Letters to the editor

Dear Sir:

The article in the April issue of GOLFDOM by Roger Ganem entitled "The Importance of the Shaft" is very informative. The basic premise "to get the clubhead in the proper hitting position precisely at the instant of impact . . ." is the fundamental criteria for a good match between shaft and clubhead for a particular golfer. However, the article also suggests that aluminum shafts are not as fast as steel, which is not as well considered as the rest of the article.

The optimum shaft provides the greatest momentum at impact in addition to being in the proper position. Certainly the shaft should be straight at impact, which means the clubhead is at its maximum speed. But to do this, the spring-like nature of the shaft which causes the clubhead to accelerate to a peak velocity, must be timed to the individual's swing speed rather than "as fast as possible." The time required for a shaft and clubhead to recover from a position of greatest bend to the straight position should relate to the time required by the golfer in accelerating the club through the downswing to impact with the ball. It is a safe bet that many golfers do not pick the proper head weight and shaft flex to match their particular swing pattern without sound professional help. This problem is amplified with the lighter weight shaft which changes the apparent stiffness, since the club weight is reduced. Consequently, an aluminum shafted club may require two or more additional points of swingweight added to the clubhead to develop the best results.

The statement that "Aluminum . . . does not return the club to its usual position as fast" is simply not accurate. It is possible to design an aluminum shaft to be dynamically interchangeable with any steel shaft

Continued on page 18

Letters to the editor

Continued from page 16

design. Furthermore, the aluminum shaft can be produced with truly consistent flexibility over the length of the taper.

The statement is made that "To be good, a golf shaft must return as fast as possible." If this were true, every golfer would use an extra-stiff shaft. The time of recovery is referred to as a coefficient of restitution. This term infers that, as a coefficient, it must be related as a ratio to some standard value. To the best of my knowledge, there is not a time period of recovery and amount of deflection for a golf shaft that is accepted as a standard value. Finally, when the shaft is mounted in a club, the club should oscillate at the designed rate and a faster (or stiffer) shaft will require greater weight in the clubhead to maintain the desired oscillating frequency of the clubhead. The rate of recovery of a shaft is directly related to its natural oscillating frequency and this value is easily measured on a vibration testing machine. Some day perhaps, shafts or preferably golf clubs will be rated by resonant oscillating frequency and weight, which would be more appropriate in fitting a golfer. Our tests indicate that the aluminum is not slower than steel, and it can be produced to a particular value desired by the club designer.

The fundamental advantage of aluminum is that the lighter weight and thicker wall can be used to much greater advantage in designing separately for longitudinal flex characteristics, light weight, and for the torsional rigidity desired. By choosing aluminum, the designer avoids a major limitation inherent with the thin-walled steel shaft. A thin-walled shaft of any metal will tend to become elliptical during bending. As a shaft ovals in bending, the stiffness diminishes. Consequently, for a given diameter in the handle of a shaft, there is a minimum wall thickness necessary to keep the shaft round and preserve stiffness.

Since the modulus of elasticity and density are nearly identical for stainless and the common steels, stainless steel shafts have the same geometric problem that has limited further weight reduction in steel shafts. The aluminum golf shafts currently available have much thicker walls and do not approach a critical wall-to-diameter ratio, so the club designer has much more freedom in designing lighter weight shafts. He can increase torsional stiffness, for better control, and still maintain a particular longitudinal flex contour. It is true that the thicker walled aluminum shaft soaks up more shock than steel, but this does not have any effect on the performance of the shaft.

We are convinced that there is no material, including stainless steel, better suited to the manufacture of golf shafts than the aluminum alloys properly processed for high strength. The technical information is available to support this conclusion, and the high strength aluminum alloys certainly would be appropriate to fundamental improvements in shaft and club design suggested in Mr. Ganem's article.

Mike Farguson
Easton Aluminum Tube
Van Nuys, California