Explosive Lifting for Sports
Enhanced Edition

Harvey Newton
Human Kinetics, Champaign, IL, 2006
Xiii + 191 pages;
Extended Book Review by Simon Jenkins

OVERVIEW
This book is written for athletes and coaches who want to incorporate weightlifting exercises such as the snatch, clean and jerk into their strength and power training programs. The primary aim is “to teach safely and methodically the proper sequences for performing explosive lifts” (p.xii). The author, Harvey Newton, is a former U.S. Olympic team weightlifting coach and was the first U.S. member of the International Weightlifting Federation’s Scientific and Research Committee. The book is accompanied by a DVD, which has step-by-step instructions on 30 exercises. There is also a DVD-ROM with 24 video clips enhanced using Dartfish software. The DVD certainly helps the book meet its aim in terms of safe and methodical teaching, in so much as book can do that. This book review is not intended to be comprehensive, but rather to highlight some key and interesting points with regard to coaching.

ANECDOTES AND HEURISTICS
It is the author’s accompanying insight and analysis – that can only come from understanding both the art and science of coaching weightlifting - that makes this book particularly interesting. The numerous anecdotes, especially from the author’s work with USA Cycling, make important points about principles of training and weightlifting technique. For example:

Unfortunately, one coach advised junior cyclists to perform squats with their feet staggered fore and aft about the same distance apart as bicycle pedals. Although this appeared to be quite sport specific, a squat cannot be performed safely in this position. Further, with the already better-than-average leg strength most cyclists possess, the weights used were relatively heavy. Squatting in such an awkward position was asking for trouble. This is an example of taking sport-specific training too far. (p. xi)

There are also anecdotes about how, before the 1992 Olympic Games, Lance Armstrong was advised by sports scientists at the US Olympic Committee to avoid plyometric training; how a top female cyclist required simple jump training on stairs to improve her group sprinting performance after short-term squatting in the off-season led to minimal benefit; and why a champion pistol shooter, Ruby Fox, felt that weightlifting was beneficial for her shooting due to “the total focus of having to execute the lift with split-second timing” (p. 24).

There is a chapter on combining weightlifting and plyometrics, which includes discussion of the frequently mentioned recommendation of individuals being able to squat 1.5 times
their body weight before engaging in plyometric training. About this popular heuristic (‘rule of thumb’), the author brings together the science and art of training in stating:

This book introduces explosive lifting movements that are plyometric in nature long before the ability to squat such a heavy weight is gained. The need to squat 1.5 times one’s body weight is probably a more appropriate suggestion before attempting depth jumps, especially from heights greater than half a meter. This kind of strength demonstrates that the muscles and connective tissues are strong enough to handle a higher level of intensity. (p.33)

PROGRESSIONS
In teaching weightlifting, the author is an advocate of the “Whole-Part-Whole Method” rather than the “Whole Method” or “Part Method;”

While many coaches try to teach explosive lifts [using the Part Method], the result is often a series of segmented portions that lack one coordinated execution. Performing these lifts in segments is very frustrating and inefficient for the novice. … [The Whole-Part-Whole Method] allows for the initial imitation of the entire motion, followed by concentrated practice of segmented portions of a movement, then finally putting the entire movement back together. I prefer this method as it allows a new lifter to initially experience the entire lift (with only light weights), but then learn the finer points of proper technique before bad habits become ingrained. After mastering the most difficult portions in isolation, the full movement is fluid and well coordinated. (p.38)

As an example of learning progression, for the clean, the author recommends the following order: high hang clean pull, high hang squat clean, low hang clean pull, low hang squat clean (all from blocks of an appropriate height) before the full lift from the floor.

From what the author states in the book and DVD about (and for) tall athletes, it would seem to follow that some athletes will need to start with the Part Method because, for example, they are unable to attain a safe and correct starting position for the lift with feet flat on the floor and a neutral spine. The author would reply that these athletes could still attempt a [near-] full clean (for example) by lifting off blocks of a suitably low height.

The chapters on the snatch, clean and jerk are all well illustrated with photographs. Subtle details of lifting technique are intermingled with the basic instructional points, as well as the ‘top-down’ (whole-part-whole) learning progression.

PULLING TECHNIQUES
In the chapter on “Building a Technique Base,” basic pulling technique is described in terms of starting position, liftoff, scoop, jump phase, pull-under, catch and recovery. A set of photographs of a female competitive lifter performing a snatch supplements the text in an effective manner (p. 45-48). There is a section, “Evolution of Pulling Technique” (p. 40-43) that focuses on the “S-pull,” variations in barbell trajectory, and the ‘double knee bend’ debate. It shows the importance of coaches having a historical understanding of technique in their sport and how the evolution of technique is inter-related with changes in the official rules of a sport. Again the author blends scientific understanding and practical knowledge, with many helpful points for athletes and coaches to reflect upon. One of the finer points is also one of the most controversial (if taken out of context) in that it refers to lifting without the use of collars:
The most advanced weightlifting countries further modified technique [in pulling] so that the bar, for the most part, avoids any dragging on the thighs, yet still makes contact even up to the lower abdominal (lap) area. In this case, the body arrives in an efficient jumping position without slowing down the bar, yet the hips are still used to impart a powerful upward thrust to the bar. This thrusting action, not the contact of the bar on the thighs or lower abdomen, results in a noticeable auditory cue for insightful coaches and athletes. Especially in training, where experienced lifters may not use collars to secure weights on the end of the bar, this ringing sound is noticeable at the same time the lower extremities execute a violent upward thrust. Unfortunately, many people confuse this sound with “banging the bar” and deflecting the upward motion needed to succeed with a heavy lift. (p.43)

The author highlights that there is disagreement among experts as to whether the ‘double knee bend,’ which actually involves bending or re-bending of the ankles, knees and hips, can be taught or whether it simply occurs naturally in some athletes due to the stretch reflex phenomenon. In arguing his case, the author concludes by stating:

Those [competitive weightlifters] who successfully transitioned from an era when thigh contact was prohibited to the modern-day pulling style demonstrated that this skill could be learned. I think the technique, which is not much different from the countermovement experienced in a vertical jump, can be taught and successfully learned. (p.44).

In a personal communication with the reviewer, Harvey Newton states the following:

There is a good deal of differentiated writing [1, 2, 3, 4, 5] on the double knee bend, how it occurs, whether it can be taught, etc. There is universal agreement that a natural re-bending of the knees occurs during the upward lifting of a near maximum weight and that this places the barbell/athlete unit into an optimal position for maximal power production. What is not natural, and creates a coaching challenge, is the barbell’s actual contact with the lifter’s upper thighs or abdominal area that contributes to the double knee bend technique’s success in lifting heavier weights. Novices, who drill early attempts at technique by lifting empty bars or dowels, do not exhibit the double knee bend or seek contact of the bar on the thighs. So, while we do anticipate a naturally occurring motion to take place, beginners will not naturally exhibit this phenomenon. The double knee bend, or whatever one chooses to call it, was part of an evolutionary effort in weightlifting during the early 1960s to lift more weight. David Webster, Scotland’s national weightlifting coach at the time, is credited with the early identification of the double knee bend, when he presented evidence from tracings of high-speed film of champion lifters in action. This new modification in lifting technique was presented by Webster in numerous writings in generalist publications and small manuals [5].

This action (contacting the thighs with the bar) was clearly against the technical rules of the day. However, as the practice became widely utilized by teams from all nations, the International Weightlifting Federation wisely modified their rules to allow for this action. Weightlifters and coaches from the USA and many other countries seemed to interpret the technique as one of simply bouncing the barbell off the thighs, which is not the intended purpose of re-bending the knees. As the
The topic drew more attention, coaches formed two schools of thought: (i) the double knee bend can be deliberately taught; or (ii) it is a natural movement that happens too quickly to be voluntarily mastered.

American weightlifting and strength coaches were heavily influenced by Carl Miller, the United States' national coaching coordinator for weightlifting. Miller wrote extensively on the double knee bend [6] and instructed in clinic settings how this action could be effectively coached. Those who claimed that this action cannot be taught seemed heavily influenced by the coaching education programs of the former British Amateur Weight Lifting Association (BAWLA). Charniga [7] provides valuable insight into this debate by correctly pointing out that an over-emphasis on learning this technique can lead to impaired performance. The author concurs that novice coaches and athletes can certainly complicate mastery of the snatch and clean by focusing on a somewhat segmented and mechanical approach of “lift-shift-lift” as often described for the double knee bend. While the author believes the double knee bend can be taught, it is a challenge and likely beyond the need for non-weightlifters. So, if this is a difficult, but effective, concept to conquer, what is the average strength coach to do? The answer is to start simply, gain explosive benefits without confusing the athlete or slowing progress, and move toward more complicated mastery of the full lifts (and the double knee bend) only in appropriate situations.

In an experiment involving sixty collegiate footballers, Gentry [8] found that the double knee bend “does not need to be specifically taught or segmentally practiced in order to improve power clean technique among college football players with novice power clean experience” [8, p. ii].

Newton refers above to Charniga [7], for whom a point of debate is not whether or not the shifting of the knees under the bar can be learned but rather whether or not it can be consciously controlled:

Once the legs have ceased to straighten at the end of the second phase of the pull, the technically proficient lifter shifts the knees under the bar (the bending of the knees and tilting of the shins away from the vertical) in 110 to 140 milliseconds. Furthermore, the time from the end of this phase to full extension...is 160 to 200 milliseconds. The brevity of this action precludes an effectively conscious effort. A conscious effort to “scoop” the knees under would invariably slow the movement. …The shifting of the knees under the barbell in the snatch and clean is a quick reaction:

1. to counter the “toppling over” effect of the barbell on the weightlifter-barbell system …
2. to reduce the increasing moment [of] force relative to the ankle, knee and hip joints as the legs straighten …
3. to draw closer together the center of mass of the barbell and the body in order to improve the mechanical efficiency of the working joints by shortening the force arm of the barbell …
4. to re-introduce the “already working” thigh extensor muscles in order to further accelerate the barbell …
5. to prevent a significant drop in barbell speed …

… The muscles which straighten the legs essentially contract involuntarily, with great speed, immediately following an extremely fast stretch from bending of the
knees. It is a reaction to the knees flexing in as little as 110 milliseconds. Any effort to consciously execute it in parts would slow it down and compromise the efficiency of the entire lift. … Therefore, a “double knee bend” is something one consciously endeavors to perform; whereas, a “shifting of the knees under the bar” is a reaction to the conditions which force it to occur. [7]

SPORT-SPECIFIC TRAINING

The final chapter, “Sport-Specific Training Programs,” is noteworthy because of sample training programs and insightful quotes from coaches in baseball, basketball, football, ice hockey, soccer, tennis and racket sports, track and field, volleyball, weightlifting and wrestling. For example, Al Vermeil, who is a former strength and conditioning coach of the Chicago Bulls and a strong proponent of weightlifting movements for basketball players, is quoted as follows:

“Weightlifters have an extremely high rate of force development and a great use of stored elastic energy in their muscles. Both qualities are important for speed/power sports, so this is our preferred method of lifting for basketball.

We do a lot of lifts from the mid-thigh position off blocks. This forces a player to overcome inertia from zero tension, which helps develop starting strength. Some of the Bulls pull from positions below the knees, which places them in a similar position that occurs in the post. The hip extension and isometric strength of the back is very similar to that needed in low post play.”

SYNOPSIS

Every strength and conditioning coach in sport should have a copy of Explosive Lifting for Sports as a tool for active learning and reflecting upon their practice. As an instruction manual it is undoubtedly authoritative. In terms of bridging the gap between sports science and coaching, and improving coach education, future editions should further tap the author’s expertise in weightlifting.

REFERENCES
