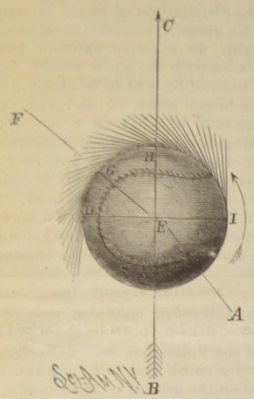
GW
GREEN-WOOD


IN
MEMORIAM
HENRY CHADWICK
"FATHER OF BASE BALL"
BORN OCT. 5, 1824
DIED APRIL 20, 1908

THE ART OF PITCHING IN BASEBALL.

BY HENRY CHADWICK.

In these days of remarkable exhibitions of skill in playing baseball by professional exemplars of the game, one cannot look back to the early period in the history of baseball without being struck with the great contrast between the work done on the diamond fields at Hoboken, in the "fifties," and that which marks the play of the leading professional teams of the present era. The game has been wonderfully improved since its boyhood days, and in nothing so much as in the great degree of skill now shown in the pitching department. In fact, the pitch-

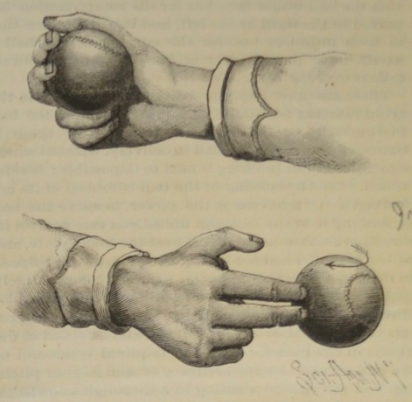


CUT A.—DIAGRAM OF THE ROTARY MOTION OF THE BALL ON ITS OWN AXIS.

ing of the present day is marked by an amount of skill, dexterity, and the accurate performance of the work experience has taught, which Webster defines as characteristic of an art. Without writing an essay on the subject, I will merely refer to what this art consists of in its application to the pitching of the period. In the first place, modern pitching excels the old method of delivering the ball to the bat in one special feature, and that is in *the horizontal curve of the ball through the air*, something practically unknown in the days of old on the historic Elysian Fields at Hoboken. It is in this one respect, in fact, that its advance has been so noteworthy; for in some other essentials of success in pitching, the veterans of the old school were not so far behind the work of the present day, for they were skillful strategists in the position. But the old pitchers of the period in question literally *pitched* the ball to the bat, they not being allowed the advantage of throwing the ball as our modern pitchers are, the term "pitcher," as applied to the occupant of the "box" in our professional teams of to-day, being a misnomer. This curving of the ball in the horizontal line of its delivery from the hand of the pitcher to the catcher behind the batsman is the great feature of the modern art of pitching. It is not many years ago when the curving of the ball in question was regarded as a physical impossibility; and even now some people question its being done. For instance, the editor of the Grand Rapids *World* recently wrote as follows on the subject: "The editor of this paper came near getting roundly abused by a leading lawyer of this city a few days ago, because he ventured to dispute the correctness of the 'curved ball' theory from a scientific standpoint. The baseball enthusiasts claim for Getzein that he is able to so pitch a ball that it will describe the arc of a circle on a horizontal plane before reaching the catcher, and that therein lies the secret of his marvelous pitching, which has done so much to secure victory to the Detroit Club. Scientifically, this theory is utterly absurd. The forces that act upon a ball pitched by Getzein are not different from those which operate upon a projectile thrown from any other source, and the results must be the same, and governed by the same laws. The curves are in the imagination of Getzein's admirers. When the ball leaves his hand it is beyond his control, and it moves forward from the impulse last given it as it leaves his hand. It is then controlled by the force of propulsion, the resistance of the atmosphere, and gravitation. The tendency of the first is to urge it forward in a straight line, and it so moves until the force of gravitation becomes greater than the force of propulsion, and then it begins to descend. The resistance of the air simply retards its motion or may change its direction; but this change of direction is entirely beyond the pitcher's control ordinarily. Getzein's antic and deceptive motions may deceive the batter, so that he is unable to discover the exact course of the ball in time to strike it, but he cannot throw a ball so as to make a curve on a horizontal plane. We are willing to rest the decision of the case with the editor of the SCIENTIFIC AMERICAN, and abide by his decision."

Unfortunately for the statement made by the *World* editor, viz., that "scientifically the theory is absurd," the theory in question is as simple in its rules as it is easy of demonstration practically. It is as follows: The ball, in its horizontal flight through the air from the hand of the thrower—technically known as the pitcher—is retarded in its forward motion by the resistance of the air, which not only exerts a pressure on the face of the ball, but also a resisting force on its sides by friction. Now, if the ball is simply thrown forward without any special bias being given it, the friction of the air is equal on each side of it; but if it be made to rotate on its own axis from right to left or left to right, the conditions are at once materially changed, inasmuch as in the latter case one side of the ball's surface is made to move forward through the air with twice the rapidity of the other side, and to the extent of this increased lateral friction is the ball retarded in its progress on the side on which the increased friction bears. The result of this changed relation is naturally a curve in the line of its delivery in the direction of the side on which its progress has been retarded. This is the simple philosophy of the curve of modern baseball pitching. The application of the theory in practice is to learn to give the necessary bias or rotary motion to the right or left—in order to produce the "in curve" or the "out curve." For instance, the appended diagrams illustrate the lines of direction of a curved ball, the straight arrow (Cut A) indicating the forward direction of the ball, and the bent arrow that of the rotary movement of the ball on its own axis. The bias to the right or the left is imparted by a quick motion of the wrist, the ball being clasped by the fingers in such a way as to give it the required twist.

If the ball (or strictly its center of gravity) is moving forward (let us say at the rate of 100 feet per second), and at the same time it is revolving so that points on its equator are traveling around its center at an equal rate, it is evident that D is traveling *backward* as fast as the ball, as a whole, moves forward; while I is moving forward at its own rate *plus* that of the center—that is, twice as fast as E. As the friction of the air increases with the velocity of the moving object, it must be greatest at I and least at D, being really zero at D under the conditions given. The I side of the ball is therefore retarded more than the center or any other part, while the D side suffers no retardation. The result must be a curve toward the retarded side. When the rotation is on a nearly vertical axis, this effect will be at its maximum, and, according to the direction of its "twist," the ball will curve to the right or to the left—"*in*" or "*out*."

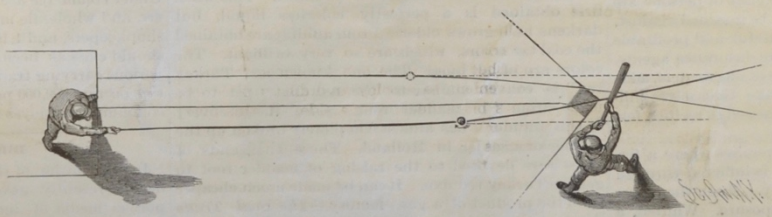


CUT B.—DIAGRAM OF THE METHOD OF GRASPING THE BALL IN DELIVERY.

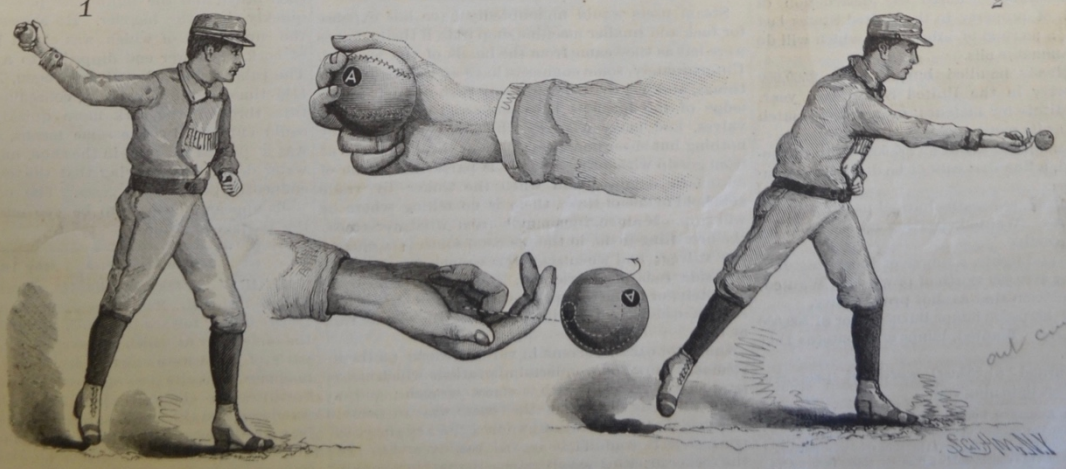
It is almost impossible to fully illustrate the action of the wrist and fingers in imparting the bias to the ball which produces the curves in question, but a curve pitcher gives me the appended illustration of his method of holding the ball when he first takes his position to throw, and when the ball leaves his hand.

He says that in order to produce the out curve, you secure the ball in the hand by pressing it firmly between the first two fingers and the thumb, with the third and little fingers closed in the palm of the hand. In delivering the ball to the batsman, throw the arm forward midway between the shoulder and waist, and at the moment of releasing the ball turn or twist the hand quickly to the left.

The cuts above show how the ball is held just before its delivery, and also its position as it leaves the hand. (Cut B.) In producing the in curve, the pitcher should grasp the ball securely with all the fingers, and with the thumb pressed firmly against the opposite side. Throw the ball at a height equal to the



CUT D.—DIAGRAM OF THE LINES OF IN CURVE AND OUT CURVE BALLS.



CUT C.—DIAGRAM OF THE METHOD OF GIVING THE ROTARY MOTION TO THE BALL.

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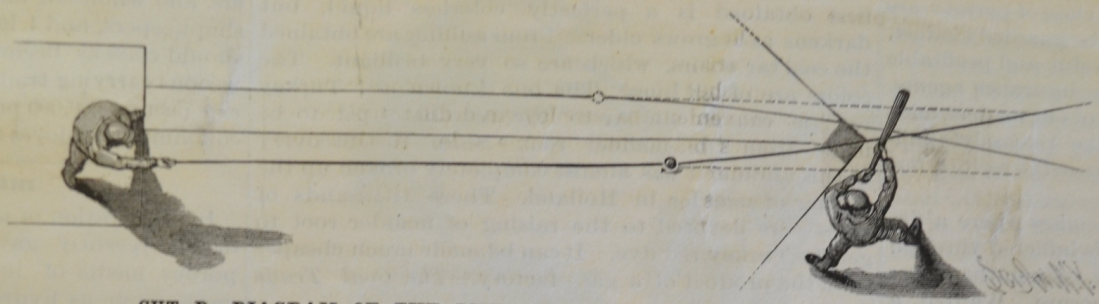

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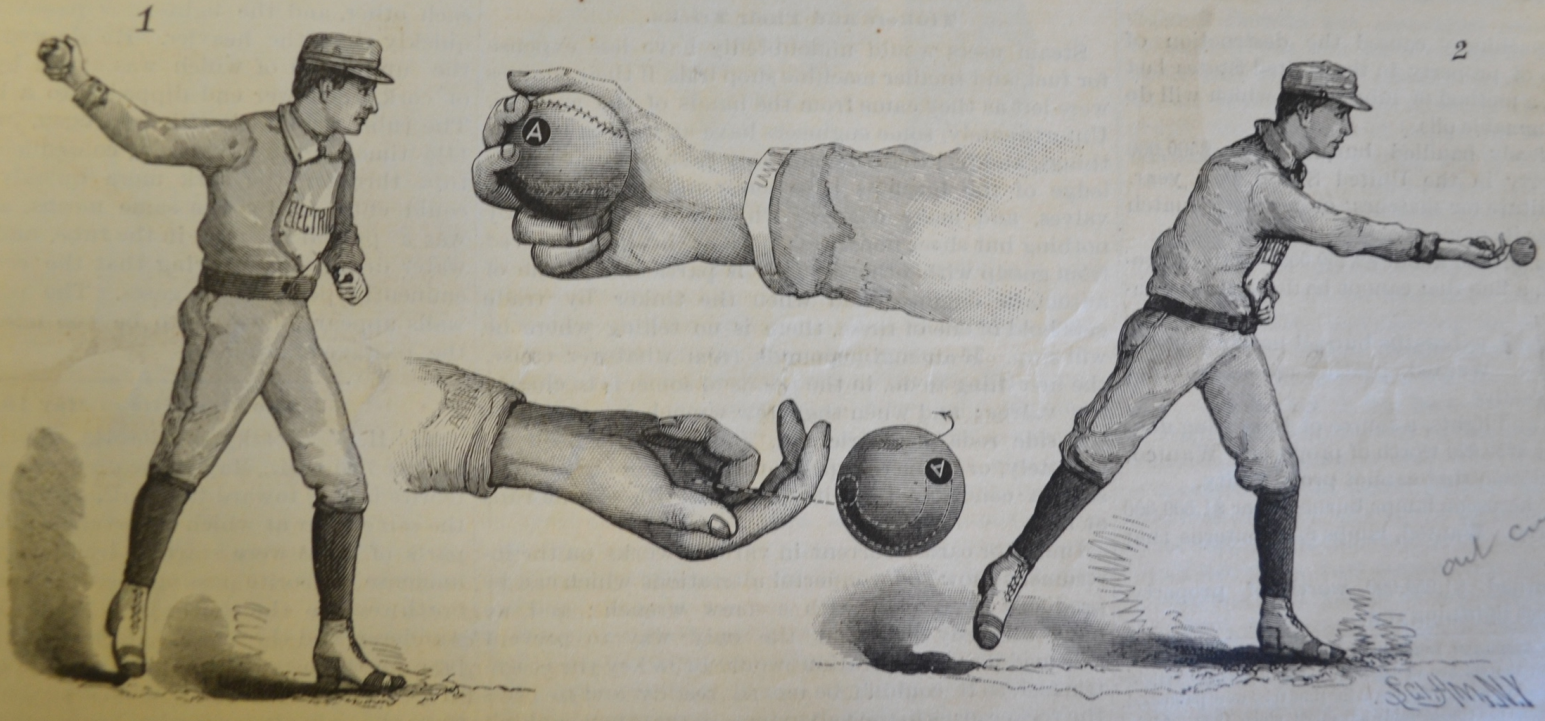

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