

## Lift-Kicking: Redefining What We Have Called Kick

### A Conversation between Dick Taylor and Jim Galanes

DT. The problem: The time between a stopped ski and release in a “kick” in classical skiing is .1 - .2 sec, the blink of an eye. You may sense it, but it’s too fast for coach or athlete to see just where and how it happens. There is evidence for this. In an Australian study experienced and novice coaches were asked to visually evaluate sprinters’ technique. Surprisingly, the experienced coaches were no more accurate than the novices, which means neither was able. In another study, done by Vic Braden, a former professional tennis player, coach and analyst, Andre Agassiz’s forehand was analyzed with high-speed photograph at every 8<sup>th</sup> of a second. Agassiz claimed how he rolled his wrist to achieve his great forehand, and coaches everywhere then taught the forehand that way. Braden’s photography, however, showed he didn’t roll his wrist until well after the racket struck the ball. In the meantime many an elbow and wrist was injured through misconceived admiration of the great player. Braden’s point is that athletes seldom can accurately explain how they do the things that make them great.

JG. True enough, but I would also suggest that video and most who analyze don't see what is actually going on in the kick or other movement, especially when it comes to the fast force production, relaxed movement and the kinesthetic feel of the muscles.

DT. One solution is to add emphasis to the movement, but that extends its duration, slows it down so eye and thought can take it in. That may satisfy our aesthetic sense of position, but it does not reliably indicate a better movement pattern. (A coach may think he/she sees a late kick, for example, but you can only see the result, follow-through, of a kick, not the "kick" itself. If you slow the kick down, until the coach is satisfied, you’ll have slowed your kick and your propulsion). (Some years ago I looked at Val di Fiemme World Championship videos of the relay start with Dave Chamberlain. We saw quite clearly how the starters who were kicking the hardest were among the last out of the stadium. The leaders seemed to be just stepping quickly, lightly along.)

JG. My feeling exactly. Even today when I ski and teach I prescribe the notion that if you have the sensation of a strong kick or poling motion, the motions are too slow to optimally produce power. I know how with my skiing both skate and classic the appearance is of a strong kick or poking motion but it is exactly the opposite of what I feel I am doing and the signals I am sending the muscles. Similar to when I am doing weight training. Bench press for example, with heavy loads, I am trying to press that weight as fast as possible, although it is not fast. Doing this enables me to squeeze out a few more reps than if I lift with a focus of slow and steady. The Nikolai Anikin theory of a strong punch never resonated with me. In both skate and classic the position of the body over the kick and forward momentum determines if one is in the position to kick quickly.

DT. Another solution is to come at it differently, so we don’t have to depend on eyes or feeling: We know that speed is inversely proportional to the time of standing. Applying that, it’s easy to experience what happens when you do, for example, a 100 meter acceleration on the track. You run the first 50m with the speed you have, the second by cutting the time of standing. In other words, you get away from the ground sooner. It’s worth a second over the distance.

JG. Yes, the longer we kick, push, the slower we are going. I refer to it in both techniques as ground contact time. What people forget is that they look at these fast skiers on video in slow motion and they see these extended movements. Long and flowing. Yea, I like that! But what they forget to account for is the velocity over the ground is fast so the ground contact time is much less than a slower skier going through the same range of movement. It is painfully obvious to me that at high speed the only way to go even faster is to reduce the ground contact time, hence increase power outputs. Kicking and poling harder, if even then, will only increase speed for a very short time, as it is too expensive.

DT. You can’t do that by toeing down more forcefully. It’s too difficult, if not impossible to add force at high speed. To put it simply, there’s not enough time. Certainly its too cost inefficient, too tense. Speed is dependent on tension release, like a bow string, and runners practice this sort of release with “ankling.” Nicholas Romanov, PhD, in his book *The Pose Method of Running*, well-schooled in Russian

systems-dynamic movement theory, extends this idea to basic running gait by simply lifting the heel instead of pushing off the support foot. Since any gait involves both legs simultaneously, the simple “fall” or forward rotation of the body (from the ankle) over the ball-toe “rocker” of that support foot (approx. 6° - 30° depending on speed and terrain) creates the necessary toe-down force to stabilize it (give it grip) for the fleeting moment it requires. What remains is simply a release upward from that (eccentric, pre-flexed) tension, a lift away from the ski. As biomechanist David Loney says it: “The muscles do their fastest work when they are unweighted.” Movement becomes the work of the body’s natural elasticity and springiness.

JG. I like the concept of pose. I need to digest the thoughts more but in both running and skiing I think and teach the counter movement during the kick. Leg swing forward in skiing, knee lift in running aid in supporting a quicker kicking movement by lifting the body forward and off the kick. Of course we need to take care that this does not lead to over striding.

DT. It is not effective to think about pushing off, for speed is a release phenomenon. From that point of view lifting the ankle couples easily with the leg swinging forward and the lean of the body, and the whole body becomes the stride. The center of mass flies slightly higher and more forward, in skating the skis flatter and in slightly closer beneath center of mass. In short, the faster you release from the ground, the more naturally and quickly greater space is created for your forward swinging leg to pendulum through unhindered as your weight shifts to the gliding ski.

JG. I like this description. I had a long debate last winter with an old timer who still likes the kick the soccer ball notion for describing forward movement. I do feel and prefer to think of launching the whole body forward onto the gliding ski.

DT. As a top master skier put it after making this small change: “The ‘fight’ goes away but the speed stays.” And the day following a first focused session with “lift-kicking” your calves and hamstrings will tell you they have worked in fresh ways, which tells you that toeing-down/plantar flexion has still happened with enough force, but without your having to “do it.” Result: more speed, less fatigue per stride.