadoff hitter in baseball. I, for one, do not believe that for one moment.

I have researched several players whose batting averages were similar to Coleman's and I have tried to represent them in the context of the Cardinal offense. What I am trying to show is that there is more to leading off than getting on base 32% of the time and stealing 100 bases (especially if your slugging percentage is .335).

First I dealt with runs scored. I pro-rated the following players whose batting averages were similar to Coleman's .267: Jorge Orta, KC, .267; Al Cowens, SEA, .265; Chet Lemon, DET, .265; Tony Armas, BOS, .265; Dwight Evans, BOS, .263; Steve Lyons, BOS, .264; George Foster, NY, .263; Jeff Stone, PHI, .265; Ken Landreaux, LA, .268; Terry Harper, ATL, .264. Notice that these are all outfielders except Orta who is a DH. What I pro-rated was the outfielders' plate appearances to Coleman's plate appearances. I got the number of times they would have reached base given the same number of opportunities as Coleman. Then using the pro-rated plate appearance, I also pro-rated doubles, triples, stolen bases, walks, etc. This was all calculated together in a way to give me BASES GOTTEN. (BASES GOTTEN: total bases + walks + stolen bases + times hit by pitcher minus times caught stealing - times grounded into a double play). The reason I included times grounded into a double play is because I did not think it was fair to Coleman not to give him some kind of credit for not getting doubled up as many times as he did. Since I am trying to find out the number of times each player was driven in by his teammates, I then had to take away the number of times each player drove in himself with a home run. Thus I took away four total bases from each player for each home run. This is the BASES GOTTEN number. I then calculated the number of times Coleman was driven in by his teammates per at bat which was runs scored divided by BASES GOTTEN. This number for Coleman was .311.

I took this number (.311) and applied it to the BASES GOTTEN figure for the players listed earlier. This would give me the number of times a player would have been driven in by his teammates if they were the St. Louis Cardinals and if that player had the same number of plate appearances as Coleman and performed as they performed in 1985. I then added the number of times they scored a run on their own power (home run).

The results of this are as follows:

PRO-RATED RUNS SCORED

Orta	82	Cowens	89	Lemon	97	Harper	87
Armas	98	Evans	106	Lyons	86		
Foster	99	Stone	85	Landreaux	90		

As you can see no one topped Coleman's total of 107 runs scored, but there are more things to baseball than just scoring runs--you must have the ability to knock them in also.

Elias' Baseball Analyst has a section on runners driven in from each base. This chart is found under each individual player and shows the number of times he got up with a runner on some particular base and the number of times he knocked him home. All I did to utilize this information was apply each percentage of the players I chose to the number of times Coleman batted with runners on whatever base. Then I totaled home runs and got a pro-rated number of runs batted in. These are the results:

PRO-RATED RUNS BATTED IN

Orta	60	Cowens	71	Lemon	67	Harper	70
Armas	77	Evans	65	Lyons	40		
Foster	81	Stone	25	Landreaux	55		

As we can see from these totals, only Jeff Stone and Steve Lyons did not match up to Coleman's run driving in ability. If we consider runs scored and runs batted in as equal, then ranking the players we get the following results.

TOTAL OF PRO-RATED RUNS SCORED AND RUNS BATTED IN

1.	Foster	179	6.	Harper	157	11.	Stone	110
2.	Armas	174	7.	COLEMAN	147			
3.	Evans	170	8.	Landreaux	146			
4.	Lemon	162	9.	Orta	142			
5.	Cowens	160	10.	Lyons	126			

The results are obvious. Even George Foster could have batted leadoff for the Cardinals because he would not have left on as many as Coleman. The bottom of the order does not get on much so when it does it is nice to have someone who can knock them in. Actually, the bottom of the Cardinals' order was not that bad so it would have certainly been to their advantage to have someone with the ability to knock them in at the leadoff spot.

What about the players St. Louis had and/or traded? Well, Lonnie Smith scored 103 pro-rated runs and knocked in 47 pro-rated runs. Tito Landrum's totals were 93 and 58. Both totals were ahead of Coleman's totals (150 and 151 respectively). One can argue that George Foster isn't as good an outfielder as Coleman and that would make the difference between the two and therefore Coleman would be more beneficial to the team. But he still cannot hit. If one insists that you need a base stealer up top to win, look at the 1986 Red Sox. Wade Boggs simply does not steal bases and the Red Sox score and score and score.

The only reason the other division leaders have legitimate base stealing threats is because every other team in both leagues has legitimate base stealing threats. Twenty-five of the 26 teams in 1986 had at least one player with 20 stolen base. My point is, you need someone in the leadoff spot who can hit, get on base and knock in runs, and not just a track star.

Percentage Baseball Reconsidered:
2. Preliminary 1984 Findings

Back in Analyst 16, I proposed a Markov model of the half-inning and a method for the detailed study of the implications of the model. Over the interim, the project which this proposal began has undergone some changes, partly as a result of Mark Pankin's helpful critique of the model (Analyst 19) and my response to his work (Analyst 21), and partly as a consequence of what I have learned while performing the analysis. Using Project Scoresheet data, I have completed a preliminary study of the 1984 season, which I will describe later in this article. However, as some new Analyst readers may be unfamiliar with the model, and as it has gone through some revision, I will begin with a summary of it.

We can consider the half-inning as a "system," or a set of interrelated "events." Events consist of plays that can occur; doubles and double plays, passed balls and pop ups. Before and after each event, the half-inning system will be in one of a finite number of "states," or base-out situations. Before an event, the system can be in any one of the following 24 states, symbolizd as in Pankin's criticism:

		Bases Occupied							
		None	1	2	3	1 & 2	1 & 3	2 & 3	All
	0	(0,0)	(1,0)	(2,0)	(3,0)	(12,0)	(13,0)	(23,0)	(123,0)
Outs	1	(0,1)	(1,1)	(2,1)	(3,1)	(12,1)	(13,1)	(23,1)	(123,1)
	2	(0,2)	(1,2)	(2,2)	(3,2)	(12,2)	(13,2)	(23,2)	(123,2)

However, there are far more than 24 states that can conceivably follow events. Most importantly, we must distinguish between events that bring new batters to the plate and events that maintain the same batter. For example,

New Batter Event
Starting state - runner on first, one out
Event - batter doubles, runner scores
Ending state - runner on second, one out, one run scores

Same Batter Event
Starting state - runner on first, one out
Event - passed ball
Ending state - runner on second, one out, no run scores

The two events have the same starting and ending states, but a different number of runs have scored. Thus, new-batter and same-batter events must be distinguished whenever there is a baserunner and the new batter event results in at least one run being scored. Same-batter events will then result in one less runs scoring than the analogous new-batter event. I will symbolize same-batter event ending states with the use of a prime; thus, the double ends with the state (2,1) and the passed ball with (2,1)′. In addition, we must consider the fact that either no, one, two, or three runs can score on the event resulting in the third out of the inning. All told, there are 24 new-batter ending states, 21 same-batter ending states (a same-batter event cannot end with bases loaded), and 4 end-of-inning end states, giving a total of 49 end states in all [1].

My chief concern is with the probability that an event will move the system from one state to another. This information can lead to very helpful insights. For example, when combined with the number of runs that will score given a particular event, we can compute the expected number of runs scored given a certain base-out situation. This computation in turn allows us to evaluate the value of various strategy options. These computations and evaluations have previously been performed, first by Earnshaw Cook (whose two books, Percentage Baseball and Percentage Baseball and the Computer, were the source of the title for my own articles), later by Pete Palmer (see Chapter 8 in John Thorn and Pete's The Hidden Game of Baseball). The conclusions of both concerning standard baseball strategy sometimes went against "orthodox" practices. For example, strategies designed to score single runs, such as the sacrifice bunt, are usually poor plays. The reason for this, in short, is that games are won by multirun explosions, and the purposeful sacrifice of an out makes such eruptions less likely (see their books for more detailed discussions).

This being the case, where did such strategies come from? Most simply, the dead-ball era (1900-1919), when the difficulty of scoring runs in bunches made the one-run strategy defensible. Overall, this is obviously not the case today. However, there are some ballparks, such as the Astrodome, where the absence of home runs leads us to at least raise the possibility that dead-ball-era strategy may still be desirable.

The chief goal of this present project is to continue the work of Cook and Palmer while distinguishing among good, average, and poor offensive ballparks in the process, in order to evaluate the relative value of different strategies in different types of parks. The immediate goal of this report is to explore the implications of the event-to-event probabilities themselves. This exploration may lead to some clues concerning exactly how offensive performance differs among these parks, and how they are similar.

Project Scoresheet provided the raw data for the project. The preliminary analysis of the raw data was time-consuming but easy, simply counting state-to-state transition for the 1984 season. The analysis was aided by the fact that Project Scoresheet data is in Account Form scoring. which includes base-out situations in its descriptions. As the eventual goal will be the evaluation of strategy, transitions were only counted if the event that proceeded it was clearly not strategic. The idea is to develop a description of non-strategic ("conventional") play, to serve as a baseline against which the effect of strategy can be tested. I defined four plays as strategic; stolen bases (including extra bases on wild throws during steal attempts), caught stealing, sacrifice bunts, or intentional walks. I included what would be scored as sacrifice flies, as it is questionable when, or even if, the sac fly is a purposeful strategy. The hit-and-run is also not recognizable as such from a scoresheet, and thus I cannot consider it a strategic move.

There are some problems with the analysis that need to be mentioned. First, a problem with Project scoring in general is that attempted steals thwarted by a pitcher are often scored as pickoffs and not, as they should be, as caught stealing. As a result, since I considered pickoffs as "conventional" baseball, they are actually overrepresented in my analysis and caught stealing analogously underestimated. Second, when a game ended on a run-scoring hit, I judged the end state conservatively. For example, if it is the bottom of the ninth, the score is tied, there are runners on first and second, and the batter singles in the winning run from second, I considered the end state as runners on first and second, although it is possible that the runner on first would have gotten to third if the play had occurred during other parts of the game.

The next step was to define ballparks as either batter's, pitcher's, or neutral parrks. One can get a "ballpark estimate" (sic) of ballpark effect by dividing the number of runs scored by the opposition at the ballpark in question by the number of runs scored by the opposition against the same pitching staff at the oppositions' home field. For example, to get the Fenway Park effect, divide the number of runs the Red Sox give up at home by the number of runs the Red Sox give up on the road. Subtracting 100 from this figure gives you a nice index scaled in percentages [2]. The Red Sox index of 17.7 means that their pitching staff gave up 17.7 percent more runs at home than on the road. While I wanted to define batter's parks as those with an index of 10 or more, and pitcher's parks as those with an index of -10 or less, the desire for an approximately equal number of parks in each category made this impossible. The results were

	American League		National League	
Batter's	Boston	17.7	Atlanta	34.7
	Chicago	12.1	Chicago	20.8
	California	9.3	Los Angeles	15.0
	Cleveland	8.7	Philadelphia	14.9
Neutral	Seattle	3.7	Cincinnati	4.0
	Texas	0.0	San Francisco	-5.0
	Minnesota	-0.3	New York	-6.3
	Toronto	-5.1	Saint Louis	-7.4
	Kansas City	-9.4		
Pitcher's	Milwaukee	-11.8	San Diego	-10.2
	Baltimore	-15.2	Pittsburgh	-13.4
	Detroit	-15.3	Houston	-13.7
	Oakland	-23.9	Montreal	-20.0
	New York	-24.5		

In the American League, this trichotomy was supported by the average number of opposition runs scored in them; the figures were 391.25 for the batter's parks, 350.6 for the neutral parks, and 316.2 for the pitcher's parks. It did not work so nicely for the National League; here the figures were 356.5 for the batter's parks, 352.75 for the neutral parks, and 278.75 for the pitcher's parks. Apparently, there was an inordinate amount of poor pitching by teams in neutral parks, leading them to give up as many runs at home as pitching staffs in batter's parks.

The next order of business was to figure out the probabilities of moving from state to state in the system. In Table 1, I list the number and percentage of times in each starting state, and the most probable end-states for each starting state, for detailed study. Two findings are worth noting. First, the proportions among beginning states vary considerably, so much so that the total number of occurrences for some beginning states are too low for the probabilities to be stable and trustworthy. Second, the proportions among beginning states hardly vary among batter's, neutral, and pitcher's parks. For example, the range of occurrence for (0,1) - no baserunners, one out - is merely 1.1 percent; from a high of 18.4 percent for National League pitcher's parks to a low of 17.3 percent for National League neutral parks. The range for (0,2) is similarly 1.1 percent, and no other states are even that variable. Thus, the proportion of beginning states does not differ very much among ballparks, so we must look elsewhere for the genesis of ballpark variation.

Rather than examining the specific state-to-state probabilities in Table 1, I will discuss four indices I deduced from them. "No out percentage" (NOP) is the proportion of new-batter events in which no outs were made. It differs from on-base percentage in that it does not credit, for example, singles in which baserunners are thrown out on the basepaths, and it does credit, for example, getting on base due to error. "No out bases" (NOB) is to, say, Runs Created as NOP is to OBA; it is the average number of bases the batter achieves on no-out plays per new-batter event. "Run Percentage" is the proportion of times that one or more runs scores in the next play, while "Runs Expected" is the number of runs expected on the next play. The distinction is necessary for eventual analysis of strategy, because it is at least possible that, for exmaple, the sacrifice bunt increases the probability of scoring a run while decreasing the number of runs expected to score [3].

Table 2 presents data for these four indices for the three types of ballparks at each base-out situation for each league. Due to small sample sizes, the numbers are sometimes absurd; from a high of .476 NOP and 1.000 NOB for (3,0) in AL pitcher's parks to a low of .133 NOP and NOB for (23,0) in NL pitcher's parks. The data for the situations with a sample size of 500 or more (see Table 1 for sample sizes) is probably pretty trustworthy. Anyway, a perusal of the data shows the expected; batter's parks tend to be highest, neutral parks intermediate, and pitcher's parks lowest. More interesting is the finding that these differences are not necessarily uniform but may vary systematically. For example, the following table shows the data summed for different numbers of baserunners. In the American League, run production did not differ between batter's and neutral parks with no or one baserunner, but was far higher in batter's parks with two or three baserunners. In contrast, neutral parks differ more from pitcher's parks with few than with several runners. As one would expect, NOP and, to a greater degree, NOB parrot these trends. The National League is not as clear, but again, run production with one runner did not distinguish batter's and neutral parks.

	No Out Per.			No Out Bases			Run Percentage			Runs Expected		
R'ers	Bat.	Neu.	Pit.	Bat.	Neu.	Pit.	Bat.	Neu.	Pit.	Bat.	Neu.	Pit.
					American League							
0	.330	.322	.321	.460	.455	.426	.025	.025	.019	.025	.025	.019
1	.355	.343	.338	.505	.482	.461	.114	.114	.095	.140	.136	.118
2	.320	.297	.291	.450	.413	.405	.308	.265	.254	.388	.318	.322
3	.335	.316	.292	.452	.408	.449	.547	.480	.484	.790	.687	.729
					National League							
0	.316	.330	.307	.427	.438	.407	.020	.018	.016	.020	.018	.016
1	.347	.325	.332	.471	.447	.430	.111	.113	.103	.129	.131	.119
2	.318	.311	.258	.429	.435	.352	.305	.267	.229	.384	.337	.296
3	.306	.322	.238	.461	.441	.316	.462	.507	.411	.761	.740	.593

One year of analysis is little to go on, but the possibility exists that the difference in run production among ballparks is not uniform for different numbers of baserunners.

Ball park variation in run production can also be found in comparisons for different numbers of outs:

	No Out Per.			No Out Bases			Run Percentage			Runs Expected		
Outs	Bat.	Neu.	Pit.	Bat.	Neu.	Pit.	Bat.	Neu.	Pit.	Bat.	Neu.	Pit.
					American League							
0	.340	.315	.317	.506	.440	.435	.073	.059	.060	.087	.069	.074
1	.328	.337	.325	.466	.484	.434	.121	.112	.094	.144	.135	.113
2	.332	.323	.320	.455	.449	.429	.099	.098	.084	.131	.124	.111
					National League							
0	.333	.335	.306	.450	.458	.405	.071	.061	.047	.080	.069	.052
1	.322	.321	.314	.436	.430	.413	.109	.104	.095	.131	.127	.113
2	.319	.322	.302	.436	.433	.397	.096	.097	.076	.128	.125	.100

Note that in both leagues, differences between batter's and neutral parks are most evident with no outs, while differences between neutral and pitcher's parks are strongest with two outs. In the American League, NOP and NOB follow suit, but not in the National League. Again, these findings must be considered preliminary only, and need to be replicated across several seasons.

The next analysis would be the computation of run percentage and runs expected for the rest of the inning, given each base-out situation. This will allow the comparison of strategic moves in each type of ballpark. I did not make this analysis for two reasons. First, I do not as yet have a computer program to do the necessary arithmetic; can anyone help here? Second, the sample sizes of many base-out situations are too low to make the analysis trustworthy. I'm currently working on the 1985 Scoresheet Data, which I will add on to the 1984. I hope to continue this each year that I am able; again, any help would be great.

NOTES

1 - My claim of 43 in my reply to Pankin was wrong.

2 - Thanks to Pete Palmer for his help here. Incidentally, the percentages reported in the Baseball Encyclopedia are often wrong and should never be trusted.

3 - While Run Percentage and Runs Expected are based on the total number of "conventional" plays, NOP and NOB are based on the number of conventional new-batter events only.

Table 1.1 - Event-to-Event Transition Probabilities

American League Batter's Parks - Beginning States

	(0,0)	(0,1)	(0,2)	(1,0)
Number	3025	2185	1737	672
Percentage	.241	.174	.138	.053
End States	(0,1) .670	(0,2) .676	(0,3) .661	(1,1) .426
	(1,0) .249	(1,1) .246	(1,2) .274	(12,0) .189
	(2,0) .050	(2,1) .044	(2,2) .042	(0,2) .121
	(0,0) .025	(0,1) .029	(0,2) .019	(2,1) .077
	(3,0) .005	(3,1) .005	(3,2) .004	(13,0) .063

American League Neutral Parks - Beginning States

	(0,0)	(0,1)	(0,2)	(1,0)
Number	3805	2809	2157	798
Percentage	.242	.179	.137	.051
End States	(0,1) .690	(0,2) .663	(0,3) .679	(1,1) .457
	(1,0) .234	(1,1) .257	(1,2) .248	(12,0) .202
	(2,0) .045	(2,1) .043	(2,2) .046	(0,2) .108
	(0,0) .024	(0,1) .030	(0,2) .020	(2,1) .075
	(3,0) .006	(3,1) .007	(3,2) .007	(13,0) .053

American League Pitcher's Parks - Beginning States

	(0,0)	(0,1)	(0,2)	(1,0)
Number	3703	2707	2139	824
Percentage	.245	.179	.141	.054
End States	(0,1) .692	(0,2) .679	(0,3) .658	(1,1) .447
	(1,0) .248	(1,1) .262	(1,2) .276	(12,0) .204
	(2,0) .034	(2,1) .038	(2,2) .041	(0,2) .120
	(0,0) .020	(0,1) .017	(0,2) .020	(2,1) .060
	(3,0) .006	(3,1) .005	(3,2) .005	(13,0) .034

National League Batter's Parks - Beginning States

	(0,0)	(0,1)	(0,2)	(1,0)
Number	2890	2078	1694	607
Percentage	.244	.175	.143	.051
End States	(0,1) .679	(0,2) .689	(0,3) .687	(1,1) .405
	(1,0) .252	(1,1) .251	(1,2) .246	(12,0) .186
	(2,0) .043	(2,1) .032	(2,2) .042	(0,2) .130
	(0,0) .020	(0,1) .021	(0,2) .019	(2,1) .084
	(3,0) .007	(3,1) .007	(3,2) .006	(13,0) .077

National League Neutral Parks - Beginning States

	(0,0)	(0,1)	(0,2)	(1,0)
Number	3043	2157	1735	648
Percentage	.244	.173	.139	.052
End States	(0,1) .665	(0,2) .681	(0,3) .665	(1,1) .406
	(1,0) .259	(1,1) .260	(1,2) .270	(12,0) .184
	(2,0) .048	(2,1) .038	(2,2) .049	(0,2) .145
	(0,0) .020	(0,1) .018	(0,2) .013	(13,0) .072
	(3,0) .008	(3,1) .004	(3,2) .003	(2,1) .048

National League Pitcher's Parks - Beginning States

	(0,0)	(0,1)	(0,2)	(1,0)
Number	3039	2262	1817	609
Percentage	.248	.184	.148	.050
End States	(0,1) .693	(0,2) .698	(0,3) .687	(1,1) .420
	(1,0) .241	(1,1) .242	(1,2) .260	(12,0) .212
	(2,0) .042	(2,1) .037	(2,2) .037	(0,2) .135
	(0,0) .017	(0,1) .019	(0,2) .012	(2,1) .071
	(3,0) .007	(3,1) .004	(3,2) .004	(13,0) .067

Table 1.2 - Event-to-Event Transition Probabilities

American League Batter's Parks - Beginning States

	(1,1)	(1,2)	(2,0)	(2,1)
Number	827	912	206	358
Percentage	.066	.073	.016	.028
End States	(1,2) .445	(0,3) .647	(2,1) .383	(2,2) .436
	(12,1) .193	(12,2) .184	(3,1) .218	(3,2) .159
	(0,3) .122	(13,2) .063	(13,0) .117	(12,1) .128
	(2,2) .067	(23,2) .026	(12,0) .107	(13,1) .070
	(13,1) .060	(0,2) .025	(1,0) .063	(1,1) .064

American League Neutral Parks - Beginning States

	(1,1)	(1,2)	(2,0)	(2,1)
Number	1080	1072	256	462
Percentage	.069	.068	.016	.029
End States	(1,2) .478	(0,3) .657	(2,1) .387	(2,2) .424
	(12,1) .198	(12,2) .189	(3,1) .230	(3,2) .169
	(0,3) .106	(13,2) .052	(12,0) .117	(12,1) .128
	(2,2) .056	(23,2) .024	(13,0) .082	(2,1) .082
	(13,1) .041	(2,2)' .022	(2,0) .070	(1,1) .065

American League Pitcher's Parks - Beginning States

	(1,1)	(1,2)	(2,0)	(2,1)
Number	1052	1107	188	415
Percentage	.070	.073	.012	.027
End States	(1,2) .447	(0,3) .662	(2,1) .441	(2,2) .436
	(12,1) .184	(12,2) .206	(3,1) .218	(3,2) .171
	(0,3) .125	(13,2) .055	(1,0) .085	(12,1) .145
	(13,1) .066	(0,2) .022	(12,0) .080	(13,1) .075
	(2,2) .053	(23,2) .019	(13,0) .080	(1,1) .063

National League Batter's Parks - Beginning States

	(1,1)	(1,2)	(2,0)	(2,1)
Number	729	757	196	364
Percentage	.062	.064	.017	.031
End States	(1,2) .438	(0,3) .646	(2,1) .357	(2,2) .473
	(12,1) .191	(12,2) .184	(3,1) .199	(12,1) .140
	(0,3) .104	(13,2) .069	(12,0) .117	(3,2) .137
	(2,2) .071	(23,2) .033	(13,0) .117	(1,1) .080
	(13,1) .064	(0,2) .021	(1,0) .061	(13,1) .052

National League Neutral Parks - Beginning States

	(1.1)	(1,2)	(2,0)	(2,1)
Number	753	885	236	397
Percentage	.060	.071	.019	.032
End States	(1,2) .495	(0,3) .681	(2,1) .415	(2,2) .489
	(12,1) .174	(12,2) .176	(3,1) .246	(3,2) .141
	(0,3) .096	(13,2) .056	(12,0) .081	(12,1) .121
	(2,2) .065	(2,2)' .020	(1,0) .076	(13,1) .063
	(13,1) .052	(23,2) .018	(13,0) .076	(1,1) .053

National League Pitcher's Parks - Beginning States

	(1,1)	(1,2)	(2,0)	(2,1)
Number	739	772	204	377
Percentage	.060	.063	.017	.031
End States	(1,2) .428	(0,3) .646	(2,1) .441	(2,2) .427
	(12,1) .194	(12,2) .189	(3,1) .225	(3,2) .180
	(0,3) .131	(13,2) .056	(12,0) .098	(12,1) .127
	(13,1) .069	(2,2)' .036	(13,0) .069	(1,1) .069
	(2,2) .057	(0,2) .025	(1,0) .054	(13,1) .056

Table 1.3 - Event-to-Event Transition Probabilities

American League Batter's Parks - Beginning States

	(2,2)	(3,0)	(3,1)	(3,2)
Number	439	43	126	191
Percentage	.035	.073	.010	.015
End States	(0,3) .679	(3,1) .326	(3,2) .325	(0,3) .623
	(1,2) .103	(0,1) .186	(0,2) .246	(1,2) .157
	(12,2) .100	(13,0) .163	(1,1) .206	(13,2) .136
	(2,2) .041	(1,0) .140	(13,1) .119	(0,2) .037
	(3,2)′.027	(2,0) .070	(2,1) .040	(2,2) .026

American League Neutral Parks - Beginning States

	(2,2)	(3,0)	(3,1)	(3,2)
Number	584	44	180	259
Percentage	.037	.003	.011	.016
End States	(0,3) .627	(3,1) .455	(3,2) .372	(0,3) .598
	(12,2) .115	(0,1) .273	(1,1) .222	(13,2) .154
	(1,2) .082	(1,0) .114	(0,2) .183	(1,2) .131
	(2,2) .065	(13,0) .106	(13,1) .106	(2,2) .054
	(13,2) .046	(2,0) .045	(2,1) .044	(0,2) .042

American League Pitcher's Parks - Beginning States

	(2,2)	(3,0)	(3,1)	(3,2)
Number	483	42	121	203
Percentage	.032	.003	.008	.013
End States	(0,3) .646	(3,1) .310	(3,2) .331	(0,3) .675
	(12,2) .122	(0,1) .214	(0,2) .231	(1,2) .143
	(1,2) .108	(1,0) .167	(13,1) .157	(13,2) .103
	(2,2) .037	(0,0) .143	(1,1) .149	(2,2) .034
	(13,2) .033	(13,0) .095	(0,1) .041	(0,2)′.020

National League Batter's Parks - Beginning States

	(2,2)	(3,0)	(3,1)	(3,2)
Number	467	43	124	151
Percentage	.039	.004	.010	.013
End States	(0,3) .672	(0,1) .302	(3,2) .298	(0,3) .636
	(12,2) .103	(1,0) .209	(0,2) .282	(1,2) .159
	(1,2) .092	(3,1) .186	(1,1) .145	(13,2) .132
	(2,2) .049	(13,0) .186	(13,1) .089	(2,2) .026
	(13,2) .043	(2,0) .093	(2,1) .073	(0,2)′.020

National League Neutral Parks - Beginning States

	(2,2)	(3,0)	(3,1)	(3,2)
Number	507	39	159	189
Percentage	.041	.003	.013	.015
End States	(0,3) .649	(3,1) .487	(3,2) .308	(0,3) .672
	(1,2) .110	(0,1) .179	(0,2) .226	(1,2) .138
	(12,2) .093	(1,0) .179	(1,1) .195	(13,2) .116
	(2,2) .075	(13,0) .103	(13,1) .119	(2,2) .026
	(13,2) .030	(2,0) .026	(2,1) .057	(0,2)′.026

National League Pitcher's Parks - Beginning States

	(2,2)	(3,0)	(3,1)	(3,2)
Number	479	45	132	181
Percentage	.039	.004	.011	.015
End States	(0,3) .662	(3,1) .400	(3,2) .326	(0,3) .669
	(12,2) .144	(0,1) .267	(0,2) .265	(1,2) .133
	(1,2) .071	(1,0) .156	(1,1) .136	(13,2) .122
	(2,2) .050	(13,0) .133	(13,1) .106	(2,2) .028
	(13,2) .023	(3,0) .044	(1,2) .053	(0,2)′.028

Table 1.4 - Event-to-Event Transition Probabilities

American League Batter's Parks - Beginning States

	(12,0)	(12,1)	(12,2)	(13,0)
Number	160	308	407	93
Percentage	.013	.024	.032	.007
End States	(12,1) .312	(12,2) .351	(0,3) .671	(1,1) .215
	(123,0) .169	(0,3) .146	(123,2) .118	(13,1) .183
	(13,1) .125	(13,2) .104	(12,2) .074	(12,0) .172
	(3,2) .088	(123,1) .097	(13,2) .054	(0,2) .075
	(23,0) .081	(23,2) .052	(23,2) .027	(2,1) .075

American League Neutral Parks - Beginning States

	(12,0)	(12,1)	(12,2)	(13,0)
Number	192	393	536	83
Percentage	.012	.025	.034	.005
End States	(12,1) .349	(12,2) .389	(0,3) .711	(13,1) .229
	(123,0) .177	(123,1) .127	(123,2) .104	(1,1) .205
	(13,1) .099	(0,3) .125	(12,2) .067	(0,2) .096
	(3,2) .089	(13,2) .104	(13,2) .037	(12,0) .096
	(23,1) .083	(23,2) .053	(0,2) .021	(2,1) .072

American League Pitcher's Parks - Beginning States

	(12,0)	(12,1)	(12,2)	(13,0)
Number	182	379	524	79
Percentage	.012	.025	.035	.005
End States	(12,1) .379	(12,2) .391	(0,3) .698	(1,1) .203
	(123,0) .170	(0,3) .140	(123,2) .107	(13,1) .203
	(13,1) .110	(123,1) .132	(12,2) .052	(0,2) .114
	(3,2) .093	(13,2) .103	(13,2) .048	(13,0) .089
	(23,1) .060	(23,2) .042	(23,2) .025	(2,1) .076

National League Batter's Parks - Beginning States

	(12,0)	(12,1)	(12,2)	(13,0)
Number	150	293	375	94
Percentage	.013	.025	.032	.008
End States	(12,1) .333	(12,2) .365	(0,3) .675	(1,1) .245
	(123,0) .153	(0,3) .137	(123,2) .088	(13,1) .213
	(13,1) .127	(13,2) .126	(12,2) .069	(12,0) .191
	(23,1) .073	(123,1) .099	(13,2) .053	(0,2) .085
	(3,2) .067	(23,2) .065	(23,2) .040	(23,0) .053

National League Neutral Parks - Beginning States

	(12,0)	(12,1)	(12,2)	(13,0)
Number	145	273	412	76
Percentage	.012	.022	.033	.006
End States	(12,1) .352	(12,2) .399	(0,3) .692	(13,1) .250
	(123,0) .172	(123,1) .128	(123,2) .099	(1,1) .211
	(13,1) .124	(13,2) .125	(13,2) .044	(12,0) .105
	(3,2) .083	(0,0) .125	(12,2) .034	(2,1) .092
	(12,1) .062	(23,2) .062	(23,2) .032	(23,1) .079

National League Pitcher's Parks - Beginning States

	(12,0)	(12,1)	(12,2)	(13,0)
Number	136	279	390	63
Percentage	.011	.023	.032	.005
End States	(12,1) .434	(12,2) .380	(0,0) .751	(1,1) .286
	(123,0) .132	(0,0) .186	(123,2) .097	(13,1) .254
	(13,1) .110	(123,1) .115	(12,2) .044	(0,2) .079
	(3,2) .088	(13,2) .082	(13,2) .033	(12,0) .063
	(23,1) .044	(23,2) .068	(23,2) .018	(2,1) .048

Table 1.5 - Event-to-Event Transition Probabilities

American League Batter's Parks - Beginning States

	(13,1)		(13,2)		(23,0)		(23,1)	
Number	166		203		53		88	
Percentage	.013		.016		.004		.007	
End States	(1,2)	.259	(0,0)	.655	(23,1)	.472	(23,2)	.284
	(13,2)	.169	(12,2)	.138	(3,1)	.113	(2,2)	.170
	(0,0)	.151	(123,2)	.059	(123,0)	.113	(3,2)	.148
	(12,1)	.114	(13,2)	.054	(1,0)	.075	(12,2)	.102
	(2,2)	.084	(23,2)	.030	(13,0)	.075	(123,1)	.068

American League Neutral Parks - Beginning States

	(13,1)		(13,2)		(23,0)		(23,1)	
Number	169		230		42		101	
Percentage	.011		.015		.003		.006	
End States	(1,2)	.207	(0,0)	.648	(23,1)	.381	(23,2)	.406
	(13,2)	.189	(12,2)	.152	(2,1)	.167	(3,2)	.129
	(12,1)	.148	(13,2)	.070	(3,1)	.167	(13,1)	.129
	(0,0)	.136	(123,2)	.035	(13,0)	.071	(2,1)	.079
	(123,1)	.095	(23,2)	.022	(123,0)	.071	(123,1)	.040

American League Pitcher's Parks - Beginning States

	(13,1)		(13,2)		(23,0)		(23,1)	
Number	184		223		44		98	
Percentage	.012		.015		.003		.006	
End States	(1,2)	.228	(0,0)	.668	(23,1)	.341	(23,2)	.388
	(0,0)	.168	(12,2)	.112	(3,1)	.205	(123,1)	.163
	(13,2)	.168	(123,2)	.081	(2,1)	.159	(3,2)	.143
	(12,1)	.125	(23,2)	.027	(2,0)	.068	(2,2)	.102
	(123,1)	.071	(13,2)	.022	(123,0)	.068	(2,1)	.051

National League Batter's Parks - Beginning States

	(13,1)		(13,2)		(23,0)		(23,1)	
Number	148		203		49		86	
Percentage	.012		.017		.004		.007	
End States	(0,0)	.162	(0,0)	.685	(23,1)	.286	(23,2)	.314
	(1,2)	.162	(12,2)	.084	(3,1)	.163	(1,1)	.151
	(13,2)	.162	(123,2)	.079	(13,0)	.143	(2,2)	.116
	(12,1)	.149	(13,2)	.050	(1,0)	.082	(3,2)	.116
	(13,1)	.122	(2,2)	.030	(123,0)	.082	(123,1)	.093

National League Neutral Parks - Beginning States

	(13,1)		(13,2)		(23,0)		(23,1)	
Number	145		198		38		70	
Percentage	.012		.016		.003		.006	
End States	(13,2)	.207	(0,0)	.626	(23,1)	.474	(23,2)	.286
	(0,0)	.152	(12,2)	.136	(2,1)	.132	(123,1)	.186
	(1,2)	.145	(123,2)	.071	(3,1)	.132	(2,2)	.129
	(12,1)	.110	(13,2)	.045	(13,0)	.105	(3,2)	.086
	(123,1)	.089	(23,2)	.040	(123,0)	.105	(13,1)	.086

National League Pitcher's Parks - Beginning States

	(13,1)		(13,2)		(23,0)		(23,1)	
Number	137		165		31		82	
Percentage	.011		.013		.003		.007	
End States	(13,2)	.285	(0,0)	.745	(23,1)	.581	(23,2)	.341
	(1,2)	.175	(123,2)	.085	(3,1)	.161	(2,2)	.134
	(0,0)	.139	(12,2)	.079	(2,1)	.097	(123,1)	.134
	(2,2)	.088	(13,2)	.024	(13,0)	.097	(13,1)	.098
	(12,1)	.080	(23,2)	.018	(123,0)	.032	(1,1)	.061

Table 1.6 - Event-to-Event Transition Probabilities

American League Batter's Parks - Beginning States

	(23,2)		(123,0)		(123,1)		(123,2)	
Number	106		54		107		106	
Percentage	.008		.004		.009		.008	
End States	(0,0)	.651	(123,0)	.241	(123,2)	.196	(0,0)	.698
	(1,2)	.113	(13,1)	.222	(123,1)	.187	(13,2)	.075
	(123,2)	.104	(123,1)	.222	(0,0)	.131	(123,2)	.075
	(2,2)	.047	(23,1)	.074	(13,2)	.131	(12,2)	.057
	(13,2)	.028	(3,2)	.056	(12,2)	.084	(2,2)	.028

American League Neutral Parks - Beginning States

	(23,2)		(123,0)		(123,1)		(123,2)	
Number	125		48		125		156	
Percentage	.008		.003		.008		.010	
End States	(0,0)	.712	(123,1)	.354	(123,2)	.272	(0,0)	.654
	(123,2)	.112	(123,0)	.146	(0,0)	.144	(123,2)	.192
	(2,2)	.064	(3,2)	.104	(12,2)	.112	(12,2)	.058
	(1,2)	.040	(13,1)	.104	(13,2)	.112	(13,2)	.032
	(3,2)	.024	(12,1)	.083	(123,1)	.112	(2,2)	.013

American League Pitcher's Parks - Beginning States

	(23,2)		(123,0)		(123,1)		(123,2)	
Number	131		44		122		144	
Percentage	.009		.003		.007		.010	
End States	(0,0)	.725	(123,0)	.182	(123,2)	.246	(0,0)	.694
	(123,2)	.107	(123,1)	.182	(0,0)	.180	(123,2)	.097
	(1,2)	.046	(0,0)	.114	(12,2)	.156	(23,2)	.056
	(2,2)	.046	(3,2)	.114	(123,1)	.148	(13,2)	.049
	(13,2)	.031	(13,1)	.091	(13,2)	.107	(12,2)	.035

National League Batter's Parks - Beginning States

	(23,2)		(123,0)		(123,1)		(123,2)	
Number	118		38		80		116	
Percentage	.010		.003		.007		.010	
End States	(0,0)	.644	(123,1)	.289	(123,2)	.312	(0,0)	.681
	(1,2)	.119	(13,0)	.132	(0,0)	.138	(123,2)	.095
	(123,2)	.119	(123,0)	.105	(13,2)	.138	(13,2)	.086
	(2,2)	.076	(13,1)	.079	(123,1)	.088	(2,2)	.034
	(0,2)	.017	(23,1)	.079	(23,2)	.075	(12,2)	.034

National League Neutral Parks - Beginning States

	(23,2)		(123,0)		(123,1)		(123,2)	
Number	94		50		124		118	
Percentage	.008		.004		.010		.009	
End States	(0,0)	.606	(123,1)	.300	(123,2)	.234	(0,0)	.695
	(1,2)	.117	(13,1)	.200	(123,1)	.169	(123,2)	.119
	(123,2)	.106	(123,0)	.140	(0,0)	.145	(12,2)	.042
	(13,2)	.053	(3,2)	.080	(13,2)	.113	(23,2)	.042
	(2,2)	.043	(12,1)	.080	(12,2)	.089	(13,2)	.025

National League Pitcher's Parks - Beginning States

	(23,2)		(123,0)		(123,1)		(123,2)	
Number	97		25		92		114	
Percentage	.008		.002		.007		.009	
End States	(0,0)	.680	(123,1)	.320	(123,2)	.283	(0,0)	.746
	(1,2)	.113	(13,1)	.200	(0,0)	.185	(123,2)	.070
	(2,2)	.062	(3,2)	.160	(123,1)	.152	(13,2)	.061
	(123,2)	.062	(12,1)	.120	(12,2)	.141	(23,2)	.035
	(13,2)	.041	(123,0)	.080	(13,2)	.120	(12,2)	.026

Table 2 - Lots of Results

	No Out Per. Bat.	Neu.	Pit.	No Out Bases Bat.	Neu.	Pit.	Run Percentage Bat.	Neu.	Pit.	Runs Expected Bat.	Neu.	Pit.
American League												
(0,0)	.329	.310	.308	.465	.438	.414	.025	.024	.020	.025	.024	.020
(0,1)	.324	.337	.321	.464	.484	.420	.029	.030	.017	.029	.030	.017
(0,2)	.339	.321	.342	.446	.441	.453	.019	.020	.020	.019	.020	.020
(1,0)	.358	.334	.348	.524	.462	.480	.054	.039	.041	.079	.065	.063
(1,1)	.343	.333	.340	.494	.482	.477	.055	.056	.048	.085	.080	.071
(1,2)	.338	.324	.324	.486	.448	.428	.059	.050	.038	.084	.070	.060
(2,0)	.355	.341	.314	.448	.450	.432	.127	.141	.149	.142	.149	.170
(2,1)	.352	.368	.351	.490	.547	.447	.139	.180	.133	.161	.202	.147
(2,2)	.300	.352	.334	.418	.499	.447	.173	.177	.172	.191	.194	.195
(3,0)	.452	.250	.476	.690	.295	1.000	.466	.432	.595	.489	.432	.738
(3,1)	.400	.410	.395	.528	.545	.571	.532	.493	.479	.556	.515	.521
(3,2)	.370	.395	.308	.529	.594	.399	.240	.247	.222	.277	.289	.236
(12,0)	.393	.326	.318	.581	.417	.436	.220	.145	.148	.290	.182	.209
(12,1)	.300	.285	.290	.468	.433	.400	.213	.176	.156	.296	.258	.211
(12,2)	.322	.274	.275	.437	.385	.383	.201	.168	.172	.264	.232	.227
(13,0)	.363	.309	.312	.461	.444	.506	.656	.637	.696	.689	.709	.772
(13,1)	.280	.361	.316	.335	.494	.452	.565	.539	.549	.589	.599	.614
(13,2)	.330	.323	.304	.473	.426	.421	.287	.308	.229	.362	.369	.296
(23,0)	.346	.262	.250	.538	.310	.386	.377	.549	.545	.566	.669	.682
(23,1)	.233	.286	.313	.349	.347	.396	.521	.487	.408	.667	.567	.510
(23,2)	.320	.270	.248	.417	.402	.333	.243	.176	.168	.439	.312	.282
(123,0)	.370	.313	.409	.574	.396	.818	.778	.647	.818	1.037	.857	1.318
(123,1)	.362	.295	.250	.429	.418	.308	.673	.584	.574	.850	.824	.705
(123,2)	.288	.333	.291	.413	.405	.454	.302	.346	.306	.601	.524	.569
National League												
(0,0)	.321	.335	.307	.436	.460	.415	.020	.020	.017	.020	.020	.017
(0,1)	.311	.319	.302	.419	.417	.405	.021	.018	.019	.021	.018	.019
(0,2)	.313	.335	.313	.424	.428	.394	.019	.013	.012	.019	.013	.012
(1,0)	.354	.361	.336	.487	.501	.406	.044	.046	.026	.063	.066	.034
(1,1)	.355	.312	.360	.494	.445	.455	.047	.042	.045	.069	.065	.066
(1,2)	.340	.301	.326	.474	.409	.459	.048	.043	.053	.069	.060	.078
(2,0)	.389	.313	.294	.523	.451	.381	.143	.148	.118	.163	.178	.123
(2,1)	.345	.317	.343	.445	.430	.431	.151	.131	.149	.165	.146	.170
(2,2)	.312	.337	.315	.415	.472	.415	.163	.207	.148	.176	.221	.159
(3,0)	.512	.333	.333	.674	.436	.422	.628	.410	.467	.651	.436	.467
(3,1)	.328	.397	.312	.443	.506	.400	.532	.516	.485	.540	.528	.500
(3,2)	.347	.304	.313	.422	.380	.392	.225	.212	.210	.232	.228	.215
(12,0)	.342	.360	.260	.445	.446	.336	.193	.186	.132	.227	.214	.182
(12,1)	.270	.267	.265	.379	.363	.396	.181	.154	.154	.235	.194	.229
(12,2)	.301	.283	.230	.425	.456	.313	.221	.182	.133	.283	.248	.177
(13,0)	.326	.216	.206	.382	.230	.317	.681	.513	.571	.681	.513	.635
(13,1)	.371	.357	.276	.490	.500	.328	.581	.476	.467	.635	.566	.489
(13,2)	.298	.351	.241	.419	.469	.327	.232	.303	.170	.310	.369	.218
(23,0)	.404	.263	.133	.447	.316	.133	.592	.421	.387	.694	.474	.387
(23,1)	.376	.386	.407	.471	.514	.593	.512	.457	.463	.733	.614	.659
(23,2)	.350	.374	.295	.487	.527	.368	.237	.287	.258	.466	.511	.433
(123,0)	.368	.271	.200	.500	.333	.240	.711	.700	.68[illegible]	1.053	.860	.840
(123,1)	.266	.380	.239	.430	.512	.250	.550	.621	.53	.813	.887	.630
(123,2)	.313	.282	.246	.470	.410	.386	.319	.305	.254	.629	.537	.509