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TRACK COACH

SPRING 2016 / ISSUE 215

TRACK COACH

Spring 2016 I 215

The official technical
publication of
USA Track & Field

TRACK COACH

FORMERLY TRACK TECHNIQUE

215 | SPRING 2016

The official technical publication of USA Track & Field

USATF

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PUBLICATION

Track Coach is published quarterly by Track & Field News, 2570 W. El Camino Real, #220, Mountain View, CA 94040 USA.

The Summer 2016 issue (No. 216) of Track Coach will be e-mailed to subscribers by July 1, 2016.

SUBSCRIPTIONS

$20.00 per year, U.S. or foreign. Track Coach became a digital-only publication in 2015.

BACK ISSUES OF TRACK COACH

Many back issues of Track Technique/ Track Coach, #92-208, are available singly at $5.50 (U.S. delivery)/ $9.50 (foreign delivery) each post-paid. No issues previous to #111 are available.

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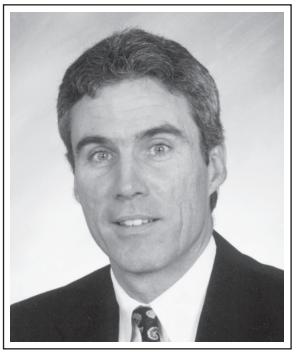
FROM THE EDITOR

RUSS EBBETS



DETRAINING

When the Millrose Games were held at Madison Square Garden, they had a coaches' box at floor level half way down the back stretch. You were packed in like sardines. They had chairs that only got in the way. Everybody stood, and if you sat, you couldn't see anything anyway.

In the 1980s Mary Decker ruled the show. She'd drop in, bang out a sub-4:20 mile and leave the place breathless. As she circled the track, you could hear 18,000 cheering voices follow her lap after lap. It was quite a spectacle.

I arrived early one year, staked out my space in the box and was taking it all in. I had a kid in the mile walk. He'd been a Junior National Champ and for a few years was one of the top guys, especially in the shorter, indoor races. The early meet events were as much for the officials as they were for the athletes. The Garden was down to one big meet and the start lines, finish lines and relay zones of an 11-lapper presented a bit of a challenge for the tuxedo clad referees.

I wondered at it all. But behind me some coach had lost his sense of wonder. He started out hot and was soon going full off. I couldn't help but hear. I got an earful. I remember thinking the coach should consider a career change. The gist of his rant was that his athlete never trained, never listened. I could identify. It must be a universal coach's gripe. The coach finally got silent, I figured he'd run out of gas. I never looked back.

About 10 minutes later his athlete showed up. The coach went to the rail to talk to him. He was a pretty good long jumper. In fact he jumped 28 feet that night. A pretty good jump. I guess we all have our problems.

Evidently there are exceptions but generally most American athletes do a good job training. And as individual sport athletes there is a tendency to train too much. When rest and recovery are mistakenly equated with general sloth we might have a problem.

Training is the dive part of Yakolev's Curve. Stress, rest and adaptation. It is the work part of the daily grind. But the part of that curve we don't pay much attention to is the back side of adaptation, after the the peak or the day after the championship. What gets done then?

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We train and train and train and compete that last time and then what? The body has been honed to a certain level of fitness with all systems "go" straining to attain or maintain peak function and suddenly the stress of the daily grind and the championship meet are a memory. The physiology of the body is all dressed up with no place to go. And from a health standpoint, that's not good.

Detraining is the gradual return to a more "normal" life. Initially one might think this is an easy thing to do. All one has to do is "sit down." But it is not quite so simple.

The body and its various systems have been hyped up to such a level its new "normal" has momentarily become most people's red line.

Championship sport makes some unbelievable demands. At Montreal Alberto Juantorena ran seven races in seven days. For him an 80% effort on day eight would still be a sub-two minute 800. That gives a "quick trip to the cafeteria" a whole new meaning. Michael Phelps swam 17 races in nine days at Beijing, winning his eight gold medals. Most normal people would agree that he deserved a rest. Most coaches would see that what he needed was an active rest.

Improper detraining, post-season, can lead to a host of physical and emotional problems. Restlessness, sleep disorders, anxiety, depression, mood swings and a general inability to tolerate the mundane things of life are a short list. This may explain why the latest athlete to become tabloid fodder has gone off the rails.

The point of training is to peak up and capitalize on the effort and energy that has been diligently directed. Most coaches and athletes do a good job of executing the plan to get "there". Detraining is the plan to get "from there" back to normal existence. Detraining is the difference between a soft and a crash landing back to reality.

A PLAN TO WIN THAT WORKED

Track Coach editor Ebbets details Tudor Bompa's four global training concepts and explains how he used them as the framework for success with a high school 600m indoor runner.

BY RUSS EBBETS

INTRODUCTION

In Tudor Bompa's classic book *Theory and Methodology of Training* he lays out Four Global Training Concepts that are critical for the development of the athlete. Although the title has changed and the book has gone through several revisions over the last 30 years the necessity of a coach's attention to the four concepts of physical development, technical development, tactical development and psychological development have not changed. (1) The four global concepts warrant attention on a daily basis and throughout the phases of training from the weekly microcycle, a monthly mesocycle, a season, year and ultimately a career.

It should be noted that attention to these four areas is a dynamic concern as their import and contribution is not only with the varied stages of training but also can be significantly influenced by the athlete's age and experience. It is through the individual's growth that the careful and shrewd manipulation of these factors and other training variables that will foster directed growth that will result in the desired performance outcomes.

It needs to be underscored that a thorough understanding of these four concepts by the coach allows for a more creative and skillful application of training and training nuances. To that end presentation of these four concepts as a "cookbook recipe" for success would be misleading. It is more proper to see these four concepts as a skeletal outline or scaffold to which the coach's knowledge, experience and wisdom can be applied towards the accomplishment of performance goals.

This paper will discuss the application of Bompa's four global concepts with regards to training and preparation of a high school 600m indoor track runner. Each concept will be discussed individually and then via a case study that will illustrate how the four concepts were integrated into a unified whole.

A final introductory note warrants clarification. The four global concepts in fact make up an integrated whole. Success at the highest levels

cannot be attained without critical attention to all four. It needs to be mentioned that the development of the four global concepts in a sequential manner—physical precedes technical which precedes tactical which precedes psychological—although defensible is actually an oversimplification of the process. Development of these four concepts is both a horizontal and vertical process—at the same time. The coaching challenge here is to develop each individual concept while at the same time recognizing its simultaneous contribution and influence to the larger, long range goal.

These concepts can be represented graphically with a triangle/pyramid (Figure 1). This visually allows one to see that each individual concept makes a global contribution and how broadening of one level leads to a higher peak, a graphic example of the age-old maxim of "the broader the base the higher the peak." To that end our discussion begins with physical preparation. (14)

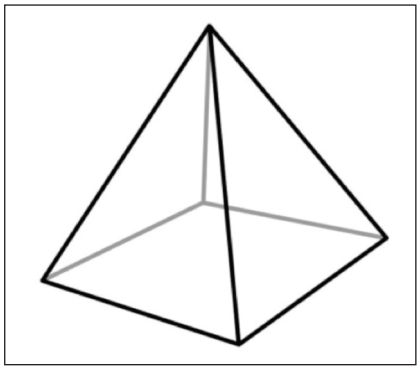


Figure 1

PHYSICAL FITNESS PREPARATION

"Physical fitness is the limiting factor in technical development"

Physical fitness can be defined as the ability to meet present and future physical challenges with success. It is minimal in the infirm and can be highly developed in the competitive athlete. The term Bompa used to broaden the concept of physical fitness is work capacity.

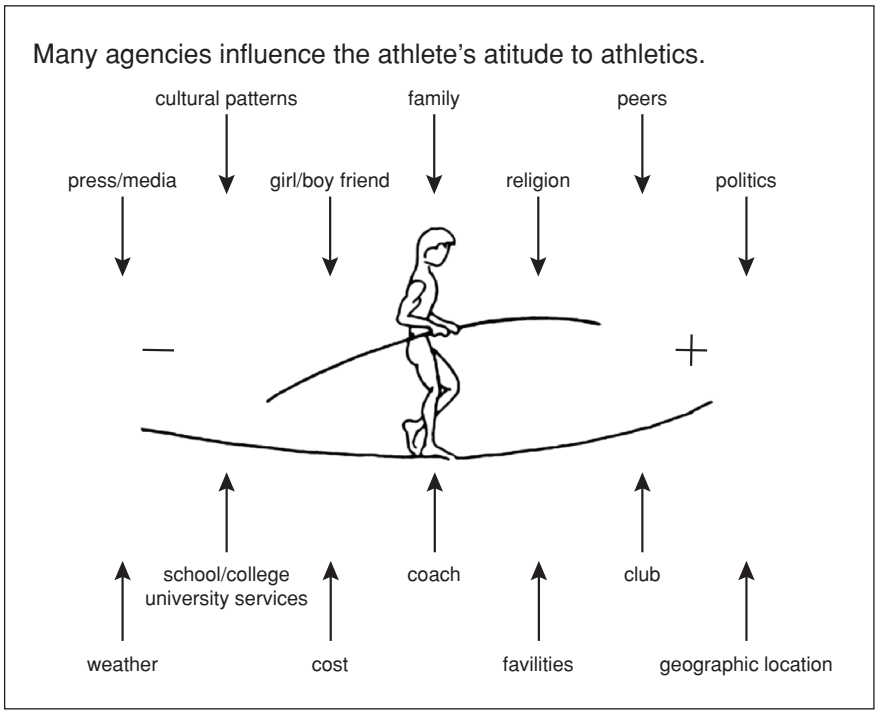


Figure 2

Work capacity is a multi-faceted concept that variously describes an athlete's ability to generate a measurable level of work output that may variously be measured in miles run, pounds/kilograms lifted, technical elements completed and also the development of or sharpening and strengthening of a body part that allows for the required specific movements and global actions necessary for technical execution.

The means by which work capacity is measured has become more sophisticated over the last 25 years. Today's measures commonly use watts (joules/second) or joules (newton/meters) of work for intensity and velocity (meters per second run). A third area of attention, often ignored, but directly related to work capacity is that of recovery. Unfortunately for many, recovery is seen as a passive process. While it is true that all the benefits and adaptations of various "work" components are realized during the athlete's recovery phase often little to no effort is taken to enhance this process.

For the elite athlete recovery cannot be a passive process. To that end the coach and athlete need to be on the same page with regard to the timing and application of such ancillary "work" as diet, nutrition, hydration and supplementation, warm-up and warm down protocols, sleep habits, and how to handle the positive and negative influences of teammates, family, friends (Figure 2, from Dick). Additionally there should be attention to the use of allied professionals for flexibility, massage, spinal and joint manipulation along with meditative practices that

promote an "I can do this" mentality that works towards strengthening the will and resolve to achieve a desired goal.

While it could be argued that work done in the above paragraph is not "physical" it does require time and mental effort that must be budgeted into each athlete's 24-hour or weekly microcycle. While the direct effects of the above may be difficult to quantify and measure with any degree of accuracy I will assert that their inclusion from the start of a long-term practice plan is critical for the success of the plan. This is an example of the vertical and horizontal integration of factors mentioned in the introduction.

A final point warrants mention. This program was designed for a 17-year-old adolescent. While not technically a "child" he was not a full-fledged "adult" either. An appreciation of this fact is critical for several reasons. This particular athlete was still physically growing and care must be taken so that energies for growth and development are not shunted away by emphasis on training and competition (2). Other factors such as current academic pressures, preparations for the coming transition to college and the abovementioned influences of family, friends, teammates, etc. need be given their due.

Below are six areas of attention necessary to fully develop the import of physical fitness.

1. Biomotor Skill Development

There are five generally recognized biomotor skills. (1, p.213-263) The skills allow an athlete to physically express their sport. While the synergistic combinations differ from sport to sport it should be noted that nuances within specific sports or events will be present due to the differing constitutional make-up of individual athletes.

The five biomotor skills may be briefly defined as speed (meters/second), strength (ability to produce force), flexibility (joint, ligament, tendon, fascia range of motion and elasticity), endurance (ability to produce repetitive efforts) and the ABC's of agility, balance, coordination and skill. (Side note: it has been interesting to note that in USATF's Coaching Education "agility" has always been defined as the physical ability to change directions. When I studied at the Institute of Sport and Physical Culture in the USSR in 1983 they added a cognitive component "agility of the mind" that was also included in the expanded understanding of the word. It was felt that the "agility of the mind" should be encouraged at all phases of training as it promoted "cleverness" and an invaluable ability to problem solve on the spot. This was underscored in the Russian professors emphasis of promoting a cheerful nature quoting from Tolstoi, "The angry man is not clever.")

EACH BIOMOTOR SKILL NEEDS TO BE ADDRESSED IN SOME WAY, EVERY DAY TO PROMOTE OVERALL DEVELOPMENT.

To promote overall development of each biomotor skill needs to be addressed in some way, everyday. It should be noted that the "training" or attention to the skill may be seemingly insignificant but even this minimal, although regular repetition will develop, clarify and stabilize the neural pathways of the particular quality which will lay the foundation for technical development. This becomes a very much a "use it or lose it quality."

Examples of *daily* actions used in a 600m preparation would include:

Speed – daily attention to "speed" running actions with 50m strides, including arm action, knee/foot actions, forefoot ground contact and plyometric exercises such as skips, bounds and jumps as part of the dynamic warm-up.

Strength – weightlifting sessions, medicine ball work, push-ups

Endurance training – circuit training, aerobic distance runs, no-sit-down rule for practice

Flexibility – joint range of motion, yoga-type stretches, assisted stretches

ABC's – addressed in the dynamic warm-up with foot drills (3), one-leg balance work, foot placement drills, arm-leg coordination, timing of finish dips technique, core stability work.

2. Intensity

A more accurate heading might be "Intensity too soon." One of my coaching maxims is that "insecurity over-prepares." It might be added that insecurity also expects immediate results. Performance is improved over the course of time, not with the click of a stopwatch but rather with the turn of a calendar page. Classically there has been the juxtaposition of volume and intensity.

With regard to the 600m runner the volume would be the development of a "base," the aforementioned biomotor skills, general conditioning and the slow and methodical conditioning and adaption of the parasympathetic nervous system. In sum the goal is to develop a broad base to the pyramid.

Intensity too soon before the adaptive qualities of the body are established will lead to neural overtraining. This can be the result of high doses of anaerobic work such as interval training, anaerobic repetition runs (i.e., 3-4x300m 90-95% effort), high dose plyometric work or heavy weight training. The initial results of this misdirected work may be encouraging with even stellar early season efforts but it may also soon be apparent that it was a case of "too much, too soon" with the athlete unable to sustain the early season performances in the championship phase of the training plan. The steeply arching line of Figure 3a depicts the early peak and the disappointing and unpredictable results of later in the season.

3. 10-Day Rule

A quick check of any physiology text will note that the average recovery time for a muscle after an exhaustive effort is 24-48 hours. That is a significant range of time that can be influenced by any number of lifestyle factors (hydration, nutrition, sleep, attitude, etc.) and by the fact that in total some athletes constitutionally will recover faster than others.

In Bompa's *Theory and Methodology of Training* he has a chart detailing the recovery and normalization times of various systems of the body. Of particular note is that the nervous system takes 7x as long as the muscular system to recover (1, p.94). Ignorance or willfully ignoring this fact predisposes the body to neural overtraining and subsequent dampening of the body's neural responses of explosiveness and speed and power.

Canadian coach Charlie Francis stated that after any personal best he took care to prescribe active rest for 10 days to allow the nervous system to fully recover. Carelessly ignoring this fact courts neural overtraining. The other possibility is the negative progression of fatigue syndromes including decreased performance, illness and injury. (2, Figure 3b: Fatigue Syndromes)

Numerous examples of this are evident. Two telling examples can be drawn from the 2008 Olympic Trials in Eugene Oregon. In the quarterfinals of the women's 100m Marshevet Hooker blasted the field with a 10.76 but then failed to make the U.S. 100m Olympic team. Her time of 10.76 would have won the Olympics.

In the men's 100 final Tyson Gay ran a wind-aided 9.69, at that time one of the fastest 100m times ever recorded, legal or not. What many forget is that in the Trials Gay misjudged the finish line and was forced to make a heroic spurt in the last 20 meters just to make to the next round. Those two superlative efforts resulted in a pulled hamstring and a DNF in the initial round of the 200m.

In sum, any superlative effort requires significant active rest to allow the nervous system to restore itself. The 10 days is arrived at by averaging the standard muscle recovery time of 24-48 hours (average 36 hours) and multiplying it by the 7x recovery time to arrive at 252 hours or roughly 10 days. As mentioned above some athletes will constitutionally have the ability to recover in seven days while others may need 14 days. But the greater fact and unfortunate reality is that for most coaches neural recovery is not on the radar screen.

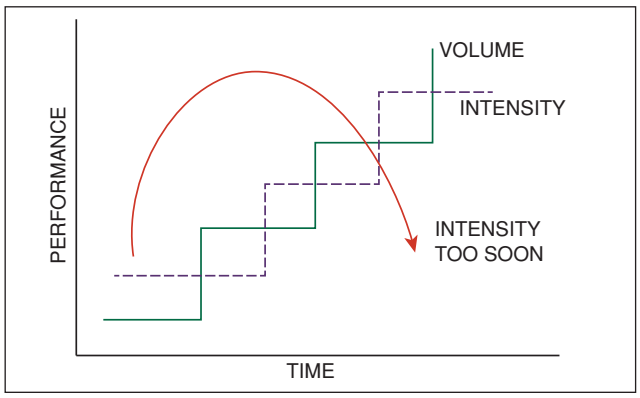


Figure 3a

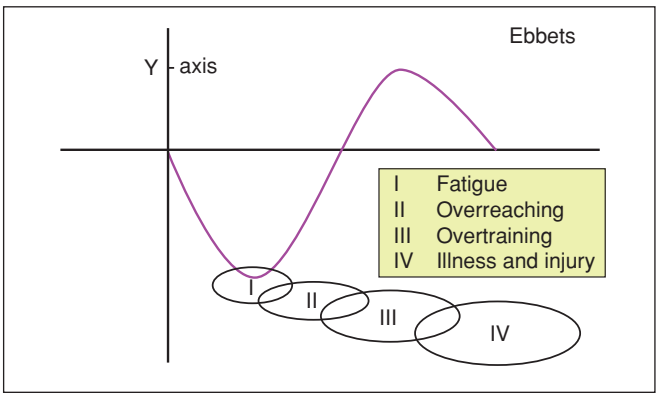
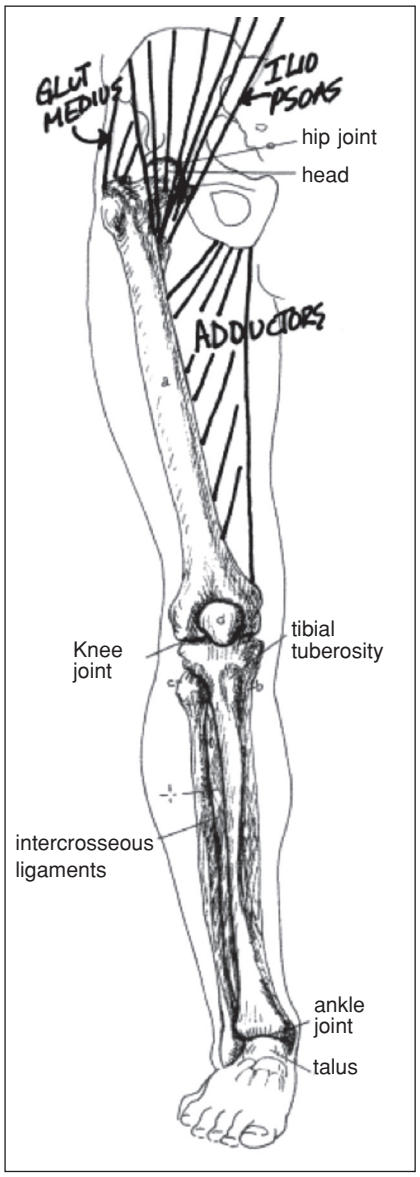


Figure 3b: Fatigue Syndromes

4. Hip Strength and Dynamic Stability

Hip injuries are seen as the most crippling injury to the lower extremity because one cannot ambulate or bear weight. The muscles of the hip joint (femuro-acetabular joint) have a dual role of providing stability and propulsive force. Tom Tellez, the great sprint coach of Carl Lewis and Leroy Burrell stated that in sprinting "drive comes from the hip."

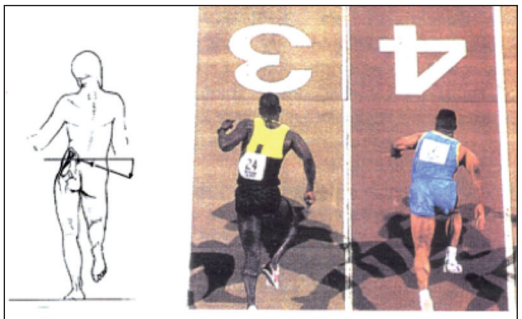
Two issues warrant mention. Because the hip joint is a ball and socket joint it allows for a great degree of motion, theoretically 360º of motion. But running is for the most part a linear activity. The hip muscles therefore come to act as dynamic stabilizers (glut medius, psoas, adductors) that must allow one to paradoxically hold a position while moving.



The primary dynamic stabilizer of the hip is the glut medius. Weakness of this muscle can be evidenced with a Trendelenburg Sign (Figure 4) which is a lateral drift of the pelvis. While a Trendelenburg is clinically significant in a patient as it forecasts excessive wear and tear on the body it is also a competitive disadvantage for an athlete. This is significant in performance athletics as it indicates a loss of forward momentum, decreased force application, an increase in ground contact time which individually and collectively are detrimental to performance.

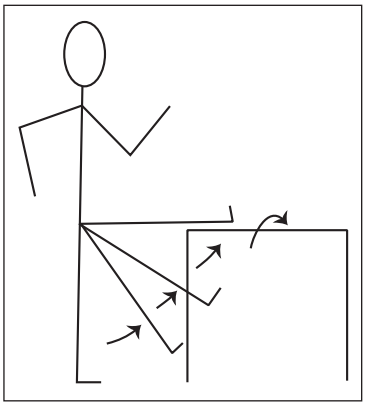
A second concern with poorly conditioned hip muscles is "foot splay." The anterior fibers of the glut medius serve to internally rotate the hip allowing for the foot strike to happen with the toes pointed in the direction of movement. At the limits of speed endurance, with a poorly trained glut medius, the anterior portion fatigues early and the foot/leg drifts into external rotation producing a toeing out or foot splay. This foot strike is also problematic as it again produces a loss of force production, an increase in ground contact time and additionally a decrease in stride length, all resulting in decreased performance.

Figure 4



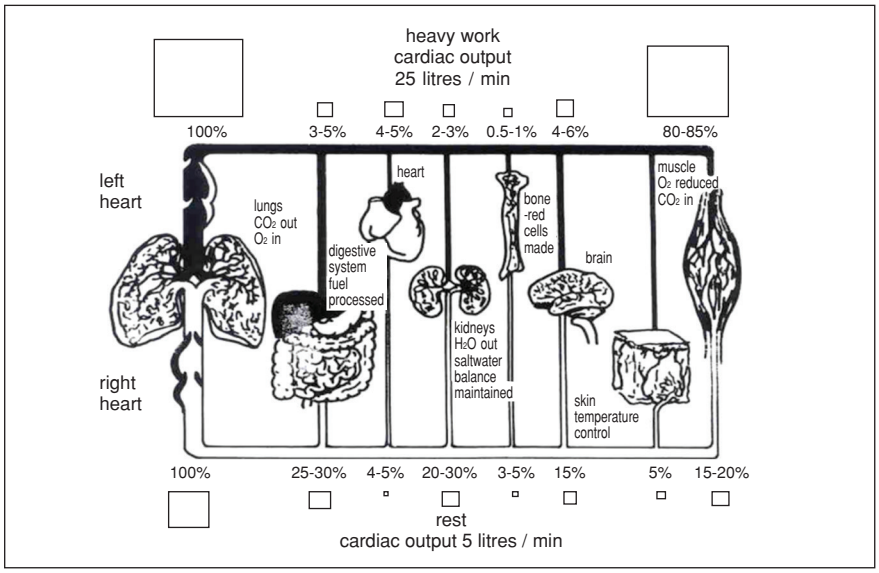
2. Positive Trendelenburg seen with World Class Sprinter in Lane 3

Foot Splay



Leg Over Hurdle Drill

The simple "Leg Over Hurdle Drill" can be used to condition the flexion/extension of the hip. This drill not only works on the concentric/eccentric contractions of the hip but has a secondary benefit of improving single-leg balance sense. Initially this drill was done bilaterally 20x without time working towards a goal of 20x in 20 seconds. The hurdle height is roughly the length of a pant inseam, about 33."



Note blood shunting to brain with exercise. . . brain loses 40-75% of blood flow - from Dick (13)

5. The 6-Foot Drills

One cannot run fast or jump far without a strong foot. While few coaches would disagree with this statement fewer coaches use any means to actively address the strength or stability of the intrinsic foot muscles.

The 6-Foot Drills (3) tone and condition all the muscles of the foreleg that are responsible for both dynamic stabilization and propulsion (anterior/posterior tibialis, peronei, gastroc/soleus). In that a stronger muscle has an improved neuromuscular response a secondary benefit to improving the foot's neuromuscular response would be an increase in one's balance sense.

Improved balance has a positive impact on one's ground contact time. This increased foot coordination would also improve force production. It should be noted that an improvement in this area by as little as 1/100th seconds per foot strike translates into ½ second per 100m (50 strides) or three seconds in a 600m.

6. Automation of Actions

Blood is shunted from the brain, a loss of between 40-75% of its blood flow when the heart rate rises above 145 beats per minute (BPM). This becomes significant since much of performance efforts are completed with the heart rate above 145BPM. The loss of cranial circulation has a negative consequence as it diminishes one's ability to think and reason. Sense and sensibilities wither and more basic or animalistic tendencies directed by the cerebellum dominate one's actions. The significance of this is that many of the brain's "higher functions" take place in the cerebral cortex (thought, logic, reason) become negated by this physiologic reaction. This situation becomes exponentially worse as the heart rate reaches the limits of speed endurance or a heart rate above 170 BPM.

As an aside, one of the reasons police have been discouraged from high speed auto chases is that the adrenalin surge of their sympathetic nervous system significantly impacts their heart rates and negatively affects their judgment called "High Speed Pursuit Syndrome." There is not only a public safety issue but one of the problems that has arisen from the lapse of judgment when the chase ends are the beatings and shootings that have been replayed endlessly on viral Internet videos. (8) In the later stages of a race, once the heart rate has attained 145BPM and the shunting process is well underway and coached (or uncoached) movements, thoughts and actions will be exhibited. To that end it becomes incumbent for both the coach and athlete to automate desired actions, as possible, narrowing the window in the shunting process through development of the athlete's fitness levels and work capacity.

Correspondingly it is critical within this process that the technical execution of desired actions be refined to the point of instinct or automatic actions through repetitive drill and exacting technical execution of the drill's action. The desired result being that in high stress situations (both physical and mental) in spite of blood shunting biomechanically efficient postures and actions are maintained. And that these actions and postures are executed as flawlessly as possible.

TECHNICAL DEVELOPMENT

"Technical development precedes tactical development"

Poor technique (ie. biomechanically inefficient actions) leads to early fatigue, excess fatigue and increased ground contact times. Injury is often a result due to asymmetrical over-

use syndromes. In training a 600m runner the technical model that was strived for hinged on efficient arm and hand actions, trunk posture, knee and foot postures, foot strike and development of an intuitive sense on the part of the athlete of "short levers/fast levers" and the knowledge and will to produce all these actions at will. These goals were accomplished with the following actions.

Daily 50's

Once again this training component was used to underscore and teach the desired sprint technical model. Points of emphasis included arm actions (hand to mouth, side pocket), stepping over the knee, a "knee-up, toe-up" thigh and foot position to activate the stretch reflex of a forefoot strike. These repetitions were not to be done mindlessly but with a mindset to habitually ingrain the desired actions. The fact that these 50's were done at the end of a practice day underscored the importance of mindfulness or focused attention to the task at hand in spite of mounting levels of fatigue.

Hand Position

The famed Australian coach Percy Wells Cerutty taught that correct hand position of a runner should use is with the thumb resting on the middle finger (#3) with the index finger (#2) wrapped around the tip of the thumb. He stated (9, p. 5,16) that this was the position Aboriginal Australians used where they could run endlessly with little effort. Interestingly, emerging research on the fascial sheaths of the body would explain this hand position as tightening the fascial plane of the upper extremity and making its lever action more effective (10). Another explanation is that 50% of one's grip strength comes from the index finger. By activating the grip by wrapping the index finger around the thumb may also activate the tightening of the fascial planes.

Coincidentally the index finger is the only portion of the hand innervated by the three major nerves to the hand; the radial (wrist extension), the median (wrist flexion and finger flexion of #1,2,3) and ulnar (ab/adduction of the fingers). Active involvement of the index finger and hand would allow for a more forceful arm drive as opposed to a "weak" wrist that is evidenced with the flailing arms of exhaustion.

USE OF THE CIRCLE DRILL WILL EFFECTIVELY STRENGTHEN THE FOOT/FORELEG MUSCLES AND ALLOW THE RUNNER TO MORE AGGRESSIVELY RUN THE TURN

3-Step Accelerations

Just as high jumpers or long jumpers must make transitions in their approaches as they shift from horizontal to vertical movement 3-step accelerations were used to teach the runner how to make the transition from "fast running" (i.e., 90% effort) to an all-out sprint in three steps. This is meant to be an explosive, strength and plyometric-type effort. For the runner to execute this technique he must be both physically prepared and cognizant of what constitutes the correct technique. The tactical application of 3-step acceleration is yet to come.

Circle Drill

One of the unique characteristics of indoor track running is the smaller radius of the track. Because of this tighter radius smaller runners have tended to excel due to their shorter stride length. Eamonn Coughlin and Jim Beatty are classic examples.

The problem with the tight turn is really the ability of the athlete's foot to handle the tight turn. A weak foot or foreleg will cause the athlete to shorten the stride length and slow as he is forced to turn with every foot strike. Poorly conditioned foreleg muscles allow the multi-axial subtalar joint (tibio-talar) to "slide" increasing ground contact time and decreasing force application.

Use of the circle drill will effectively strengthen the foot/foreleg muscles and allow the runner to more aggressively run the turn, even for a taller runner. The drill is performed in an area approximately the size of a high jump apron. The athlete runs in a large circle in a counter clockwise direction for one minute. This circle forces the athlete to "turn" on each step while at the same time running with a full running stride. The athlete is allowed to rest for a minute and then the drill is repeated in a clockwise direction.

What is critical to make the drill effective is the arm action used by

the athlete. If the adage is true that "the arms lead the legs" a conscious variation of a symmetric arm action twists the torso and pelvis allowing for a smoother transition around the curve. The arm action cue used repeatedly was, "Inside arm drops back (slightly *behind* the pocket), outside arm crosses over (arm *crosses* the body's midline)."

One-Leg Running

In fact one leg is stronger and faster than the other. There are various tests that can prove this from the simple "Fall Forward" test (fast leg/strong leg moves first to break fall) to the sophisticated Drift Protocol using the Optojump technology. The reason for the discrepancy is that the neural development of that limb is greater. Just as one is right or left hand dominant, one is right or left leg dominant.

While much emphasis by running coaches is on symmetry (which it *should* be) one-leg running can be used to initiate a 3-Step Acceleration or provide drive for the sprint to the finish line. Tommie Smith supposedly utilized this "on-off" technique to win the gold medal at the Mexico Olympics in spite of having to run the final with an injured hamstring.

Jim Beatty called his right leg his "gun" (11) and when the time came to sprint it proved to be a formidable weapon. From a cognitive level this makes sense. There is less to think about and the weaker leg automatically follows through. So while this technique would wreak havoc on the body if used for daily training, when used in these limited circumstances one-leg running can be a technical adaptation that can have a significant tactical impact.

TACTICAL DEVELOPMENT

"Tactical development requires a high level of physical fitness."

It is important to distinguish between tactics and strategies for a moment. Although tactics and strategies are related there are significant differences between the intent and application of the two.

A strategy is a longer period of time. A season plan taking a year or six months to implement may be an adequate timeline. Strategies could include the sequencing of workouts, races and how the athlete could be progressively overloaded over time.

Also included in strategy would be one's philosophy of how the previous sections of physical and technical development will be developed. Questions and attention paid to things such as what inventory of skills need be developed, how will multi-lateral development and anatomical adaptation be handled? Complicating these questions in the fact that age, experience and phase within the season may dictate subtle or even significant mid-course corrections.

Tactics on the other hand represent short-term efforts. What few seem to pay much attention to is that technique is a limiting factor in tactical development. While at first blush this relatedness may not be apparent it is consistent with the pyramid of Bompa's four general concepts.

Tactics as they apply to running involve pace changes that are the result of a change in one's running style (i.e., fast running to sprint actions). It has been discussed that sprint running is energy-wise less efficient because of the more vigorous and explosive actions that this running requires. To expect a runner to "kick" home from 150m would entail sprint technique in coordination with highly developed dynamic stabilizers at the hip (glut medius, adductor group, psoas) and foreleg (posterior tibialis) to produce an effort that is efficient and effective not to mention the physiological qualities necessary to make this all happen.

Yet to produce the sprint effort at the end of a race is the result of a season-long preparation (a strategy) with physical preparation in strength and power along with anatomical adaptation for injury prevention. All these qualities are refined through meticulous technical execution on a regular/daily basis (in this case with the 50m strides).

In a comprehensive training plan tactics and strategies mesh together so that one complements the other throughout the season plan and in all individual training phases.

Make Something Happen

Specific tactics employed included the development of the attitude "make something happen." Every race situation presents the athlete with choices which can be addressed aggressively or passively. Choices require observation, evaluation and a decision. Decisiveness means a measure of control. To "make something happen" develops in the athlete an opportunistic mindset which in turn (ideally) promotes forethought and troubleshooting (i.e., "If this happens, I do…", I can do this…) as opposed to simply jumping to a rash decision.

The development of this aggressive, opportunistic mindset was

critical especially with regards to the Competition Day Plan (how the competition day will unfold) and to a specific Race Plan (what will happen in the race). The use and continued review of race "scripts" (discussed more fully in the psychology section) help to crystallize these two plans and effectively address uncertainty and anxiety regarding "the future." Although no Race or Competition Day Plan is foolproof an additional thought was included for the unexpected, unplanned for event with the thought that, "I'll deal with it."

Lead v. Follow

There are two basic tactics that can be used while running – leading or following. While both methods have their place it becomes critical to the development of the day's Race Plan that the athlete be conversant in each of these tactics.

Leading can be used to push the pace, slow down the pace or run away from the pack. All leading provides a clear running path and theoretically allows one to run the shortest distance legally possible.

DEVELOP THE ABILITY AND CONFIDENCE TO WIN WHETHER LEADING OR FOLLOWING

The advantages to following include drafting off a leader, "setting the leader up" for an unexpected surge, gathering one's reserves for a kick. The downside of following is the possibility of being "boxed in," blocked by other competitors. This can be handled several ways. The fact of the matter is that all boxes break apart sooner or later. If it is a random situation (non-affiliated athletes creating a box) patience and opportunistic actions are necessary to capitalize on open opportunities.

Boxes created by opposing teammates designed to impede competitors skirts the rules of fair play yet still require preparation. This situation is more a problem in cross country, and longer track races such as the 5000 and 10000 meters as opposed to a 600-800m race. In this specific case this problem was not addressed as the early season review of competitors did not include teammates and the qualification procedures for the State Meet would make the qualification of three teammates in the same event impossible.

Learning to Win

Winning is a learned skill. In the GolfPsyche program they speak of the concept of *dominance* (12). The ability to force one's will on a given situation. What became imperative in Josh's preparation was that he develop the ability and confidence to win whether he was leading or following. That being said competitive opportunities needed to be structured so that the athlete was both comfortable leading or following and successful using either tactic.

With the leading tactic the athlete should be comfortable going out hard in an effort to burn off the competition. The half-way split would produce a "positive split" for the race (i.e., second half slower than the first half). This tactic would necessarily produce early fatigue and difficulty maintaining one's form while finishing the race.

Using the "following" tactic the athlete begins the race slowly. This forces the athlete to get used to running in the pack with the jostling and bumping that are inevitable on an indoor running surface. The slower pace will offer the opportunity for "negative splitting" (second half faster that the first half). Inevitably there will be a prolonged kick of 300+ meters in a 600m race. Recording split times for the final 400m, 200m and 100m would be useful to document the possibilities of later race efforts.

3-Step Accelerations

While the 3-Step Accelerations were introduced as a technique consideration the true application of this running would be as a tactic to make a desired pace change later in a race. The success of this tactic hinges on the athlete's cognitive ability to recognize when this tactic should be applied (i.e., shooting through a hole to avoid being boxed) and having the physical strength to execute the move. It is also imperative that the idea of good sprint mechanics be firmly ingrained so that the mental desire to speed up is followed by a clear pattern to follow through with. Finally it should be added that the use of "One-Leg Running" can also be employed to jump start this whole process.

Finish Technique

Were one to ask most coaches what body part "counts" as one crossed the finish line all would say the "torso." But a second question, what exactly constitutes the torso? would leave many with a vague default-type answer that it is where the neck becomes the chest. While this answer is correct it is equally incomplete.

The torso that counts when one dips at the wire in a sprint finish is not only where the neck becomes

the chest but also at the acromial end of the clavicle (the medial side of the acromical-clavicular joint). While many sprinters lean towards the finish line, jutting out the chin, flexing at the waist and dipping towards the wire the first part of the torso to break the finish plane is the manubrium and sternum both at the body's mid-line. It is the well trained sprinter that leads with the shoulder.

The shoulder lean is the more effective sprint finish technique. From a sitting or standing position one can rotate the shoulder forward. Most people's range of motion allows the shoulder to move in an anterior direction (sagittal plane) at least four inches more. Translated to sprinting one has moved 4" closer to the finish line without moving one's feet. In sprinting 4" translates to about 4/100ths of a second.

In both the physical preparation and technical preparation daily 50m strides were recommended. At the end of each 50m the shoulder lean finishing dip was encouraged. Repeat until the action becomes instinctive.

PSYCHOLOGICAL DEVELOPMENT

The capstone of Bompa's Four Global Concepts is psychological development. This is a complex area of development in both content and sequencing of the content that offers multiple, if not countless possibilities for the coach.

To that end one of the great cautions here would be not to overload the athlete. What needed to be established were certain fundamental thought processes and principles that could be reinforced with daily actions and weave their way into the athlete's lifestyle and training cycles.

In this way the psychological development becomes core to the athlete's personality and such topics as self-esteem, problem solving skills, attitudes and behaviors (make something happen) can more easily be laser focused on goal-oriented actions.

Role of the Coach

Over the course of an athlete's career the role of the coach moves on a continuum from the athlete being one among many in the early, novice stages to the coach becoming one among many with the elite athlete.

With a high school athlete he/she is making a transition to a greater stage and with developing maturity making more and more decisions on their own. For the coach there is a shift from a more powerful position to more of a supporting role advisor. Where this becomes problematic is when the advisors become many and with many competing interests. Family, teammates, significant others all can exert self-serving influences on the athlete that may or may not support the cause (refer back to Figure 2). Without a clear lead and a clear plan these competing forces can become destructive.

To prevent this problem from developing clear lines of authority and responsibility need be established early on with an established means for negotiation when an unplanned situation arises so that it can be smoothly resolved with the least impact on training goals as possible.

Scripting

A second critical component that warrants early attention and continual refinement is the use of scripting. A "script" as used here is an ordered "to-do" list that is used for race days, especially the "big" race days.

The point of the script is to develop a sense of control within the athlete so that as the competition day unfolds it is "according to plan" which serves several purposes. A script helps relieve anxiety of the unknown for the athlete. The sense of control it gives reduces the anxiety which in turn allows for feelings of confidence. A third area is that a script helps insure that necessary physiological actions (comprehensive warm-up, proper hydration, bathroom breaks, etc.) are attended to in a timely manner, again giving the athlete a sense of control and confidence.

Ideally a script has at least 75 things that would happen on the competition day. Mundane activities can be included so as to create a full mosaic picture of the athlete's life on that day. As the athlete lives the script he is "making something happen" which is at the core of the athlete's psychological make-up.

Warm-up Routine

The import of an adequate warm-up from a physiological standpoint is indisputable. What is rarely considered is the import of the warm-up from a psychological standpoint. While this may initially seem as two unrelated areas when viewed in this context the design and focus of the warm-up plays a significant role in psychological preparedness.

While the exact components of a warm-up will vary from coach to coach there are several common threads that most coaches would agree on. The use of dynamic

movements, some stretching and stride work are three components of the race day warm-up that would be practiced in daily workouts. Not only does this approach give a solid physical warm-up but it also unfolds as a programmed series of pre-planned movements that addresses the all-important control issues necessary to promote psychological security.

It should be noted that a comprehensive warm-up can take upwards of 30-35 minutes to complete. Easy training days within a microcycle are essentially the comprehensive warm-up. Utilizing this time in this manner reinforces and helps solidify these actions so that their performance becomes second nature on the part of the athlete. All time and efforts come to be seen as important.

Facility Set-up

In ball sports the "home court advantage" is given much press and discussion. But what constitutes a home court advantage? While the idiosyncrasies of each competition venue may differ, even significantly, the things that give one team an advantage is the familiarity with the nuances of the field, facility, crowd, lighting, etc.

In track and field the rules regarding facility construction decrease the variability of one facility to the next. Complicating this fact is that few high schools have a facility that could host state or regional competitions, especially in the Northeast's winter seasons. Because of this most high school invitational and championship events are hosted by collegiate facilities.

In light of this an athlete may only compete at a facility a few times during an indoor season. In order to promote feelings of comfort, control, psychological security and create a home court advantage attention to such factors as racing surface, bathroom location, water fountains, concessions, warm-up areas, meeting spots, healthcare, security, off-limits areas etc. can be reviewed and included in the script for the competition.

IT SHOULD BE NOTED THAT A COMPREHENSIVE WARM-UP CAN TAKE UPWARDS OF 30-35 MINUTES TO COMPLETE

Of particular note should be the track markings, start/finish lines, markings around the track, relay zones, distances between particular markings and distances from the turns to the finish line. The point is to become as familiar with the track facility as one can be. No surprise promotes the desired feelings of comfort, control, psychological security and as it applies to track and field, a home court advantage.

How to Beat a Champion

Dominance, the ability to enforce one's will is one of the eight traits promoted by Deborah Graham in her GolfPsyche program (12, 101-113). Willfulness becomes a trait to be developed and fostered. While we are all willful as two-year olds this infantile mindset will cause more problems than it solves for a competitive athlete. The other problem frequently seen is that some athletes wrestle with thoughts of whether or not this behavior is morally "right." The justification to promote feelings of dominance comes when one revisits the goals of elite sports performance. We are not in a fundamental development or fitness stage but a performance stage where winning and performance excellence are the preeminent goals.

A second point is that the athlete would need to develop the ability to compartmentalize his life. The constant need to exert dominance in all aspects of life (freeway driving, personal relationships, job interactions) would make for an insufferable person and personality. This is where the ability to "shift gears" and assume different mindsets for different social interactions becomes critical.

All champions exert the trait of dominance in their racing. They have mastered the will to win. The difficulty in attempting to beat a champion, especially one who has an extended win streak or strong history of success is that he *expects to win*. It is his default mode. Additionally he does not give up, or fold under pressure. He does not give in. To beat a champion one must physically beat him.

To reiterate, there is no "give up" in a champion. To beat a champion one must physically beat him and prove oneself better at the game.

The Race Plan

The race plan is dependent on the knowledge, skills and abilities of the athlete. As has been detailed the four global concepts have a domino-type effect on the level of sophistication of tactics and strategies a runner may use. Physical conditioning dictates technical expression which in turn dictates

tactical expression.

Regardless of the level of sophistication of the athlete certain fundamentals of a race plan need to be established.

Discussion can begin with a review of previous races and race plans. What has worked and what needs work? While an athlete may be more comfortable with one "style" (i.e., leading or following) attempts should be made to fill out the runner's resume so that the athlete can comfortably compete leading, following, running with an even pace, running negative splits, kicking, etc.

To do this effectively a critical evaluation needs to be made regarding strengths and weaknesses. While it should be underscored that one should "play to one's strengths" efforts should be made throughout the season long race schedule to strengthen one's weaknesses.

The racing styles of opponents should be addressed. Generally high school runners lack racing sophistication in this area and race with the same plan race after race, especially if it has met with success. With long-term preparation this rigid approach to racing can be trained for and possibly used against the opponent by making their greatest strength (a successful yet unvarying race plan) their greatest weakness (lack of flexibility or variability, like Johnnie Gray).

From a race management standpoint it has been helpful to break a race into three parts. For the 600m the race was divided into 300m-150m-150m. The first 300m would be run fast by all race competitors. The next 150m was to be used to settle in, avoid being boxed by of slowing runners and prepare to move for the last 150m which on a 200m track allows for two straight-aways to take a most direct path.

The final component of the race plan is for the coach to instill confidence in the athlete. There is no time on championship days to coach technique. The technical work has been done, the time has come to "do," to make something happen. The automation of actions is as complete as it is going to get and the coach should reinforce with words of encouragement.

CASE STUDY – 2011 NYSPHSAA INDOOR CHAMPIONSHIP

Each winter the state of New York conducts a full indoor track and field meet for high schools throughout the state. The meet has been held continuously since 1972 at a "central" location in the state, usually Cornell University in Ithaca, NY.

The state is broken down into 14 sections (12 public high schools from throughout the state, the Catholic HS league of metropolitan New York City and the private HS league of metro New York City). Each section conducts a qualifying championship with the top two individuals in each event qualifying to compete at the NYS championship, usually one week later at Cornell University.

Within the meet itself are qualifying rounds for the relays (4x200m, 4x400m) and sprint/hurdle distances of 300m and below. Timed finals are used for races 600m and above and for the 4x800m relay.

Significant Players in the 600m – Runner B

Returning in 2011 to defend his upset win in the 2010 600m was Runner B from Middletown, NY. Runner B won in 2010 from the second/unseeded section. He also ran on the 4x200m relay team that placed third at the State Meet. Members of the relay team included his twin brother and two other junior class teammates that would all theoretically return next year to vie for the win in the 4x200. Their time of 1:33.64 splits to an average time of 23.4 per man, excellent times for indoor high school runners.

Runner B began the 2011 indoor season with a stunning NYS record 1:18.96/600m walkover victory at the Bishop Loughlin Games at NYC Armory. The time was significant for several reasons.

1. It was his first meet of the year.
2. Runner B's margin of victory was 1.5 seconds
3. The national high school record (at the time) was less than one second away (1:18.01)

At the same meet Runner B's 4x400m relay team raced to a 3:23.48 time with average splits less than 51 seconds per man.

The remainder of his indoor season was spotty at best and did not fulfill the early promise of the Loughlin Games. In a phone conversation with his high school coach (12/1/15) he stated to me that soon after the Loughlin race Runner B sustained a slight hamstring strain that bothered him for the remainder of the indoor season. While the coach stated that he never fully "pulled" the hamstring although he did complain of a "tightness" that limited his efforts

throughout the winter.

Comment

Runner B's high school program is sprint-based. All his peers are 200-400m runners of some note (especially his twin brother). One could safely assume that the nature of his training was sprint-based, of high quality and of high intensity. The development of his aerobic qualities, necessary to succeed in the shorter middle distances would be suspect as he had no one of his ability on the team to train with. His default training partners would be his 2010 4x200m teammates.

Runner B's 1:18.96 Loughlin win was big news in New York City track circles. To run so fast, so soon in the season indicates a truly dominant individual or one who has incorrectly peaked too soon due to an early diet of high intensity sprint-type work.

Lastly, weak dynamic stabilizers of the hip force the hamstring muscles into the role of stabilizing the hip. Mechanically they do not have the leverage and strain to do this job, leaving the athlete with the sense of "tightness" of the hamstrings even though the hip may have a full range of motion.

Runner A

If *Track and Field News* recognized the top high school indoor track and field athlete for 2011 Runner A would be at the top of a very short list. While Runner B's initial 1:18 effort set a high bar, Runner A's race resume exhibited a consistent standard of excellence unrivaled *nationally* throughout the season.

A first met B in the 400m of the January 8, 2011 Hispanic Games at the Armory. Placing 4th in 49.27 would prove to be one of A's three losses in the 400-500-600-800m distances that winter. Runner A later came back to win the 800m in 1:55.09, a time that was among the national early season leaders.

Other races of note by Runner A included a 1:02.85 500m second place finish January 22, 2011 in a race that produced the current national high school record. Less than a week later came a relay leg at the Millrose Games at Madison Square Garden followed by two stellar races at the high school portions of the Armory Invite with a 6th place 2:30.85 1000m and a first place 1:18.01 600m tying the national high school record.

As the season ground to an end Runner A qualified for the NYS Meet with a Friday night national high school record in the 600m at the PSAL (NYC's sectional championship) Championship in the Armory. That 600m victory was followed in quick succession by an 800m victory in the prestigious Eastern States Championships at the Armory the following Monday. His time lowered his personal best to 1:54.05. He was competing without equal.

Comment

While one could not dispute Runner A's indoor season was incredible and he was a gifted talent head and shoulders above his competition his race schedule proved to be an ever increasing series of high powered, high pressured meets one after the other.

Personal observation and review of races on YouTube revealed that Runner A ran with one basic tactic—to lead from start to finish. He made every effort to break on top, hold the lead until he had "burned off" the competition and coast unchallenged to the finish. It was not uncommon or impossible for him to open with a 51-52 point 400m (two 25-26 second laps) and finish the third lap in the 27-28 second range. Essentially he died from the front.

A third area of critical import was that Runner A's relentless race schedule and his growing celebrity (YouTube interviews) did not allow him to observe the 10-Day Rule. On multiple occasions he produced a superlative effort only to follow-up it up in quick succession with another superlative effort. This fact was most evident when he won the PSAL 600m setting the national high school record and then ran to a personal best three days later in the 800m at the Eastern States Championships. Note that both these efforts were within the 10-day window of the NYS 600m championship.

While Runner A proved to be a remarkable athlete he was also a human being.

Runner C

Runner C entered his senior year of high school with impressive credentials. He had run a 22 point 200m, a 49 point 400m and a 1:55 800m. He had the talent, the range and the motivation to improve.

He first contacted me in November 2010 about the possibility of coaching him. He had the goal to win the State 600m title. Without knowing any of the particulars of the two runners above I felt he had a legitimate chance to accomplish this goal given his speed and range.

Over the course of the next two weeks I put together a season plan to take him from December 1, 2010 right through to the National Scholastic Indoor Meet in mid-March.

A season plan can be a daunting task. Using Bompa's four global concepts I began to crystallize how I would physically prepare Runner C for the tactics I felt would be necessary to succeed at the championship level. I also started to consider how best to develop and foster psychological qualities that would steel his resolve throughout the course of a season and through the inevitable unforeseen circumstances that can create doubt and blur focus.

One thing my early research revealed was that Runner B would likely return to defend his title. His 800R work, coupled with the fact that his unseeded section win was seen by some as a "fluke" would give him motivation to prove himself and make him a formidable opponent.

While I set out the daily workouts Runner C's high school coach reserved the right to dictate his race schedule. While not ideal it was a necessary compromise. The only thing I asked for was to know the race schedule two weeks in advance.

Runner C and I settled on a weekly Sunday night phone calls to review the past week's training, review any race efforts and discuss the future. He was aware of the four concepts and the components of each to the point that eventually phone conversations could quickly scroll through the desired points.

As the season progressed and the race schedule presented I tried to use each effort to make him comfortable with a racing tactic so that by February 15 he had the ability (and comfort level) to lead, follow, use the 3-step acceleration, close fast, maintain form when tired and maintain focus under stress.

In that the Cornell track was essentially his "home" racing facility one of his assignments was to know the facility "inside and out." Included in this were not only the location of the bathrooms and water fountains but also which ones were more popular and had the longest lines. Also on the list was note of the warm-up areas, the PA system and how things are announced, ins and outs of the building and the track itself. Of particular note was to know the different track markings, the mile start, the relay zones, the color of the different lines and the distances between the different lines. We also discussed how long it took to cover those distances. Of particular concern was that he develop a sense of "how far" two seconds was on the track.

I WOULD PHYSICALLY PREPARE RUNNER C FOR THE TACTICS I FELT WOULD BE NECESSARY TO SUCCEED AT THE CHAMPIONSHIP LEVEL

His season began well with a 1:22 600m on a flat floor wire-to-wire win at Cornell.

Runner C was invited to the Armory Invite to compete in the Invitational 600m and race A head-on. The race goal we set was more to "lie in the weeds," be there but be invisible. I wanted C to get the feel of how A ran. With over 100 college coaches in attendance A had all eyes upon him. True to form he broke on top, led wire-to-wire and coasted home in 1:18. Runner C ran a fast race placing 4th in a personal best by nearly two seconds in 1:20. He had executed his race plan successfully and saw that Runner A did run as predicted, bull his way to the front and run away with the race. I also wanted A to see C as not a potential threat, just someone he would routinely beat with a solid effort.

The Thursday Night Phone Call

My final contact with Runner C was the Thursday night before the Saturday State Meet. I called to review three important points, not to belabor the points but rather to reassure him that we had done the training as planned and that he was ready. I wanted to coach confidence, not technique.

What was reviewed from my notes was: 1. The race plan; 2. The pre-race warm-up; 3. How to beat a champion.

1. The Race Plan

In quick order I reviewed how I felt the race would unfold. I reminded C that championship races tended to be more tactical than producing great times, but added that he was ready for a sub 1:20 effort if necessary. I expected both B and A to intensely focus on each other and disregard him and everybody else. Because of this they would battle each other from the front with each vying for the lead early on as they were both habitual front runners.

I noted that there was not another entrant in the race who had broken 1:22 so it would be essentially a three-person race, especially on the last lap.

Runner C was cautioned NOT to attempt to race with B or A for the first 400m as their "early speed and fade" tactic was not how he was trained. His patience was a key to success.

I told him to have a very clear idea what constituted 15m on the Cornell track and reiterated that if he was within 15 meters with a lap to go he had the closing speed and strength to win. Fifteen meters with a lap to go may seem like an insurmountable distance but with his competitors race history and his previous race splits he had the ability to win.

2. Pre-race Warm-up

In spite of all the training, all the drills, all the preparations on and off the track I reiterated that the scripted warm-up should have him thinking this was "just another race." I wanted Runner C to capitalize on the fact that he had raced at Cornell several times and that each time we had used a scripted warm-up that allowed for the heightening of the physiological systems along with the focusing of his psychological qualities.

This day, today was not to be any different. He was to "go about business" as he had before, no changes, no experiments. Get warmed up, stay hydrated and set your mind that you are going to run fast.

3. How to Beat a Champion

The final point I made was aimed at focusing C's will. I told him that one of the things B and A had in common was that they were champions. They view the world from an entitled position and due to their history of successes they both expected to win. I told him he had been trained over the last 90 days to have the tactical skills and physical qualities to compete with anyone. I mentioned that neither B or A would "lie down and quit." To beat them Runner C would have to ***beat*** them. The force of one's will.

C'S PATIENCE WAS A KEY TO SUCCESS

My final point was that I felt for Runner C to have a chance to win he had to come into the stretch even with B and/or A. At that point the race would be a force of will(s). All the drills we had done daily in practice, the movement techniques he had honed in practice and under competitive conditions would come into play—one-leg running, hand positions, arm drive, sprint mechanics, finishing dip would all come into play.

I told him he had done all these actions countless times and that these actions were automated into his technical execution of the running action.

Runner C had two concerns. His Sectional Championship had been snowed out so he was not to have raced in two weeks and we lost the chance for any sharpening efforts. I told him to be content that he would be well rested. Secondly he expressed concern that A had set the national high school record the Friday before. While I admitted it was a great effort I reminded him that Runner A had violated the 10-Day Rule, that he was human and that he still had to run "this race." I told C "to challenge him with your best effort" and focus on *your* race plan. When I asked if there was anything else I could do for him he answered, "No." I thanked him for his efforts, told him I was excited about the possibility, said good-bye and hung up the phone.

VIDEO ANALYSIS OF NYSPHSAA 600M CHAMPIONSHIP RACE, MARCH 5, 2011

The race video can be accessed through YouTube under the title "Boys 600m" by Armory Track. Please note that the race gun start happens about 17 seconds into the video clip. Because of this the timeline of significant race events has the 17-second time differential.

0:17 Race start – A in lane 4, B lane 5, C lane 6…note "false start" by A and the "step back" foot placement to regain balance.

0:29 A makes up staggered start on B approximately 100m into race

0:39 Cut in break with A and B following the early, panicked leader

0:43 End of Lap 1…25 second first lap . . . Runner C is in 6th place

0:57 300m mark…early leader (purple) dies off…A to the lead, B second, C 5th place

1:05 A, B, C 1,2,3 into the front stretch

1:10 End of Lap 2 (approximately 52 seconds for leader) A, B, C . . . **Runner C is about 7 yards behind** . . . Note that the race plan called for him to be within 15 yards . . . the emotional lift would be from "I am third" to "I can win."…make something happen

1:11-15 Note arm action around turn . . . inside arm drops back, outside arm crosses over

1:19 Top of back stretch . . . A, B, C . . . Runner C initiates 3-step acceleration and catches B before the turn

1:24-26 C passes B on the turn

1:33 C even with A at top of the stretch

1:35 A pulls ahead, then falters

1:36 Runner C pulls even with Runner A

1:38 C pulls ahead

1:38 (late) A begins to dip early (note back leg and trunk lean) . . . C's head begins to lower

1:39 Runner C dips leading with right shoulder—time 1:20.75… Runner B surges for second—time 1:20.80 . . . A finishes third—time 1:20.87

Every Picture Tells a Story

1. Note the shoulder dip
2. Cerutty's hand grip
3. Loss of arm drive, note open hand
4. Foot splay = weak hips, weak dynamic stabilizers

SUMMARY

Every great athlete makes his or her coach look like a genius. It is a reality that can be admitted or ignored but the reality is all the steps that "fell into place" could have just as easily proven to be catastrophic missteps that derailed great potential.

I purposefully avoided discussing specific workouts (i.e., 6x 200m at xx) opting to discuss the construction of a season long approach that integrated Bompa's Four Global Concepts. I was fortunate to work with an athlete who possessed the physical skills to meet the challenges I put forth, his schedule presented or his competition created. Runner C also possessed the cognitive skills to comfortably integrate "new ways" into his training plan in spite of important others' skepticism or doubt regarding some of the unusual, even unorthodox suggestions that were made.

Successful coaching is a true synergy between the coach and the athlete. The coach may have the knowledge, wisdom and experience to know what to do and when to do but necessarily there must be a transfer to the athlete whose job it is "to do."

Sir Isaac Newton is credited with summarizing his accomplishments by stating, "I stand on the shoulders of giants." Without the contributions of my Soviet professors, Tudor Bompa, Vern Gambetta, Yuri Verkhoshansky and numerous fellow instructors within USATF's Coaching Education I've come to know over the last 30 years none of this would have happened. I am pleased to have helped Runner C achieve a lifetime experience he will never forget, and that goes for me too.

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FALSE FEEDBACK FAILS

The author stresses that undeserved or unrealistic praise hinders rather than helps athletic development.

BY ALLISTAIR J. MC CAW
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In the coaching industry, they speak about the 5 to 1 ratio of giving positive feedback to negative, when dealing with athletes or kids.

Personally, I go with about a 3:1 ratio. Not because I'm "less positive," but because we need to be realistic and give the right kind of feedback that improves the athlete, not just their egos. Too many compliments in my opinion, is not the healthy or effective approach.

When I share feedback with an athlete, it usually centers around these three things:

1. The timing of it.
2. Feedback based on the facts with proof.
3. Feedback that is honest (nice or not).

In my opinion, there is nothing more detrimental than seeing a coach or parent tell a kid he had a great game or race, when in fact he didn't.

Now, I completely understand the importance of building confidence in the athlete, but that athlete needs to know what is honestly helping his or her progress, and what isn't. Constantly shouting "*Good job*" when the fact of the matter was that it wasn't really a good job doesn't help and this kind of feedback fails in the long term.

It simply sends a false message to the athlete or child, because after a while they don't know when they actually have done something really well or not. They begin to become skeptical of your praise.

The most important kind of feedback is honest feedback. Realistic and straight feedback that helps grow and improve that athlete or child. You don't improve with criticism, but rather you improve with the right kind of feedback.

Parents telling their kids that they are the best player on the team or squad (even if they are!) doesn't help the process and development path for that child. This is teaching a fixed mindset, where the child begins to think that he rocks and doesn't need to work hard.

This kind of feedback is what I call "flattering feedback" which only hurts the learning and development process, more than it helps.

An athlete who scored three goals for his/her team that day doesn't necessarily reflect the effort given. If he just stood around waiting for the pass to just shoot the puck or ball into the net, then praise might

(Continued on page 6870)

DEVELOPING AN EFFICIENT DISCUS MODEL

Breaking down discus throw movements is an important part of creating a throwing model based on a stable vertical axis. This piece is reprinted from *Long & Strong,* January 2010.

BY MIKE MAYNARD, DIRECTOR OF TRACK & FIELD/CROSS COUNTRY, UCLA

The discus throw allows for a wide range of individual expression of the technical fundamentals. Current successful technical expressions of the discus cover a wide variety of styles and philosophies of throwing. The physical parameters of successful discus throwers, on the world stage, indicates the necessity for well above average size. For example, world class male discus throwers tend to be about 1.95m/ 115kg (6-4¾/254lbs.). However, exceptions to these physical parameters readily exist on both the national and world levels. The athletes who comprise these exceptions typically compensate for physical deficits with a particularly exceptional specific physical talent(s), and/or an exceptionally well-adapted technical model.

The dynamic nature of the discus movement has historically witnessed a variety of successful technical expressions. Many of these utilize large and sweeping movements to accomplish mechanical advantage within the throw. Those technical models will continue to be successful. The technical model should seek to maximize the athlete's particular physical attributes (i.e., system of levers, range of movement, biomotor capabilities). **The technical model to be presented and discussed in this article is meant to pare down the movements of the discus thrower to a bare and essential minimum.**

The objective in restricting the variables of the technical movement within the discus model is meant to create a system of throwing which is efficient and easy to replicate as a model. The efficient technical model promotes consistency of expression via repetition, faster progression toward habituation of movement, and offers the opportunity of lower degradation of the quality of movement due to competitive stressors. In addition, this type of model can offer coaches a simple and precise task-oriented teaching progression. The

successful lowering of the minimum physical parameters necessary for high level success, offered by an efficient technical model, may also offer coaches a greater population with regard to athlete selection.

ESTABLISHING SYSTEM AXIS

A key and central element of the technical model being presented is a stable and consistent axis of the thrower-implement system. This system axis must be established and maintained throughout the throw. Athlete posture is the basis of this efficient dynamic axis. **The development of an efficient axis can be accomplished by stabilizing the trunk axis in an upright posture with the hips tucked under the athlete during the preliminary wrap of the discus.** This vertical posture should be maintained throughout the entire throw, with the exception of the axis tilt in the power position.

Coaching Cue: The coach should introduce, and consistently cue, the athlete to maintain an erect posture with the hips stabilized and tucked underneath throughout the learning process. Posture precedes balance. The objective of establishing this axis is intended to minimize head radius of the athlete throughout the entire movement. The error of excessive lateral deviation of axis is best observed when viewing the athlete from the back of the circle and towards the throwing direction, or 180 degrees. The goal is to minimize any lateral deviation (i.e., wobble) of the axis. This stable and efficient axis allows forces imparted to the system, such as the push in the direction of the throw off the single support base out of the back of the circle, to result in a corresponding increase in forces available to be applied to the discus during the delivery phase. If the axis remains efficiently stable, the treatments of the free leg, drive leg, and CMT displacement, can be organized to create effective resultant forces for the discus delivery. An efficient system axis allows for effective maintenance and use of separation/ torsion, in the form of stored elastic energy, within the throw delivery.

PATHS OF CENTER OF MASS

An additional technical goal of the athlete during the discus throw should be the creation and use of dynamic / directional displacement of the center of mass. **An efficient technical model should seek to align those forces generated parallel with the intended direction and angle of projection of the throw.** This aim should be achieved while creating a dynamic and specific directional balance of the thrower-implement system about an efficient axis. Direction, paths of the thrower/implement system, and angle of implement projection should be taught early and often within the teaching progression of the discus throw.

Paths to be covered should include the paths of Center of Mass of the Thrower (CMT) and Center of Mass of the Implement (CMI) and with intended angles of projection and orbital considerations. Development of the awareness of these paths by novices, early in the learning progression, can be effective in the development of spatial and kinesthetic awareness of the athlete.

At the outset of the discus movement, the transition from double support to single support necessitates a shift of the CMT toward the single support base. The degree of this shift over the base of support is relative to the degree of Center of Mass displacement / counter in the direction of the throw (i.e., hip counter). In order to create an effective throwing direction the necessary path of the CMT is roughly as follows (see Figure 1).

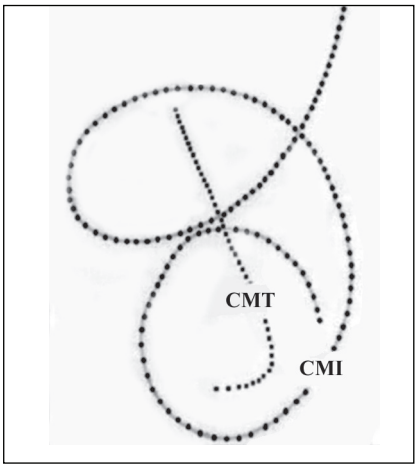

FIGURE 1

ALIGNMENT OF FORCES

The actions of the swing/ free leg and the push-off of the drive / support leg aid in establishing the intended path of projection of the implement. The CMT and the forces established by the swing/ free leg and drive/ support leg out of the back of the circle combine to create a resultant which is ideally parallel to the discus projection path.

Those forces should be directed as closely as possible to align with both the intended angle of projection, as well as the directional path of the implement. The direction of the push out of the back of the circle should be aligned with the path of the CMT (see Figure 1). The push direction may require modification, due to the actions of the free/swing leg, so that the resultant system direction is accurate to the intended

path. Reduction of deflected forces makes it easier to apply those forces generated during the throw into an efficient delivery sequence. This efficiency of movement offers either higher performance for a given level of forces generated or equal performances with less force required, relative to a less efficient model of throwing.

The discus orbit is a resultant of the system axis and the forces applied to the thrower-implement system. The push-off of the first single support establishes the direction of CMT, as well as the pitch angle of the orbital plane. When viewing the throwing movement from 90° to the side in the throwing direction, the angle of the push off of the single support leg should be applied parallel to the desired angle of projection of the implement (see Figure 2).

Coaching Cue: Single support push angle alignment can be determined by checking to see that the angle of the lower leg (tibia) is parallel to the angle of projection of delivery, when the athlete executes the push out of the back of the circle (see Figure 3).

The discus orbit should be symmetrical. A symmetrical orbit is evident when the implement is neutral, relative to horizontal, at both 90 and 270 degrees. There should be minimum yaw of the orbit on the longitudinal axis. Applying forces within a symmetrical orbit aids the efficiency of the thrower-implement system upon delivery.

Coaching Cue: Orbital mistakes, such as late high point or "scooping," should be addressed by developing proper axis, and proper alignment of forces with regard to both direction of CMT and angle of projection.

SEPARATION AND TORSION

Separation and torsion are distinct skills that are required in the discus throw. **The elastic energy that the combined movements of torsion and separation provide serves as the primary engine for the acceleration of the discus in the delivery.** A technical model that stresses the maintenance of an efficient axis offers the athlete the ability to maintain and utilize separation and torsion to a higher degree.

Coaching Cue: Torsion can be defined as the positive angle, or space, created between the hip axis, and the trailing end of the shoulder axis. Separation can be defined as the positive angle or separation of axis between the shoulder axis and the throwing arm axis as it extends through the CM of the implement. For the purposes of this article, and to better delineate between the aspects of these energy storage systems, the term total lead/space will be used to define the cumulative amount of torsion and separation (see Figure 3).

SEPARATION & TORSION

In the case of each of the skills of separation, and torsion, the thrower can pre-stretch the agonists, and thereby facilitate and maximize the storage of elastic energy. In addition to creating the ability to exploit the stretch reflex, the throwing side arm/lever, and trunk, range of motion is maximized through these movements. Proper delivery timing will generate the conditions optimal for the efficient summation of forces and delivery sequence.

SEPARATION

When properly executed, both separation and torsion offer the thrower an opportunity to maximize biomotor and mechanical components of the throw. Separation can be

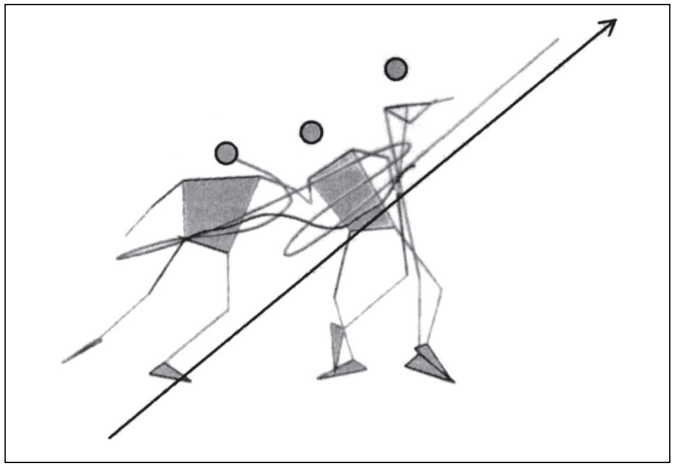

FIGURE 2

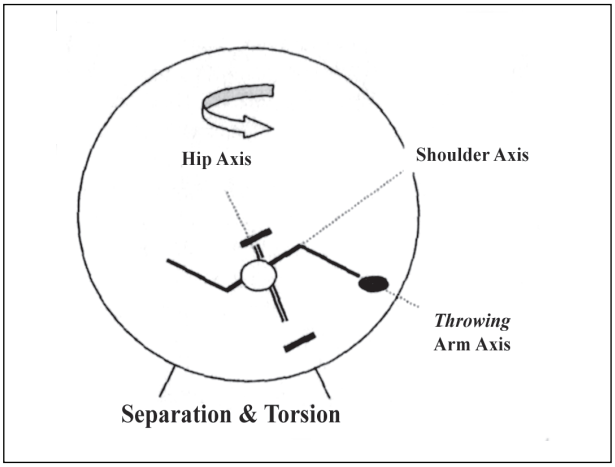

FIGURE 3

achieved if the athlete contracts the triceps, and cocks back the throwing side shoulder. The contraction of the rear throwing side *{antagonistic)* musculature causes a relaxing of the chest deltoid area *{agonistic)* musculature that increases both the range of motion of the throwing arm lever, and the storage of elastic energy.

Coaching Cue: The coach should introduce, and consistently cue, the athlete/thrower early in the learning process to actively contract the antagonistic to the throwing side musculature. Active cues such as "squeeze the backside muscle," or "cock & lock" the rear shoulder and inside head of the triceps aids in maximizing separation. Lowering the throwing side arm increases range of motion and contributes to proper discus tilt on delivery.

Over time and as throwers progress in the skill of creating and maintaining separation, it is likely that passive cueing of the skill of separation can be used. This is especially true for those throwers who have gained stabilization of the skill. The passive cueing of separation would be achieved by instructing the thrower to relax and leave the discus trailing behind the system during the movement as far as possible. The goal of this passive cueing is meant to maximize the total lead in the system.

National and world-class discus throwers can at times lose their separation levels during high intensity throws. The most common cause of this fault is related to an inefficient axis. The problem can also be the result of an especially effective push-off of the single support/drive leg out of the back of the circle. The stretch created by an effective push creates stretch through the chest and may cause the discus to "bounce" forward, thus creating slack in the system. While the creation of this negative separation is not a goal of the technique, the cause can be a positive sign of the effective translation of force to the thrower- implement system. The skill of regaining position and the necessary separation level with the corresponding elastic energy can be taught through effective use of drills.

Coaching Cue: The Cast & Catch style of the South African drill can be effective for this purpose. This drill can be practiced with balls, puds, pipes, or just about anything that would typically be thrown in training. It may be advisable to use the standard style of South African drill, with a constant total lead, when throwing the discus as the primary drill. This will reduce confusion within the athlete regarding the differing goals between the drills.

The lack of separation of the throwing arm axis relative to the shoulder axis can be simply described as "slack" in the system. Slack becomes evident to the coach by observing the relationship between the throwing arm axis relative to the shoulder axis. A negative separation angle is easily noted as the discus seems to lead the thrower as the thrower-implement system moves in the direction of the throw toward the orbital high point. **The negative/neutral separation angle effectively inhibits the opportunity for the thrower to impart any force to the implement until the slack is removed from the system.** If the separation angle is reduced to any extent, during the conclusion of the first single support or non-support phase, it should be regained prior to the re-contact of the second single support in the center of the ring.

TORSION

Torsion can be defined as the positive angle, or space, created between the hip axis, and the shoulder axis (see Fig. 4). Torsion affords an opportunity to store elastic energy in the torso of the thrower for use during the delivery sequence. The counter wrapping of the free arm in non-support can be an effective means of re-establishing and maintaining torsion. **Actions of the free side arm and shoulder, when combined with active counter rotation and contraction of the torso musculature, will maximize the torsion level between the shoulder axis and the hip axis.** It is possible to establish a torsion position upon the preliminary wrap of the discus movement by "setting" the left shoulder inside the left hip in the initial wrapping movement of the throw. Some athletes are sensitive to the tendency of this early torsion to somewhat inhibit rotation within the throw. However if the axis is efficient, then additional rotational forces can be added via the swing/**free** leg inversion, as well as shortening the free arm, to counteract this inhibited rotation. An early establishment of torsion greatly reduces the opportunity for later mistakes that may result in the loss of torsion.

Coaching Cue: The torsion position can be set from the back of the circle by setting the shoulder axis behind and inside the leading side hip axis. Cue the athlete to hold this left shoulder inside the leading side hip until delivery sequence is initiated. Free arm can aid in re-establishing torsion in non-support by casting it in a subtle counterwrap motion.

SECOND SINGLE SUPPORT

The second single support contact phase is a critical phase within the throw, because it represents a major opportunity for the loss of angular velocity of the implement due to thrower-implement system friction. This friction tends to reduce the separation/torsion level via system deceleration. The loss of separation can be avoided if there is an active cueing of squeezing the throwing side arm/shoulder back to maintain separation level. This can be achieved by cueing the contraction of the antagonistic/ backside musculature, and/ or an active inversion, or pivoting ahead, of the second single support side both prior to and subsequent to the second double support re-contact (i.e., left foot re-contact for a right-handed thrower).

The loss of angular velocity of the thrower-implement system, due to the second single support friction, can also be mitigated by reducing the time between the second single support contact and the second double support contact. Delaying the re-contact of the second single support in the center of the ring will reduce friction, and shorten the time interval between the second single support contact, and the second double support contact (i.e., the time between right foot, and left foot touchdown for a right-handed thrower).

This delaying of the re-contact of the second single support foot can be accomplished by lifting the knee of the swing/free leg (right leg for a right-handed thrower) during the nonsupport phase following the swing invert action. The re-contact of the second single support can also be delayed by the active dorsiflexion of the swing leg foot. These movements serve to delay the re-contact and shorten the time interval between single support and double support. They also have the added benefit of creating knee flexion and an ankle lock position which aids in the storage of additional elastic energy in the leg for use later in the delivery sequence. The re-contact of the second single support should be with the foot axis oriented at, or around, 315 degrees. However, a case could be made for delaying re-contact even later to reduce the negative impact of friction on implement velocities.

Coaching Cue: The athlete should be instructed to turn in the air, not on the ground. The desired angle of the foot axis upon re-contact of the second single support should be approximately at 315 degrees. It is important that the thrower does not stay on the first single support beyond the line of direction of the CMT out of the back of the circle. This error leads to the technical fault of “overrotation” and results in a poor heel tuck/heel recovery on the drive leg.

TILT OF AXIS IN POWER POSITION

When observing the axis of the system, from the perspective of 90 degrees in the throwing direction, there should be a tilt of the axis away from the throwing direction when the athlete is in the Power Position (see Fig. 4). However in order to maintain effective summation of the system upon delivery, there should still be minimal deviation of the axis (i.e., head radius) in the system axis. The axis tilt aids in establishing the angle of projection of the implement. The axis tilt maximizes the force path of the implement, and thereby the opportunity to impart forces in the delivery of the discus. In addition the axis tilt delays the transition of the CMT in the direction of the throw, which results in a more effective use of forces generated. The tilt/ orientation of the axis is achieved during the nonsupport phase of the throw. As the free leg is inverted, and lifted, a center axis of rotation is established. The free arm, and shoulder, is counter-wrapped away from the direction of the throw. This wrapping of the free arm side maximizes torsion between the hip axis and shoulder axis, and initiates the tilt of the axis away from the throwing direction. The lower body travels toward the front of the circle, and the tilt is complete. The tilt of the axis is relative to the desired angle of projection of the implement, and the technical proficiency of the thrower (i.e., throwers with greater technical mastery can achieve and utilize a greater axis tilt).

Coaching Cue: During the learning phase athletes should be instructed to maintain a more erect vertical posture throughout the throw until technical mastery allows the use of greater system axis tilt. Axis tilt should be introduced as the novice

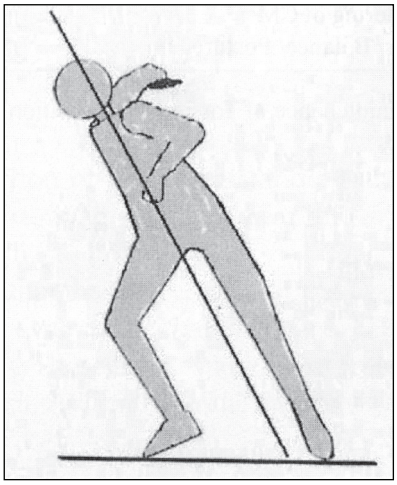

FIGURE 4

thrower becomes more adept at achieving the fundamentals of the standing throw position.

COACHING CONSIDERATIONS

Teaching progressions should be based on task/skill identification and should develop the athlete toward mastery of necessary skills. The coach should seek to create specific learning periods with an objective emphasis towards specific skill acquisition. The process of skill introduction should follow the following process:

Coaching Cue: Repetition of an introduced movement creates a learned movement. Stabilization of a learned skill occurs through repetition of the learned movements. Habituation of a movement skill occurs through repetition of stabilized movements.

- Introduce the skill
- Drill the skill
- Instill the skill (via repetition)

The goal of the teaching progression should be to move motor skills along the continuum from learned movements to habituated skills/ movements. Related/ parallel movements and task-oriented drills should be used, in conjunction with cueing within the throw, to aid in the learning progression of identified skills. For the aid of developing an appropriate skill progression the following is a non-exhaustive list of skills related to the discus technique:

Task/Skill Identification

1. Double Support Axis/ Balance/ Posture
2. Hip/Pelvis stabilization
3. Pivoting in Single and Double Support
4. Transferring/Countering of CM
5. Single Support Axis/Balance/ Posture
6. Use of Focal Points
7. Establishing and Maintenance of Torsion & Separation
8. Free Arm Mechanics
9. Swing/Free Leg Actions
   a. Sweeping
   b. Inversion
   c. Knee Drive/Lift
   d. Dorsiflexion {ankle lock)
10. Drive Leg Actions
    a. Sprint/Push
    b. Heel Tuck/Recovery
    c. Adduction
11. Maintenance of position Axis
12. Balance/Posture during Non-Support Rotation
13. Re-contact Stabilization
    a. Single Support
    b. Double Support
14. Effective Transfer of CM
15. Use of Torsion & Separation in Delivery Sequence
16. Blocking Mechanics
    a. Upper body
    b. Lower body
17. Recovery Mechanics

SUMMARY

It is possible to pare down the movements of the discus throw to an essential minimum. The creation of a throwing model based on a stable vertical axis is an important part of that endeavor. Such a model may promote consistency of expression, faster progression toward habituation of movement, and lower degradation of quality of movement due to stressors. A stable system axis allows for maintenance of increased levels of torsion and separation, as well as promoting the effective use of the elastic energy stored in the torso. In addition a stable system axis will aid in maximizing the utilization of properly aligned forces for the delivery sequence.

FALSE FEEDBACK FAILS *Continued from page 6864*

simply be rewarding the wrong things (rewarding the result, not the effort).

Kids need confidence (like all of us), but that can be developed in other ways, e.g., us showing them what they did do well and giving them examples.

It gets back to this: Did your athlete or child give his best effort? Did he shows the traits of a great player (not skills-wise), but character-wise—That's what counts most.

What we need is constructive, honest and well-timed feedback delivered in a positive manner.

Remember that effective communication is 80% how it is delivered or presented and only 20% the actual message.

One commonality of the best athletes I've worked with is that they all handle feedback and criticism well. In most cases, their upbringing mirrors this quality from the way their parents and teachers have offered it.

False feedback fails. Rather provide feedback that results in genuine healthy long-term success.

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He can be reached at www.mccawmethod.com

USATF COACHING EDUCATION

2016

Level 1 Schools

May 21-22	Allen High School – Dallas, TX
May 28-29	Cerritos College – Norwalk, CA
June 4-5	Sylvan Hills High School – Little Rock, AR
June 10-12	Atlantic Sports Health – Morristown, NJ
June 11-12	Renaissance High School – Detroit, MI
June 17-19	Benedictine University – Lisle, IL
June 18-19	Crossfit/Personal Sport Performance – Longwood, FL
June 19-21	UNC Greensboro – Greensboro, NC
June 27-28	Stillwater Senior High School – Stillwater, MN
July 15-17	Nassau Community College – Garden City, NY
July 15-17	Ironwood Throws Facility – Rathdrum, ID
July 16-17	Edmond Memorial High School – Oklahoma City, OK
July 22-24	Savannah State University – Savannah, GA
July 22-24	Johns Hopkins University – Baltimore, MD
Aug. 6-7	Highline Community College – Seattle, WA
Aug. 13-14	Roosevelt High School – Des Moines, IA
Sept. 30-Oct. 2	Community College of Philadelphia – Philadelphia, PA
Oct. 14-16	Benedictine University – Lisle, IL
Nov. 12-13	Allen High School – Dallas, TX
Nov. 12-13	Cardinal Stritch University – Milwaukee, WI
Nov. 18-20	Eastern Michigan University – Ypsilanti, MI
Nov. 18-20	Johnson & Wales University – Denver, CO
Nov. 19-20	Tennessee State University – Nashville, TN
Nov. 19-20	Christopher Newport University – Newport News, VA
Nov. 26-27	UNLV – Las Vegas, NV
Nov. 26-27	TBA – Kansas City, MO
Dec. 9-11	Westerville South High School – Westerville, OH
Dec. 16-18	Public School 9 – New York, NY

Level 2 Schools

July 18-23	Marian University – Indianapolis, IN

Level 3 – USA Track & Field Licensed Courses

Online	Advanced Training Theory Course
April 29-30	Healthy Running Summit – San Luis Obispo, CA

Podium Education Project – International High Performance Symposium

Nov. 30	TBA – Orlando, FL

USA TRACK & FIELD — REQUEST FOR PROPOSALS SPORTS SCIENCE & MEDICINE

USATF's High Performance team has issued a request for proposals (RFP) for sports science and medicine programs to be included in USATF's 2017-2020 High Performance Plan. This plan receives funding support over the next quadrennium.

The call for proposals is open to all, including the greater U.S. Sports Science & Medicine community, university and private researchers, technology developers, coaches, athletes, and the USATF community at large. Proposals must be specific to a Sports Science or Sports Medicine related concept. While the USATF High Performance Plan will include a number of specific objectives, the primary goal is maximizing medal attainment at the Olympic Games and IAAF World Championships events.

USATF has identified the following Sports Science & Medicine priorities for 2017-2020:

- Keeping athletes physically and mentally healthy
- Identifying limitations to elite performance
- Biomechanical, nutritional, and physiological interventions that could enhance performance
- Use of technology to monitor athlete responses / training loads
- Development of informational repositories for coaches and athletes
- Maximizing strength development and recovery
- Optimal timing and date selection of the U.S. Championships or Olympic Trials, in relation to the World Championships or Olympic Games, in order to maximize performance
- Scientific or medical barriers to the successful transition from collegiate to professional track & field

For more information on the RFP, including information on the submission process, please email Robert Chapman, USATF Associate Director for Sports Science and Medicine: **Robert.Chapman@usatf.org**.

Coaching Stipends: Tier 1 and Tier 2 USATF athletes qualify for a coaching stipend, paid directly to their coaches to support their training efforts. The objective of this program is to support those coaches who are producing medal-contending athletes. Stipends are $2,000 for Tier 1 athletes and $1,000 for Tier 2 athletes; coaches must be current and registered in the USATF Coaches Registry. For more information, email Beka Suggs: **Sariyu.suggs@usatf.org**.

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