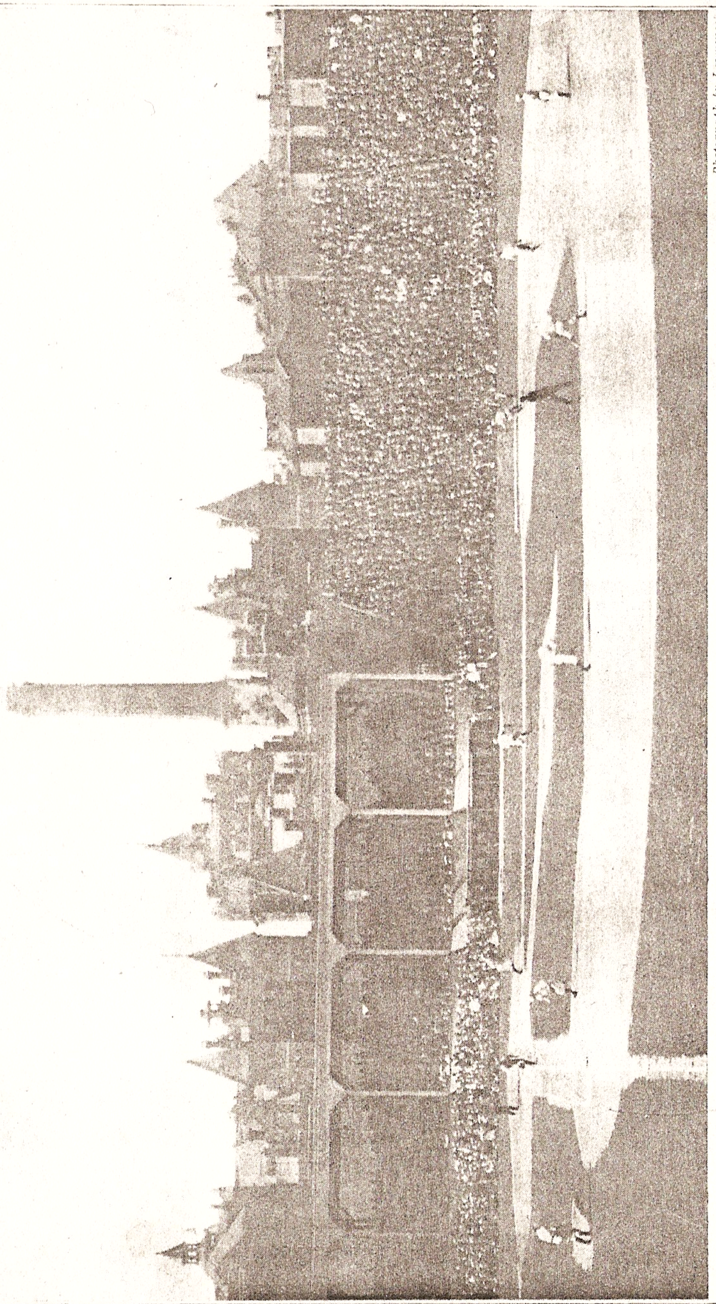

Photograph by Lawrence.

This play shows the Chicago National League team on the defensive at their home grounds in the game against the New York Giants on July 28, 1908. The batter has bunted the ball toward third base and is making his dash to first. The New York runners at first and second are already halfway to the next base. Chance is hurrying back to cover first base. Evers is racing to second and Steinfeldt has rushed to third, knowing the ball will be thrown there. Brown and Kling are running to field the ball. The photograph shows every man but Tinker in action. The bunt was perfect; Brown made the play to third base, but the runner got the decision; three runs were made later and Chicago was beaten 3 to 1

THE AMERICAN MAGAZINE

VOL. LXX *MAY, 1910* *No. 1*

THE INSIDE GAME

THE SCIENCE OF BASEBALL

BY HUGH S. FULLERTON

AUTHOR OF "THE SPRING TRAINING," ETC.

ILLUSTRATED WITH PHOTOGRAPHS AND DIAGRAMS

ONCE the City Editor sent me to a meeting of an engineering society to report a lecture. In the course of his remarks the lecturer said: "At a distance of 185 miles this force, roughly speaking, is one two hundred and forty millionth part of a watt." Fearing he might begin to speak gently I decamped, but ever since then I have regretted that I did not stay and sign that rough-spoken gentleman to work out the mathematics of baseball.

I know that it is ninety feet from first base to second base, ninety feet from second base to third base, and that a baseball batted between those points is fair. I know that approximately 20 out of every 100 balls batted fair during the season are "safe hits." I know that of 1,284 ground balls batted during the season of 1909 in the American and National leagues (1,284 chosen at random) 138 got past the infielders. I know that infielders of the National League (pitchers not included) fielded 9,382 ground balls errorlessly during the season of 1909. But how many millionths of a watt constitutes the chances of a hit being safe I cannot figure out. The average speed of fifty ground balls hit in three games during which three of us held twentieth-of-a-second watches we calculated to be 100 feet in one and three-twentieth seconds. We know that the third baseman plays ordinarily about 96 feet from the home plate, that the short stop playing "middling deep" is about 130 feet from the batter, that the second baseman is about two feet closer, and the first baseman 90 feet when a runner is on first base and 102 when no one is on bases. Given the speed and direction of the ball and the speed of the player, it is possible to figure to a millionth of a watt where his hands will meet the ball; but just as you start to write Q. E. D. the ball will take a bad bound. Given the average speed of the infielders, it would be possible to calculate beforehand approximately the number of base hits each team will make in a season—if the players were automatons.

The study of geometrical baseball is interesting in itself. Every ball player knows there are five "infield grooves" and four "outfield grooves," spaces between fielders where any ball hit with moderate force will be "safe" unless a marvelous stop intervenes. It is certain that the first base groove is a foot and a half wide at first base, and widens gradually through the outfield. There is a space $7\frac{1}{2}$ feet wide between the territories covered by the first and second basemen through which the ball ought to be able to escape, as neither man can move fast enough to reach it. There is a gap in the defense directly over second base $7\frac{1}{2}$ feet wide which is safe territory unless the pitcher, at the risk of his life, blocks the ball as it tries to pass him. The gap between the short stop and third baseman is $8\frac{1}{2}$ feet wide, a foot wider than between the first and second baseman, because the ball goes faster in that direction and the space between the third baseman's