



# Squirt Continued

How to deal with it.

In the August issue, we reviewed discussions of squirt (divergence of the cue ball when using side spin) in 150 years of billiard writing. Last issue, we looked at the basic physical cause of squirt: the tip's moving to one side causes the cue ball to squirt to the other. This month we'll look at several ways of dealing with squirt.

Is squirt something that has to be dealt with? If your game has not yet progressed to the point where you use side spin to position the cue ball — and most pool players will never reach that level — there's no practical reason for you to worry about it. If you do resort to English when necessary or amusing, you'll need to compensate one way or another. Many players, perhaps most, do all of their compensation unconsciously. I remember standing next to Bob Meucci while he was measuring squirt — he would call it deflection, but we've seen why that's a misnomer — at a trade show, and a top-ten pro player asked, "My cue does that?!" My conclusion is that some can reach championship levels without ever understanding the true geometry and physics happening on the table in front of them.

If you are unwilling to let your subconscious be in charge of this aspect of your game, here are several ways of coping:

The first is to reduce the amount of squirt that your stick has. The idea is that the less the cue ball diverges from the line of the stick, the less compensation you need to make. The Holy Grail here is a squirtless stick, but based on the physical analysis last month, this seems to require a shaft with no weight at all.

Two cue companies have made significant advances towards the ideal. Predator reduces the mass up front by boring a hole down the center of the shaft. This reduces the weight that causes the cue ball to move to the side. Meucci has modified the ferrule

in a way that also has less mass moving to the side during impact. Traditional snooker and carom cues have less squirt than typical pool cues because of smaller shaft diameters at the tip, and shorter, lighter ferrules, which both reduce the front mass. If you have a chance, try spinning your ball with a 12mm or smaller diameter shaft fitted with a ferrule no more than half an inch long.

If your pool cue has a typical amount of squirt, there is a compensation technique that will get you close on many shots. Imagine that you want to drive the cue ball

stick over to line L, stroke and shoot along that line, and the cue ball would travel along your original line straight to the right. If you wanted right English instead, you would first aim as before and then pivot to line R and shoot.

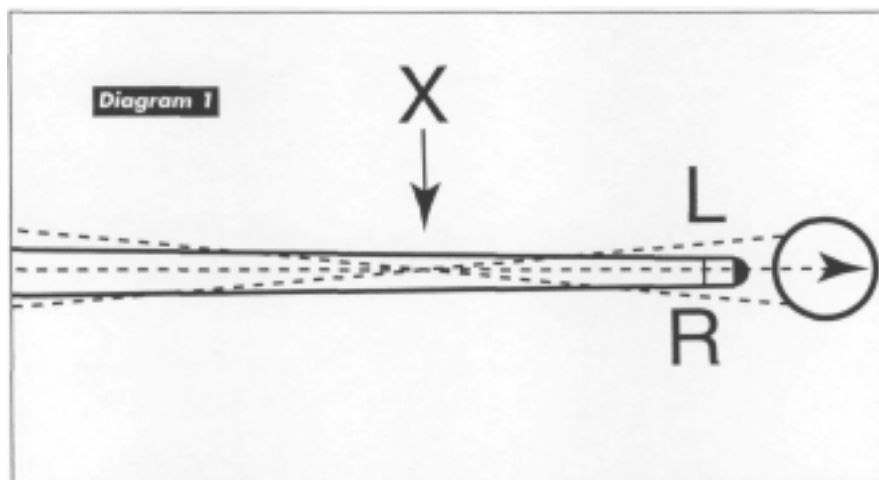
This method of compensation seems to be very old. Diagram 2 is a detail of the page shown in August from Edwin Kentfield's 1839 book. It shows two positions for the cue stick to hit the same target with either left or right English. While Kentfield doesn't stress the possibility of having your bridge hand at the common or pivot point of the two sticks, his diagram clearly suggests it.

In modern discussions, this technique goes by two self-explanatory names: "aim and pivot" and "back-hand English." The standard procedure is to take a few warm-up strokes after you have pivoted over to L or R and then come straight through. This allows you to

check how much side spin you have set up for. A similar technique, which we might call "aim and swoop," has you come over to L or R only on the final forward stroke, so the amount of spin is determined by how much your back hand moves to the side during the final forward motion. This sounds like it should be horribly inconsistent, but some top pros use this or even worse techniques.

How can the aim-and-pivot technique go wrong? First, the pivot point varies from stick to stick. If your stick happens to have a pivot point just at your usual bridge position, the compensation will be exact. If the stick has lots of squirt, you will need a shorter bridge; less squirt will force a longer bridge.

The speed of the shot is also important. As far as has been demonstrated, the squirt angle doesn't change much with the speed of the shot, but the cue-ball swerve will



straight to the right with no spin as shown in Diagram 1 (view from above). The axis of the cue stick passes straight through the center of the cue ball along the line you want the cue ball to take. Now consider where the axis of the cue must be to drive the cue ball along the same path, but with serious left English. The axis will be along something like line L. The stick is shooting the ball off at an angle, but the squirt will bring it back to the same line as for the initial shot. The amount the stick has been angled to the left exactly matches — for this particular hypothetical stick — the angle of squirt back the other way. Of course, for right English, the angling would be just the same but in the other direction.

Now for the delicious insight. The two stick angles — for left and right English — have an intersection or common point marked X. Suppose your bridge hand was at X. You could aim with no spin, pivot the

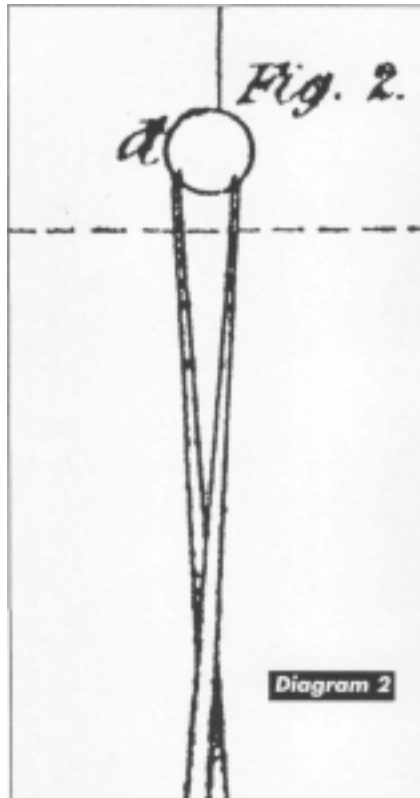
## Bob Jewett

change a lot with the speed — less speed, more swerve. Players sometimes confuse the two effects and think there is more squirt on fast shots. Similar confusion occurs on new, slippery cloth, which seems to have more squirt but really has less swerve than standard or worn cloth.

Does aim-and-pivot still work if you use less English? It seems to. If you pivot only half as far over as L or R but with the same bridge position, you get half as much spin and about half as much squirt. This may depend slightly on the shape of the tip. The result is that if your bridge hand is at the pivot point, the cue ball can go only along one line no matter how much left or right English you use.

This last point can be important for the selection of a break stick. If you choose one with a pivot length equal to your break bridge length, the accuracy of your hit on the rack will not be ruined by your inability to hit the cue ball in the middle at break speed.

Pivot length — the distance between your bridge hand and the cue ball for perfect squirt compensation — has quite a large range depending on how the shaft of the stick is made. Reported values range from 8 to 50 inches. You clearly must be careful in your selection if you want to use the aim-



and-pivot method. On the other hand, if you're like me and want a cue with low squirt to reduce the needed compensation, and the chance for error to creep in while applying that compensation, you'll want to look for a cue with a longer pivot length.

Measuring pivot lengths is easy if not perfectly accurate — try different bridge lengths until you find one that gives good squirt compensation. As a target, try to hit an object ball full that is only a diamond or so from the cue ball; that will give swerve less chance to **corrupt** your results. Also, be sure to shoot fairly firmly, for the same reason.

Earlier in this series, I asked if there was any shot that required squirt. Rick Malm emailed to point out that if an alley formed by nearby object balls restricted your cueing to only one level line of approach to the cue ball, squirt might be required to make the shot. I do not recommend buying a variable-squirt shaft to be ready for this improbability. Rick also pointed out that on draw shots, a high-squirt cue stick should shoot the cue ball more parallel to the table, since the "vertical squirt" would tend to cancel stick elevation. This might help a little, but I think that all normal sticks don't have nearly enough squirt to get a perfectly flat shot.