

UNDERSPIN THE ESSENTIAL

By R. STANLEY WEIR

LET us go with some friend, who is able to strike clean balls in proper golfing style, to some less frequented part of the fairway and there conduct some experiments on the flight of golf balls. Let us ask our friend to chip and pitch balls with various degrees of loft at short distances of, say, ten to thirty yards, while we stand as near as possible to where they fall to earth, sharply observing their action before and after they touch the ground. We shall discover, if we have not noted it before, that every well-struck ball rotates or spins in the air upon a horizontal axis—*backward* as the player sees them and *upward* as we shall see them if we are stationed beyond the pitching point. The balls are propelled forward but they do so with underspin.

Quite a curious feature is this combination of forward motion with backward spinning; and yet it must be familiar to everyone who recalls that he threw stones farthest in his boyhood, by giving them underspin with his fingers. The average golfer, however, imbibing his theoretical notions from current talk, not always scientific in its terms, has the idea that underspin is a special feature of certain shots that are in a class by themselves and that it can only be achieved by special art or artifice. The truth is that, with the exception of the putt which is always rolled, all well-executed shots in golf (and a good many bad ones), no matter what the length of their trajectories or the clubs employed, possess this essential feature of underspin. In fact it is impossible, with the exception noted, to deliver legitimate golf-strokes without it. Watching our balls, as our friend pitches them, we observe that, the moment they fall to the ground, the backward spin is arrested and, in fact, reversed; the balls now bound or ricochet forward or sideways, more or less, until their momentum is exhausted. Some of the balls, after alighting, proceed but a short way, falling, as we say, dead; others again, propelled at less loft, have greater running powers after touching earth; this running often in-

cludes a number of gradually lessening rebounds concluding with a longer or shorter roll.

The well-known topped ball, that scuttles ignominiously and hastily along the turf till it buries itself, ashamed, in the nearest bunker, has either forward-spin or merely rolls along the ground. The ball with underspin seeks the air; the ball with forward-spin seeks the earth. With fast balls, I should have said, it is not possible for the eye to detect initial underspin, but, with slow, pitched ones, the eye can note it distinctly. The characteristic, clean, graceful shot that describes a curve of beauty, falling to the ground with pride as if conscious of a meritorious performance is all of underspin. The fozzled, topped and foundered shot lacks underspin.

Certainly the casual golfer hears or reads a good deal about top-spin as a beneficent agency; but this must be understood as a mere *façon de parler*. Edward Ray, for example, in his excellent book *Inland Golf* writes of producing "overspin" by turning over the right wrist slightly as the ball is struck. Now the Worthy Edward does not produce overspin in the manner he describes—at least not in the main trajectory of the shot. What he produces at first is relatively rapid underspin which gives him aerial flight for his ball. When the ball touches the ground the rapid underspin is followed by correspondingly rapid impetus



A. BARTON HEPBURN AND RECORDER
WEIR OF MONTREAL

From a photograph taken at Manchester, Vt., during this year's Amateur Championship

which results in a rebounding or running the reverse of falling dead. In the shot called "the pitch and run" the pitch is of underspin and the run of forward-spin—or mere rolling as in the putt.

It follows that the difference between a much lofted mashie stroke (supposed to have great underspin) and a running-up stroke, such as Edward Ray writes about, is one of degree alone. Both must have initial underspin. But the fact that the running-up stroke has great scuttling powers deceives the un-instructed player. In fact there is no such thing in practical golf as aerial overspin. Drives, brassie-shots, iron-strokes, pitches—all demand underspin—

otherwise they are foozled. The variation in golf-strokes is a variation in underspin; not a change from one kind of spin to another.

The foregoing leads us to refer to one fallacy about underspin which, as it is very common, should be noticed here. It is often said that "the more backspin or underspin the deader the fall and the less the run." Here, for example, is a mashie-pitch which falls a few feet from the hole; runs those few feet sluggishly and then lies dead. What a tremendous amount of underspin, we say! Now, as it is foolish and perhaps useless to quarrel with fashions of speech, we may as well agree at once with such a comment; but the scientific fact is that our well-pitched mashie-shot had very little, because relatively slow, underspin. It was probably slow enough to be observed by the ordinary eye. It is your fiery drive, your low-skimming, far-running cleek-shot, your shot that greedily eats up distance which has the maximum rapidity of underspin. The more steam the shot has the more rapid the underspin—so may the law be stated.

If these considerations are correct, and I shall cite authority in a moment, they should modify much current misconception. Few golfers, I imagine, are in the habit of associating underspin with their ordinary full-shots; few reflect that the vice of a topped and smothered drive is the complete absence of underspin and the substitution of forward-spin. Only when they come to talk, perhaps, about the push-shot which pulls up so shortly or the mashie that falls obediently dead do they think more or less vaguely of underspin as a new factor that is absent from their other performances.

The large proportion of players, therefore, who entertain the notion that their tee-shots and long shots, generally, are all compact of forward-spin and that underspin is a *retarding* agency are quite in error. Underspin, in point of fact, is the life and soul both of the careering drive and the deadly approach and of every good stroke until we are holing out. It is by no means a retarding agency of necessity.

Now it may not be of much practical utility thus to recognize what it is that gives charm to the shorter or longer swallow-flights of the golf-ball; but it certainly adds not a little to the fascination of play. Nay, I am inclined to hazard the assertion that in underspin we discover the real soul of golf. The foozled shot has no underspin; it has, therefore, none of the afflatus of golf. But when we impart underspin the ball soars a thing of beauty and its perfection is the measure of its appropriate underspin.

So far, although I have suggested tests of the truth of my theorems, I fear I have been rather dogmatic in my statements and it is time to seek shelter under authority greater than I can claim. No more eminent authority can I seek than Professor P. G. Tait (father of that great golfer the regretted Lieutenant Tait), who, nearly twenty years ago, lectured on the flight

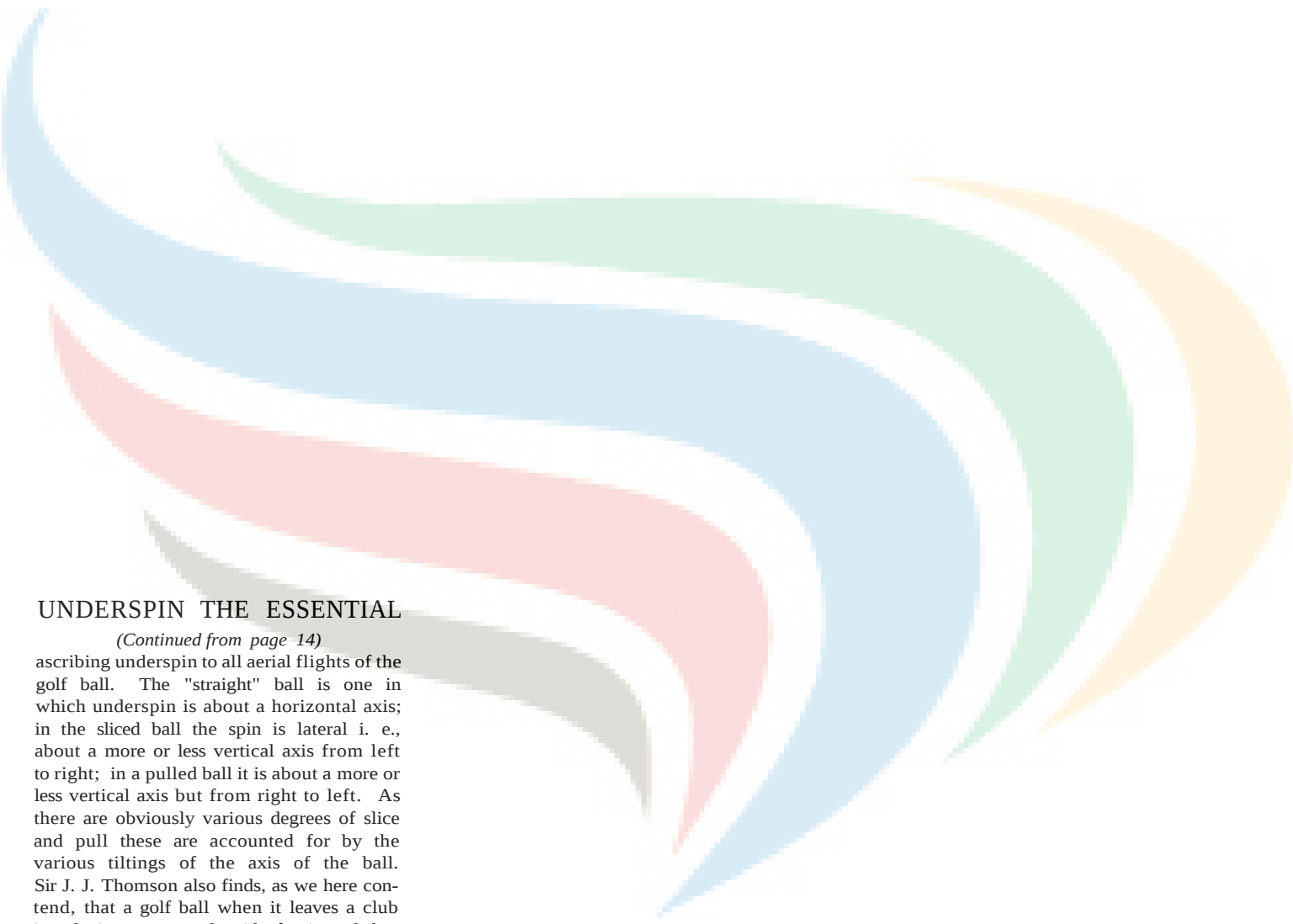
of golf balls before his classes in Edinburgh University, and various learned societies. Professor Tait also contributed an article to the *Badminton Magazine* (March, 1896), which has frequently been reprinted. It is rather technical in form for the ordinary lay reader but its main contention is that "the long carry *essentially involves underspin*." Prior to this, underspin was regarded as a feature of certain lofted shots only; showing that the heresy about forward aerial spin to have been quite ancient. As early as 1893, in *Golf* for August twenty-fifth, Professor Tait had published the first of a series of articles establishing the same law of physics and, incidentally, squelching an anonymous correspondent "Rifleman" who "felt sure" or "quite believed" that a well-driven ball rotated with an overspin.

Professor Tait explains that he was indebted to W. Wilson, a St. Andrews maker of cleek-heads, for the suggestion of an experiment which proved, in a simple manner, the existence of underspin in well-executed strokes; and also provided a measure of the rate of spin. "All that is required," says the Professor, "is to attach firmly to the ball a long, loose, untwisted tape; fix its other end; drive the ball into a mass of clay at a short, measured distance; and, taking it out, count the number of turns required to untwist the tape." The twisted tape proved conclusively, of course, the existence of underspin.

Professor Tait, we must in candor admit, remarks that Mr. Macfie, "one of the players who drove balls into the clay, was able to make cleek drives absolutely free from spin by causing the club-head to move at impact in a direction perpendicular to the face, there being then no trace of twist." We are inclined to think the driving of a ball free from spin as a very unusual performance and difficult to perform at will. Yet Mr. Macfie, who was a noted player in his day, seems to have done it. Mr. A. E. Crawley in "The Book of the Ball" remarks: "Obviously it is impossible in ninety-nine cases out of a hundred to give a perfectly central blow. A lawn tennis ball hit with almost perfect squareness is seen to turn at least once in its flight." Elsewhere Professor Tait has remarked, and we think with truth, that "the most cursory observation shows that a ball is hardly ever sent on its course without some spin." At all events we may take it as firmly established, not only that underspin is an essential feature of all well executed strokes in golf excepting the putt, but that a ball traveling without spin is a practically negligible phenomenon.

Those interested in the scientific exposition of spin and swerve may follow up Professor Tait's articles by a perusal of "The Dynamics of a Golf Ball" by Sir J. J. Thomson, Cavendish Professor, Cambridge University, etc., reported in *Nature* December 22, 1910.

This learned lecturer follows Professor Tait in
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ascribing underspin to all aerial flights of the golf ball. The "straight" ball is one in which underspin is about a horizontal axis; in the sliced ball the spin is lateral i. e., about a more or less vertical axis from left to right; in a pulled ball it is about a more or less vertical axis but from right to left. As there are obviously various degrees of slice and pull these are accounted for by the various tiltings of the axis of the ball. Sir J. J. Thomson also finds, as we here contend, that a golf ball when it leaves a club is only in rare cases devoid of spin and that underspin is the essential of true flight.

Reverting to our statement that the longer the carry the more rapid the underspin and the greater the loft the less rapid although the more perceptible the underspin, we would warn the reader to distinguish between a loft caused by underspin and a loft caused by a ball being hit very much under. Many mashies, much lofted, are employed in this latter method, much turf being taken by the way. There is no doubt, a modicum of underspin in these shots; but the loft is caused by extreme under propulsion and not wholly by backspin although the latter is doubtless present as a factor.