

The Cue Ball

There are a lot of articles on the internet on how to shoot, how to stroke, how to use English. However, there are virtually no articles that explain what happens when you stroke the cue ball. We hear about deflection, throw, masse, but no one actually tells us why this works. If you are going to perfect your stroke and become a great shot maker you have to understand what happens when you stroke the cue ball.

The first thing you need to understand is that there are only 3 things that affect the cue ball. The Angle you shoot the ball at, the Speed you shoot the ball, and the Spin you use. The PBIA acronym for that is A.S.S. That makes it easy to remember. Let's look at each of these separately.

Angle. Ninety percent of our strokes require a level cue. If we hit center ball with a level cue the cue ball will slide for a short distance and then transition to forward spin due to friction in the cloth. The harder we hit the cue, the farther the slide. Now, when I say a level cue, what I mean is that the cue, at impact, is about 1 inch above the rail. The biggest problem I see in most people's stroke is that they tend to raise the cue 3 to 8 inches above the rail. When elevated, if you hit that same center ball spot we referenced with the level cue shot you will actually be putting backspin on the ball. Then, if you want to go 3 tips of backspin you miss cue. On the other side of that, if you try to put a tip of forward spin on the ball, say like on a break, the cue ball hits the rack and flies off the table. What just happened?

Think about this, when you elevate your stick, you are effectively changing where center ball is, in reference to the cue. The problem with this is that we are increasing the variables in the stroke. To maintain a good consistent stroke we want as few variables as possible. If you are elevated and hit center ball, (in reference to the cue), you are driving that cue ball into the slate of the table. What happens? The cue ball jumps. Yeah, you are actually jumping the ball. When you break, which is usually stroked harder, the ball has a tendency to bounce on the way to the rack. If you hit the rack on a bounce the momentum will cause the cue ball to leave the table. The second problem is that if the ball is off the table the cloth isn't slowing the cue at all so it won't reverse its spin, making it harder to control. That's bad news. Third, if by chance you hit the cue ball slightly to the left or right while elevated, English. Not only will the ball jump but it will physically curve on the table, or masse.

A level cue is the only way to minimize the variables. When the shot calls for a masse or a jump, great, use what you need but don't complicate it by adding to many variables.

Speed. Funny thing about speed, when you perfect your stroke you don't need to stroke as hard. I rarely stroke at more than 50% power. This is huge. Most stroking problems occur when you try to hit hard. Your body starts to move, you drop your elbow, your grip tightens and as you tense up you pull the stick toward your body. One less thing to worry about when you can hit the ball in a comfortable speed range! As I mentioned previously, if you hit center ball with a level cue the ball will slide some distance before it starts to roll forward. Take a stripe and line it up so the number is your center ball spot. Line up the stripe parallel to the table. Use a medium stroke and hit center ball. Watch for when

the ball stops sliding and starts rolling forward. Make a note of that spot. Do the same thing but with a little harder stroke. How much further does it go before it starts rolling?

So let's take this a step further. Place a ball at the center of the table. Take that stripe as mentioned above and place it at the same distance you made note of in the previous example. Line up a straight shot at the object with one tip of draw. Stroke a medium to slow speed shot. What happens to the stripe? It backspins, slides and then starts to roll forward before it hits the object ball. Maybe following the object ball by 3 to 5 inches. Set it up again. Now use 2 tips of backspin. What happens? The stripe backspins, slides and impacts the object ball and stops. Do the same thing with 3 tips of backspin. The stripe will backspin, contact the object ball and return toward the tip of your stick. One speed, 3 different outcomes. Do the same thing with forward spin. What do you see?

As the old drug commercial used to say, "SPEED KILLS". You only have to hit the cue ball hard enough to line up on your next shot.

Let me make a note here. No two tables play the same. New cloth, old cloth, worsted cloth, hard rails, dead rails, etc., etc. Every table is different. So the speed you need to accomplish your shot is different on every table. Every time you play take a few moments to acquaint yourself to the table you are going to play on. Do some lags, bank shots, and some down and backs. Every player has a "natural" speed they are comfortable shooting. Find out what that is on each table you play. For example. Put the cue on the spot. Hit it at the diamond on the far side with a nice natural stroke. It should go down and back and bounce off the near rail. On some tables it might go all the way back to the far rail. A slow table it may only move 1 diamond off the near rail. That's your natural stroke.

Spin. I mentioned before that if you hit the cue ball off center it will spin left or right. This is called English. There are two schools of thought about English. First, only use it when you have to. Second, there is something called cling that happens to balls when they collide. This causes the object ball to get dragged slightly off its original trajectory. This is usually caused by dirty balls. A small amount of spin on every shot helps alleviate that. My **opinion** is that you shouldn't bother with English until you have a consistent stroke and reliably can make most shots. Then introduce English only when you need it. English has gotten more people in trouble because it can be unpredictable if you don't understand everything going on in your stroke. It's just another variable. So let's talk about English and why it's unpredictable. If you line up with a level cue and hit the cue ball from the head spot to the center diamond on the far side of the table here's what happens. First thing is that when you hit off center the cue pushes the cue ball in the opposite direction. This is called deflection. How much? Good question. Best answer. It depends. Manufacturers have changed their construction techniques and now have low deflection shafts and 0 deflection shafts. Also, tips ranging from soft to hard, layered and one piece can affect how much the tip grips the cue ball. Finally, not all cloth is the same, some picks up spin faster than others. Too many variables. Generally, a regular shaft can cause as much as 2 to 3 inches of deflection on a 9 foot table. Lower deflection shafts actually have the same amount of deflection except that the way they are designed causes the cue ball to return toward its regular path. So on a 9 foot table maybe you'll see an inch or less of deflection. Are you seeing the problem? If deflection of a regular cue and a low deflection cue is the same at the cue ball, then somewhere around half way down

that 9 ft. table the low deflection action has to start affecting the travel of the cue ball. Just like everything else, you have to practice with the technology to master it. WPBA professional Jennifer Barretta said it took her months to get used to a low deflection shaft. But that's another story. So for this explanation let's assume everything is middle of the road and get back to hitting the ball off center. If you watch where that cue ball hits the rail you'll see how much deflection you have. The more English you apply, the more deflection you get. So thinking about that, if you are going to hit a rail shot and want to use English to control the cue ball, would you maybe have to adjust your aim a little to compensate for deflection? Hmmm! Maybe.

So what happens when that cue ball hits the rail? It does not come straight back. It spins in the directions of the English applied. If there is a little angle at the rail you might actually pick up some speed.

Next, if you apply left English to the cue ball what happens to the cue ball when you hit the object ball? When the cue ball impacts the object ball it deflects based on the angle. However, the collision allows the spin that was applied to be used and the cue ball will start on its regular trajectory and then start veering off with the spin. Also, left spin on the cue ball will impart right spin on the object ball. The object ball will travel down its normal path but will track off in the direction of the spin. This is called throw.

This is why English can be so hard. Too many variables. The only way to become proficient is to practice and be aware that tables are not the same, sticks are not the same, and balls quite often are not the same.

Masse, Swerve. I'll have to admit. I use swerve quite a bit. Once you get the hang of it, it can get you out of a lot of problems. Masse and Swerve are basically a combination of A.S.S. Elevated cue, off center, set up for draw. Minimum speed. (Slower speed the faster the spin catches on the table). If you have a ball partially blocking your shot you can "bend" a ball around the problem ball and get a good hit on your ball. To do this you have to understand deflection, English, draw and speed. You have to pick a point that you are shooting at and where you want the ball to bend at. This takes practice, practice and more practice.

So now with that is out of the way we can get to cue ball control. Using A.S.S. We talked about backspin and forward spin directly hitting the object ball. What happens when we hit at an angle. There are two rules that come into play here. These are arguably the most important rules in pool because when combined with A.S.S. you will know exactly where the cue ball will go every time. They are the 30 degree rule and the tangent line.

Tangent Line If you hit the cue ball directly into an object and the cue ball stops, that's called a stop shot. You are essentially "sliding" the cue ball all the way to the object ball. All the energy is transferred into the object ball and the cue has no power left. It stops. Now what happens if you hit half an object ball? Only half the energy is transferred and the cue ball retains half of the energy. But here's the kicker. If you hit the cue ball as a stop shot, the cue ball will deflect at 90 degrees off of the projected path of the object ball. For instance, if the object ball was on the foot spot and you hit a stop shot to

make that ball in the corner, the cue ball would travel at 90 degrees from the object balls travel path, or, directly at the other corner. Here's another tip. The percentage of the object ball you hit is directly proportional to the amount of energy transferred into the object ball. For example, a 25% hit will only transfer 25% of the power in the cue ball. A 75% hit on the object ball will transfer 75% of the power of the cue ball. This knowledge is huge!

30 degree rule This rule says that if object ball is rolling on the table with a natural roll, (no spin), with the same set up as above, if you hit the object ball to go in the corner, half ball, your cue ball will deflect by 30 degrees. A quick reference is to make a peace sign with your fingers and lay your index finger on the initial path of the cue ball. Your middle finger will point out the expected travel line of the cue ball. As it turns out, this shot places the cue ball 4 inches short of the corner pocket.

If you apply forward spin to either of these shots your cue ball will go forward of the normal travel line. Backspin will cause the cue ball to move behind the normal travel line.

Knowing the natural travel path of the cue ball is huge. Knowing how to maneuver that line with spin is a game changer.

Conclusion

This article was only intended as a primer. To understand these principles you have to practice and perfect your stroke. I have a video coming that will go a bit deeper into these concepts and make it easier to see what happens on the table. Here are the things we learned.

There are only three things you can do that affects the cue ball...

The **ANGLE** you shoot at the ball.

The **SPEED** you shoot the ball.

The **SPIN** you put on the ball.

Using a level cue in your stroke is the best chance you have to minimize variables.

English is like driving. Just because you know how to drive doesn't mean you have to.

Masse and Swerve are the result of all three of the A.S.S. being used at the same time.

Tangent Line and the 30 degree rule are maybe the most important factors in understanding where the cue ball is going to go. Understanding these fundamentals is a game changer.