



Photo by Carole Bettenhausen

BFS Vice President John Rowbotham teaches perfect squatting and spotting technique at a recent clinic he gave at Sickles High School in Tampa, Florida.

## A Closer Look at the *PARALLEL SQUAT*

Answering the critics, once again, about this essential BFS core exercise

**W**hen BFS started 32 years ago, one of the most controversial aspects of our program was our promotion of the squat. We stood by it then as one of the best exercises for athletes, and we stand by it now.

Much of the controversy originated from the belief that squats were harmful to the knees, an idea that was introduced by Dr. Karl K. Klein when

he published the results of a study in 1961 that concluded that full squats could adversely affect knee stability. In the years that followed it was shown that there were flaws in the study, and the results could not be reproduced. Further, other studies showed exactly opposite results, namely, that weightlifters and powerlifters tended to possess tighter knee joints than control groups and were less susceptible to knee inju-

ries. And even though Klein in his later writings said he was not opposed to parallel squats, the damage had been done.

In the years that followed, weightlifters, powerlifters and sport scientists were eventually able to convince the medical community and lay public that the squats were not harmful to the knees. Now the most appropriate motto about the importance of the squat exercise for athletes says to the effect,

“If you don’t have the squat in your program, you don’t have a program!” However, the question still remained about just how low an athlete should squat: to parallel? below parallel? And how do you determine parallel?

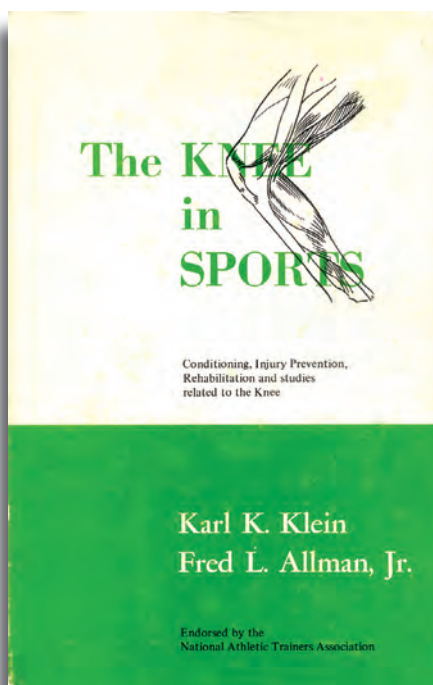
### How Low Should You Go?

The guiding principle in squatting is that it’s necessary to squat so that the top of the upper thighs are at least horizontal to the floor so that the hamstrings are strongly activated. The hamstrings (rear thigh muscles) are a key muscle in sprinting. If you don’t squat low enough, you only activate the quadriceps (front thigh muscles). Further, if an athlete does not squat low enough, then they will not improve knee stability; and many even decrease knee stability by creating muscle imbalances.

At BFS, we offer a simple test to help athletes and coaches determine the proper depth. It’s called the marble test. If an athlete were to place an imaginary marble on the middle of the top of the thighs during their deepest squat position, which way would the marble roll if it were real? If the marble rolls towards the knees, the athlete is not squatting low enough. If the marble would stay

stationary or roll towards the lifter’s hips, the depth is fine. What you’ll find by using this standard is that the bottom of the thighs has to be below parallel at the bottom of the squat. The marble test is better than judging the position of the bottom of the thigh, as athletes with large legs would be required to squat considerably lower.

Does BFS have any problem with an athlete squatting lower than parallel?



Karl K. Klein was responsible for much of the controversy surrounding the squat. Details about his controversial 1961 research study on the squat can be found in *The Knee in Sports*, published in 1969, which he coauthored with Fred L. Allman, Jr.

Certainly not. All we are saying is that an athlete must squat to at least parallel to effectively work the hamstrings. As for the sport of powerlifting, the extraordinarily high poundages lifted by many of today’s powerlifters suggest that there has been considerable leni-

ency among some organizations as to what parallel is, along with the supportive gear that can often add hundreds of pounds to a powerlifter’s best result in this exercise. Further, the hyper-wide stance used by many powerlifters is not the athletic stance that BFS believes would have the best carryover to athletics. Another way to think about this is to say that powerlifters are trying to lift the heaviest weight possible over

the shortest distance possible, whereas at BFS we are trying to lift in such a manner as to have the best carryover to athletics.

Since Olympic weightlifters squat all the way down, and in competition actually bounce out of the bottom position, why doesn’t BFS recommend this style? After all, knee injuries to competitive weightlifters are rare, especially compared to other sports. What is wrong with going all the way down?

First, if an athlete has a qualified Olympic lifting coach to work with them on this squatting method and the coach believes this form of squatting is superior, fine. But the reality is that a coach in high school may have 50 kids to work with at the same time, but there are relatively few qualified Olympic lifting coaches in this country and it is difficult for any strength coach to give the one-on-one attention this type of squatting deserves. Further, it’s not so much that squatting deep injures the knees but that it places the lower back at a higher risk of injury.

Unless an athlete has exceptional flexibility and proper supervision, what often happens when an athlete squats all the way down is that their lower back will round. Rounding places

high, unnatural stresses on the lower vertebrae of the back (L3, L4 and L5). Further, this stress is compounded by the fact that the compression forces on the spine have been estimated to be six times greater at the bottom of a full squat than at the top (so that an athlete squatting 200 pounds would have 1,200 pounds of compression forces at the bottom). Again, if an athlete has exceptional flexibility and one-on-one

*...squatting all the way down doesn’t work the quads and hamstrings throughout the full range of motion.*

coaching from a qualified Olympic lifting coach, it would be better to go with a parallel squat, or slightly below.

Finally, there is the argument that squatting all the way down doesn't work the quads and hamstrings throughout the full range of motion. That's true, but that's why BFS has made glute-ham raises and lunges *high-priority* auxiliary exercises. Both of these exercises put minimal stresses on the lower back while working the quads, especially the inner thigh muscle called the vastus medialis (which crosses the knee joint and is therefore key to maintaining knee stability) and all four heads of the hamstrings.

## Safety Precautions

In addition to proper technique, there is the issue of safety in performing the lift. Because relatively heavy weights can be used in the squat, it's essential that proper spotting be used. Although it's possible to squat safely with one spotter (standing behind the lifter), we prefer that three spotters be used (two at the side and one behind). In addition to spotting, the side spotters can judge spotting depth and technique and can encourage the athlete to break personal



Bruce Klemens photo

If you use the bottom of the thighs to judge parallel, lifters with large legs such as Germany's Gerd Bonk would have to squat lower. In this photo, Bonk had squatted this weight three times (518 pounds), and then on his last rep tossed the weight overhead and dropped it in front of his body. Wow!

records. The instructional video that is now available on our website will demonstrate proper spotting technique.

Finally, proper equipment should be used. It's best to squat inside a power rack, with safety pins adjusted to the proper height. However, the safety pins should be thought of as more "death control," that is, a last-resort method of ensuring the safety of the athlete, as dropping any barbell on these pins from more than a few inches can easily damage the barbell. Also, it's better to use Olympic barbells that have center

knurling, to more properly secure the weight on the shoulders, and a stiffer barbell. The more flexible (and more expensive) Olympic bars are great for power cleans, but that same flexibility makes it difficult to control the barbell during a squat.

As we have done for the past 32 years, BFS stands behind the parallel squat as one of the most effective core exercises for improving athletic performance.

Again, it's difficult to show proper squatting and spotting technique in one short article or with a few photos; therefore we've posted a video clip of squatting technique (from our exercise instruction DVD) on our website. It will remain there until the publication of our May/June 2008 issue. Also, as detailed as this video is, nothing beats having a BFS clinic to ensure that athletes are performing the lift correctly and coaches know how to demonstrate and teach perfect technique. BFS

Because it's difficult to understand correct form in the parallel squat from just a few photos, we have downloaded the complete parallel squat portion of our exercise DVD onto our website using the Maxcast format as shown. It will remain there until the publication of our May/June 2008 issue.

