



FLIGHT OF THE GOLF BALL

Double Motion is Imparted by Every Stroke of the Club.

Interesting Data Regarding the Value of Long Driving and Studied Strokes.

THE FLIGHT of a golf ball and its behavior in the air after the player has delivered his shrewdest blow presents elements of attraction to all classes of players. No golfer, however skillful or however experienced, can quite get rid of the feeling that though it may be exhilarating to win a hole by a difficult and bold approach shot or a brilliant piece of tricky putting, it is the tee shot at each succeeding hole which lingers longest amid the lavender of the memory, and is recounted with the greatest zest in a subsequent narrative of the varying fortunes of the match.

Every golfer has his own particular method of striking the ball, which, in its subsequent flight through the air, curves to right or left "docks," or keeps straight in its line of initial trajectory according to the player's stance, the velocity of his swing, and the absolutely true horizontal impact of the club. Yet few players theorize about the why and the wherefore of the toed or slice ball, or while the truly hit

ball keeps a straight line and soars in graceful parabola until it drops to the ground. All that they are content to know is that the ball which curves to the right or left has been badly as well as unscientifically struck, and the resolve is made either to correct the stance or to emphasize the follow through of the swing when the next teeing ground is reached.

The majority of golfers are careless of the fact that the golf ball in its flight through the air has had imparted to it a double motion—one progressive, the other rotary. That this is so is nevertheless the fact, and it is one of the charms of the game that it is so inexpressibly full of variety in many of its scientific problems as well as in rich enjoyment of its changing playing aspects. The flight of the golf ball has been frequently studied experimentally, and two of the latest investigators who add their little stone to the growing cairn of our scientific knowledge are F. Broad-

bent and H. Smith in an interesting article in this month's *Strand Magazine*. The illustrations in the article show the ingenuity with which the experimentalists have attained their object of proving the main point of their paper, which is that every ball in its flight through the air has had an underspinning motion imparted to it by the stroke of the player. That fact is not, of course, scientifically new, for it was revealed to a somewhat incredulous golfing world by the late Professor Tait more than a dozen years ago. But what is new is the ingenious method which the investigators adopted to show by means of snapshot photography the behavior of the ball and the clubhead at the moment of impact.

Beyond demonstrating to the eye of the observer that the ball, when struck from the tee, acquires underspin, the new

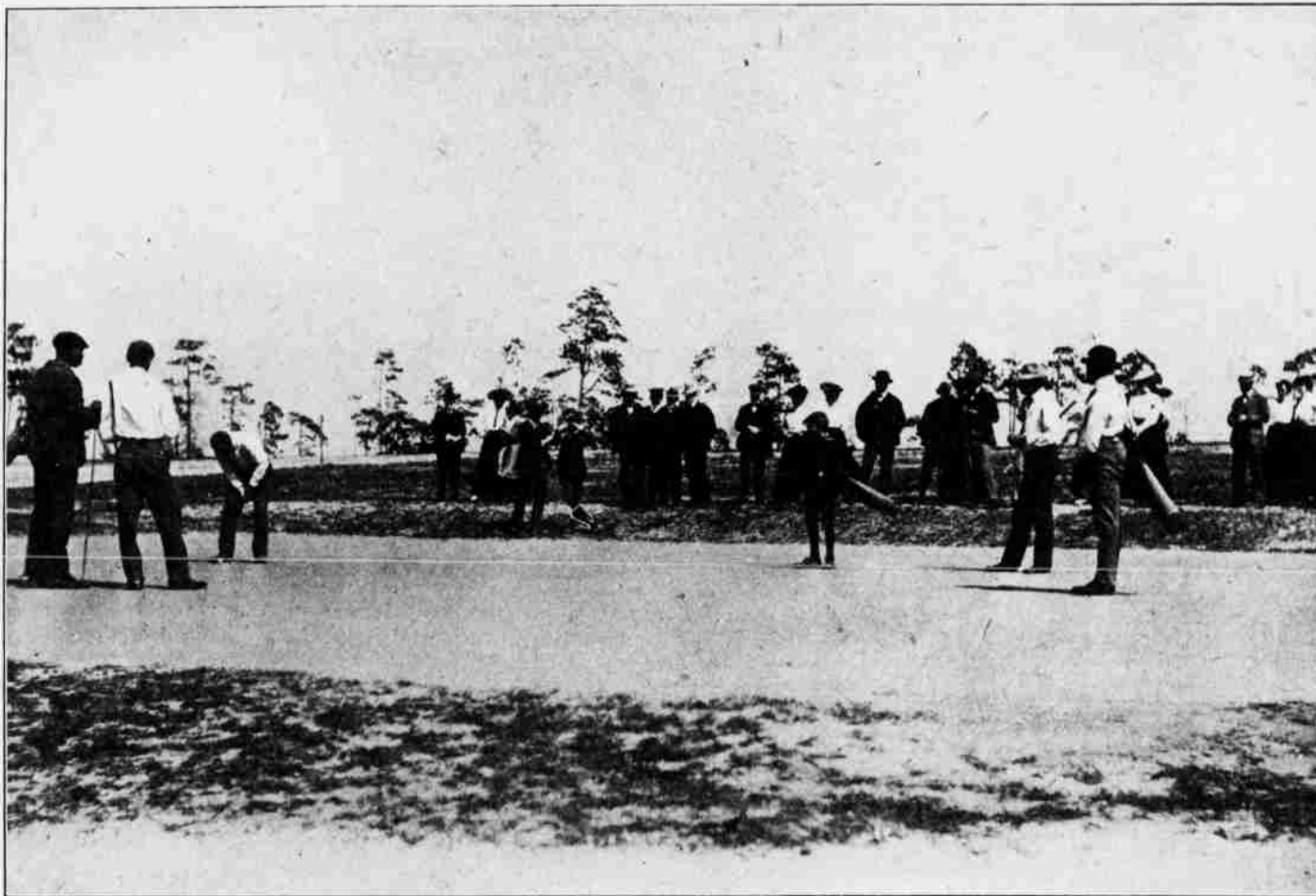
head driven by a twenty-eight pound weight and a pulley, the ball did not leave the club at a greater speed than from sixty to eighty feet per second.

It has been proved, however, in rigid mathematical formulae by Professor Tait that even medium drivers among the ranks of golfers get a speed of nearly 250 feet per second, like Braid or Vardon. The initial speed is as high as five hundred feet per second. Few players realize, therefore, the tremendous expenditure of muscular force needed to obtain a carrying ball of one hundred and forty or one hundred and fifty yards, even when the air is perfectly calm. But if, in addition to the very slight curvature of flight which even the most accurate strikers unconsciously impart to the ball, there is added the constant resistance of the air and the disturbing breezes which the ball has to overcome

sented the theory of Professor Tait that every really fine golfer imparted rotation to his ball when he drove it off the tee.

There is one fact connected with the theory of underspin which seems to be conclusive against the contention of the old school of players, who maintain that long driving was just as much a feature of contemporary play with the feather ball as it is to-day with the gutta or the American ball. The feather ball was smooth in its outward surface, and experienced gained through the efforts of generations of golfers proves that a smooth ball has much less underspin than one that is grooved or nicked. The roughness of the golf ball is essential to a long carry and a steady flight in the air. This was demonstrated when the first gutta ball was experimented with in 1846 at Musselburgh. That ball

was made smooth and without nicking, and when driven by professionals and amateurs experimentally it was banned because of its invincible tendency to "dock." The curious fact was revealed later, however, when the ball was discarded as a failure, and handed over to the caddies, that the more its surface was cut with cleeks and irons the better it flew; and out of that hint came first of all the hand-hammered ball and then the nicking machine mold. The nicking must be judiciously done, for a shallow-nicked ball "docks," and has very little carrying capacity. Therefore, well nicked balls should be selected. Another useful hint which the golfer should



A LARGE GALLERY FOLLOWED THE MATCHES THROUGHOUT THE WEEK.

investigators do not add much to the scientific knowledge already at the golfer's disposal as to the flight of the golf ball. The "Unwritten Chapter on Golf," upon which the late Professor Tait was wont to comment, has yet to be written, though it may be acknowledged that progress is being made in that direction. If, however, we are to get much beyond the state of knowledge in which Newton left the subject 237 years ago, when he noted the curved line described by a tennis ball after being struck by an oblique racket, the experiments on the flight of the golf ball must be carried out in the patient spirit of Professor Tait—on the links, amid everyday players of all grades of driving excellence. Mr. Broadbent and Mr. Smith carried out their experiments in a lofty room, where the air was, of course, still and undisturbed. They invented a piece of mechanism which might be described as a "ballistic driver," to propel the ball off the tee; but even with the terrific swish of a club

in its path, the wonder really is that the general standard of tee shots is so high as it undoubtedly is in these days. It is the presence of these unknown factors in the air, and the difficulty of gauging their influence, that has hitherto made the task of observers and experimentalists such a difficult one. Nothing puzzled Professor Tait more than the singularly inconsistent results which he obtained in his efforts to determine the resistance which the air offered to the golf ball.

It may be accepted as a well established scientific fact that the movement of the ball known as underspin is the very life of every creditable tee shot. Without it there would be no long carries and no really fine drives, and to get golfers in these days to accept the fact almost without question shows very strikingly how great a length we have advanced since the early days when experiments were made, and when the prominent golfers of St. Andrews re-

embodied in his golfing creed if he wishes to prevent curvature in the flight of his ball is to take up a square position at the tee, thereby securing by the horizontal impact of his club more uniformly straight shots.

MRS. LEACH ENTERTAINS.

Picnic in Observance of Her Daughter's Birthday.

Mrs. James E. Leach of Brookline, who is spending the spring months at The Ivy cottage, celebrated the ninth birthday of her little daughter, Miss Elizabeth, by a delightful afternoon picnic in the pine grove last week. There were all sorts of merry games, potato-races and sports, after which a dainty lunch was served and a birthday cake bearing nine candles, cut.

The guests included: Miss Elizabeth Lawrie, Miss Marion Sherrard, Miss Julia Lancaster, Master Willie Ketcham, Master Arthur Ketcham, Master Glenwood Sherrard, Miss Caroline Colby, Miss Rea, Miss Elizabeth Macfarlane and Mr. Richard Hale, Boston, and Mr. Andrew H. Lane.