

rather than in terms of scientific validity. This study is aimed at proving that one simple yet scientifically valid instruction is sufficient to improve ball flight in every case.

The one simple instruction of widening the right arm backswing arc resulted in distance improvement in almost every case. There was an average distance improvement of 8.5 yards for swings of Type A and 2.8 yards for swings of Type B. This is a significant improvement for the average golfer because 5 - 10 yards represent a half to whole increase in the number of iron to be used. No distance improvement took place for subjects 6 and 7 of Swing Type B because they were still unable to keep the right shoulder and arm from withdrawing too early from the target line.

Observation made during the study showed that the right arm moving away from the right side of the body, forced the left arm to move too. This forced the entire left side (shoulder, hip, knee, ankle) to move, in a synchronised manner and about the central spine, producing correct pivot. This observation is substantiated by Leadbetter's (1990) definition of pivot which takes place when (a) the chest turns until it is over the right leg (b) the left shoulder is under the chin and turned well behind a vertical line drawn up from the left hip. A good pivot and weight-shift during the backswing should allow the left hip to pull the clubhead through impact more efficiently. This was found to be so, especially with subjects who showed marked improvement.

Distance improvement was impressive in spite of the short duration of the study. However, accuracy also improved marginally in 13/17 cases. In 4/17 cases (9 and 10 of Type A and 1 and 2 of Type B) accuracy reduced slightly. This reduction of approximately one yard in accuracy was not a particular sacrifice for the average golfer considering the size of most greens and the distance improvement made. Accuracy improvement took place because the subject was required to keep the clubhead low to the ground and square to the target line longer during takeaway. This bettered chances of the Ball Flight Laws (7) governing direction (club face angle, club path and centredness) being obeyed.

Although this study did not measure trajectory, it was seen to improve dramatically because the recommended backswing allowed a lower angle of attack in the through swing, as desired by the Ball Flight Laws (7).

There was an increase in mean clearance angle of  $9.0^\circ$  for swings of Type A and  $6.4^\circ$  for swings of Type B, with Type A swings continuing to remain wide well past this point. Maximum distance improvement took place with swings of Type A, because these swings already incorporate more elements of the recommended procedure, that is, arms starting takeaway and swing on plane. Type B did not show commensurate distance improvement because a too early shoulder rotation prevented proper weight-shift and an on-plane swing. Although many golf teachers such as Hebron (1984) require a shoulder turn to start the backswing, this study showed that shoulder turn should be the effect and not the cause of a correct backswing.

When the two different parameters clearance angle and distance, were correlated it was found that cases 6, 7, 8, 9 and 10 of swing Type A and 2, 3 and 4 of swing Type B represent the median, with an average correlation of 36.163. The first five cases of swing Type A (1, 2, 3, 4 and 5) however, are in a league of their own with a correlation greater