David Alciatore, PhD ("Dr. Dave")   ILLUSTRATED PRINCIPLES
**"VEPS GEMS - Part XVI: The Massé Shot"**

Note: Supporting narrated video (NV) demonstrations, high-speed video (HSV) clips, and technical proofs (TP), and all of my past articles, can be accessed and viewed online at billiards.colostate.edu. The reference numbers used in the article help you locate the resources on the website. If you have a slow or inconvenient Internet connection, you might want to view the resources from a CD-ROM or DVD. Details can be found online at: dr-dave-billiards.com.

This is my sixteenth article based on the "*The Video Encyclopedia of Pool Shots (VEPS)*," an instructional DVD series I recently created with past BD columnist and good friend Tom Ross. VEPS contains 750 shot types and principles within 50 main categories and 5 major areas. An outline of the entire VEPS series and video excerpts from each DVD can be viewed online at: *dr-dave-billiards.com/veps*. Last month, we looked at jump shot physics and technique advice, which is covered on the fifth DVD: "VEPS V – Skill and Specialty Shots." This month, we'll focus on massé shot technique and examples, also covered on the last DVD.

A massé shot is one where you hit down on the cue ball (CB) off center to curve the CB's path, usually in dramatic fashion. In the early 1800's, a brilliant physicist and mathematician came up with a remarkably simple way to predict the direction of the CB after curving ceases and natural roll begins. His name was Gustave Coriolis, the same guy who discovered the "Coriolis" Effect that helps explains, for instance, how tornados and hurricanes develop. **Diagram 1** illustrates Coriolis' aiming system. The line of action of the cue results in contact on the CB at point "B." Extending this line down onto the table defines aim point "A" on the cloth. Finally, point "R" is the resting point of the CB on the cloth. Coriolis discovered that the final direction of the CB, after curving, should theoretically be parallel to the line through points "R" and "A." I call this system the "BAR" method because contact point "B" on the ball results in aim point "A" on the cloth, and the line from resting point "R" predicts the final CB direction.

As demonstrated in **NV B.88**, the system isn't usually perfect in the "real world." With typical conditions, the curve will usually come up a little short of the predicted direction. Therefore, you generally need to aim for a little more curve than indicated by the method. In **Diagram 1**, for example, if you want the CB to curve to the direction indicated by the red line, you need to aim for a slightly larger theoretical CB curve, indicated by the blue line. Even though the system isn't perfect, and the results will vary with conditions, it nevertheless provides an excellent reference from which to adjust. If you want to develop a "feel" for aiming massé shots, Coriolis' system is a good place to start.
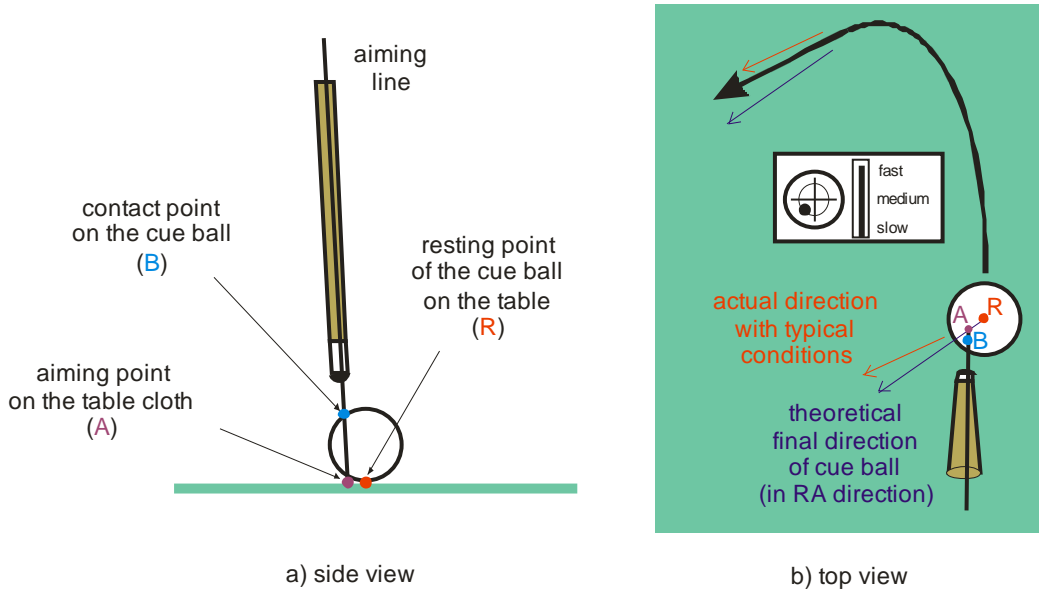
Diagram 1 Coriolis massé shot aiming method

As shown in **Diagram 2**, shot speed is a controlling factor in the path the CB follows. With more speed, the CB's curve takes longer, sending it farther down the table before reaching the final direction predicted by the "BAR" method. However, according to the "BAR" system, the final direction is the same at all speeds (i.e., all of the CB paths are parallel to each other after curving). With greater cue elevation and more curve, more shot speed is required to get beyond and around obstacle balls that are the same distance from the CB.
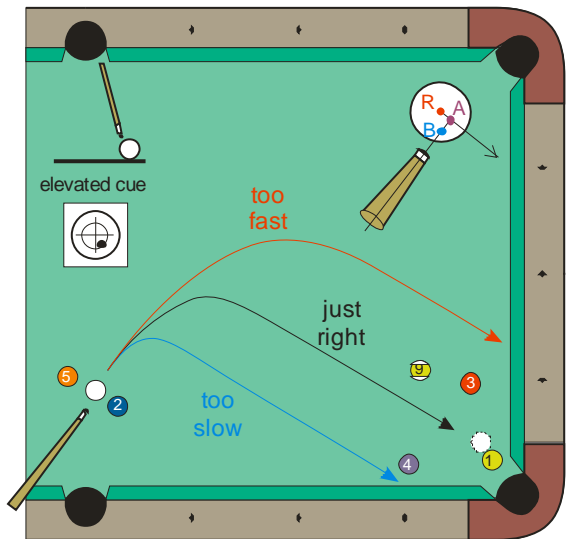
Diagram 2 Massé shot speed effects

Diagram 3 (similar to VEPS Shot #'s 631 and 632) shows a situation where we need only a small amount of curve. The goal is to curve the CB just enough to get past the 11-ball to pocket the 8-ball. A jump shot is an option here, but if the CB hits the 8-ball while airborne (e.g., after bouncing), we risk jumping the CB off the table for a foul. Also, all reasonable kick shot paths are blocked by the 12-ball and 13-ball. A swerve shot (slight massé) is probably the best option here, especially if you are not a very skilled jumper. Only a modest amount of cue elevation and bottom-right English is needed to swerve the CB around the 11-ball for the win. Our line of aim should be well outside of the 11-ball (as shown in the diagram) to give the CB room to clear the 11-ball as it curves. Notice how the aim point ("A") on the cloth is well in front of the CB to create the desired "RA" line direction. As indicated above, shot speed is important as well. If hit too softly, the CB will curve early and possibly contact the 11-ball. With too much speed, it will curve too late and go long of the target.
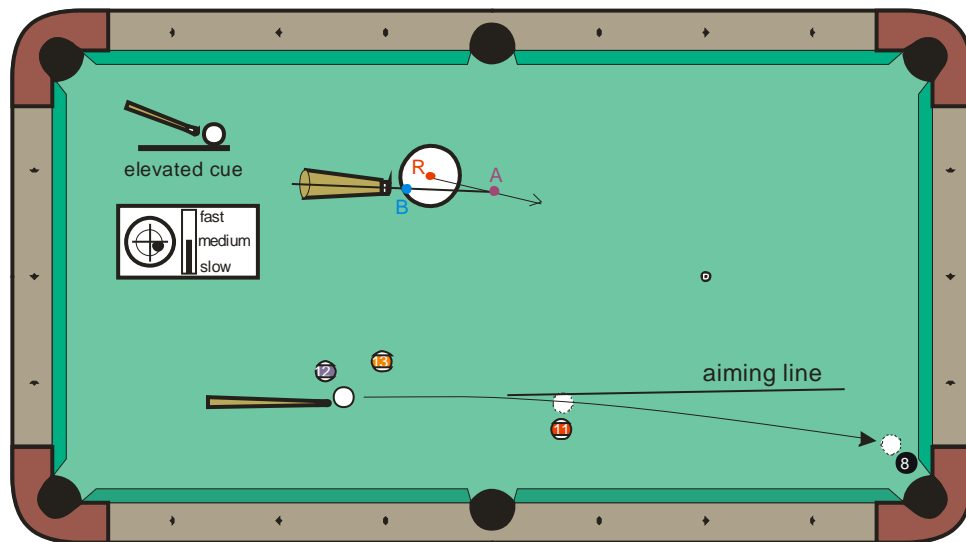

Diagram 3 Example small-curve swerve shot

Diagram 4 (VEPS Shot #634) shows an example where a larger-curve massé shot is required. Again, all reasonable kick shot paths are blocked, and the 11-ball and 12-ball take away the jump shot option. As with any swerve or massé shot, a good first aiming step is to visualize the desired final direction (after the CB curves). Then visualize a line through the resting point of the CB at a slightly bigger angle than this (line "RA"). Then determine the required aiming line of the shot. Here, we need to aim to get past the 11-ball. Where the vertical plane through the aiming line intersects line "RA" defines aim point "A" on the cloth. Now all that remains is choosing a comfortable cue elevation and tip-contact point on the CB that targets aim point "A."

For a given cue vertical-plane direction (i.e., aiming line) and desired final curve direction (defined by line "RA"), there is a range of cue elevations and tip contact points on the CB that target the necessary aiming point ("A") on the cloth. As a general rule, it is advisable to use as little elevation as necessary. With higher elevation, there is a greater risk of jamming the CB into the table. At the same time, however, there must be enough elevation to avoid a miscue caused by aiming too low on the CB. You should experiment by varying the cue elevation and tip position (and shot speed) for a given aim point on the cloth to help develop a feel for these effects.

Obviously, massé shots like the one in Diagram 4 require a fair amount of practice to develop a feel for the speed required. Also, depending on conditions, you might need to adjust the "RA" direction line more at higher cue elevations to compensate for the non-ideal characteristics of the system.
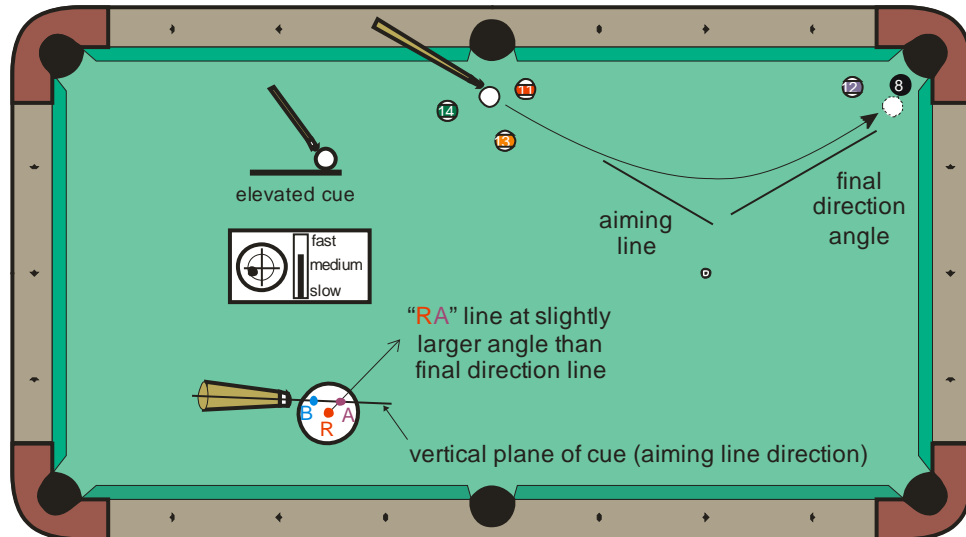
Diagram 4 Example large-curve massé shot

Now let's discuss equipment and technique. Generally, a regular playing cue is suitable for massé shots; however, some people might prefer a shorter cue (but with more weight than a jump cue). You also need a good tip that holds chalk well and grabs the CB. You definitely do not want to use a phenolic tip, typically found on jump and break cues. It goes without saying that regardless of the type of cue, it must be supported by a stable bridge. To this end, when possible, brace one leg against the table or up on the rail or playing surface. Additional stability can be realized by bracing the bridge hand against the body or raised leg. For more speed, use a longer bridge length so you can accelerate smoothly during the forward stroke. Finally, don't be afraid to follow through into the table. All of this technique advice is demonstrated in **NV B.88**, and additional advice and examples can be found in **NV B.41** and **NV B.42**. For more information and resources, see "massé shot" in the FAQ section of my website.

I hope you are enjoying and benefiting from my series of articles featuring shots and gems from the "*Video Encyclopedia of Pool Shots (VEPS)*." Example shots from the fifth VEPS DVD can be viewed on the VEPS website or at *billiards.colostate.edu* under **NV B.87** through **NV B.93**. Next month, we'll look at some classic proposition shots.

NV B.41 - Coriolis masse shot aiming method with a large-curve example
NV B.42 - Coriolis masse shot aiming method small-curve example
NV B.87 - Jump shot technique, from VEPS V
NV B.88 - Massé shot technique, from VEPS V
NV B.89 - 9-ball racking strategy, from VEPS V
NV B.90 - 8-ball and 9-ball run-out examples, from VEPS V
NV B.91 - Frozen-throw-down-rail proposition shot, from VEPS V
NV B.92 - "Impossible" cut shots, from VEPS V
NV B.93 - Famous trick (artistic pool) shots, from VEPS V

normal video

Good luck with your game,
Dr. Dave

<u>PS</u>:

- I know other authors and I tend to use lots of terminology (e.g., squirt, throw, stun, ball-hit fraction, etc.), and I know not all readers are totally familiar with these terms. If you ever come across a word or phrase you don't fully understand, please refer to the online glossary on my website.

- I want to thank Jim Valasina. He graciously proof-reads my articles every month to help find errors and make suggestions. My article quality is better as a result of his efforts. Thanks again Jim!

Dr. Dave is author of the book, DVD, and CD-ROM: "The Illustrated Principles of Pool and Billiards," the DVD Series: "The Video Encyclopedia of Pool Shots," and the DVD: "High-speed Video Magic."