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L-R: USATF President Vin Lananna, USATF CEO Max Siegel,
2021 Legend Coach Award recipient Bill Dellinger, and USATF Coaches Advisory Committee Chair Kevin Reid

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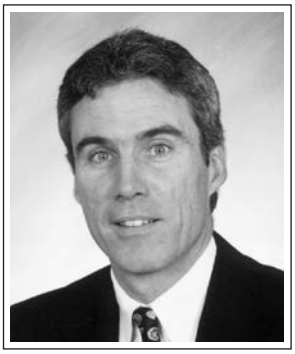
FROM THE EDITOR

RUSS EBBETS

ALL THE WORLD'S A STAGE



When Aristotle sat down to write the rules of drama some 2500 years ago, I doubt he gave much thought to relay racing. His Poetics has been used by writers and authors since that time to construct plays, movies and television programs that have entertained millions and millions of people worldwide.

But if one were to somehow get Aristotle to attend the Penn Relays on a Saturday afternoon in late April for an hour or so I think he'd be asking to borrow someone's cell to send a text back to his teacher, Plato with the short note, "I have a new idea."

According to Aristotle a dramatic production consists of six things: spectacle, characters, plot, melody, diction and thought.

Right off the bat the Penn Relays has spectacle. Whether one is talking about the street vendors, Franklin Field, the crowd of 50,000+ rabid fans, the cattle call of the bullpen or the seemingly endless race after race of talented athletes that generate the sights, the sounds and the swirl of colors that becomes more than any scribe could ask for.

The characters are countless but there are some that stand out with heroic deeds. The early press, a program or a neighbor's overheard chatter can spark some remembrance of a previous performance or foreshadow which characters warrant greater attention. Uniforms and sweat suits also can give a clue. And for the athletes themselves there is always the quiet recognition of a head turn or nod that acknowledges special status.

The plot would be pretty simple. Something everyone "gets" in a matter of moments. Four people, each runs individually, and they hand off the stick. Initially simple and straightforward. But the plot does "thicken" when one starts to mention tradition, win streaks, records, rivalries, challengers and how the individual teams deal with the struggles of the elements – the sun, wind, rain, the track that can all complicate choices and present unforeseen obstacles that beg the question – just whose side are the Gods on today?

Melody is a harmonious sound. The soundtrack at Penn is noise, the cackle of thousands of voices pointless and discordant. But the action on the track focuses

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EDITORIAL COLUMN

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the sound for the momentary hush of a race start to the adrenaline rush of the woo-woo birds to the final breathless finish. An acquired taste? Easily.

In the end there is thought. This is a time of consideration and contemplation of what has happened. The thoughts might be awe, inspiration or admiration. They may offer the example of perseverance, drive or dedication that inspires the audience to emulate, especially for the young. For the old it may generate a time of reflection, a wistful time of pleasant memories of days gone by.

Diction is the stretch. No one enunciates when they are running fast. It's not that one can't, it's just that one doesn't. And with the set-up of the stadium, who is going to hear what gets said anyway? Profanity and guttural grunts do little to move the storyline forward. But given a quieter stage and a time to reflect, be that time years or even decades, the characters would have something to say, something that would illuminate and be of import to fans and fellow competitors alike.

The success Villanova University has had at the Penn Relays over the last 50 years is legendary. The names of some of the characters/runners are woven deeply into the fabric of that event and even the sport itself. From 1966 to 1981 Villanova had a remarkable streak of 16 consecutive distance medley relay victories against all comers. Year-in, year-out the result was the same, even though the cast of characters changed regularly with graduation after graduation.

Jerry Bouma, a long ago teammate of mine, is writing a book on that streak. Together we have gathered some of the "characters" that made for those successful races. Lest one think this is a simple trip down Memory Lane these are all four-minute milers, who won 32 individual IC4A championships, 22 individual NCAA champions, 52 Penn Relay titles, set American, national and world records. Many were true Olympians. It is an extraordinary collection of exceptional young men. In this issue they'll talk about the preparation, the teamwork, the trust and the mindset that went into the culture that Jumbo Elliott and Jack Pyrah created that made for one of the more remarkable win streaks in the history of track & field.

LOW-GLYCOGEN TRAINING

BY JASON R. KARP, MBA, PHD

Excerpted from Jason Karp's new book *Running Periodization: Training Theories to Run Faster.*

It has been known in the scientific community since the late 1960s that the ability to perform endurance exercise is strongly influenced by the amount of pre-exercise glycogen (carbohydrate) stored in skeletal muscles, with muscle glycogen depletion becoming the decisive factor limiting prolonged exercise at moderate intensities (65 to 75 per cent of maximum aerobic power, VO_2max). Any marathoner who has hit the wall knows this intimately, as well. It is also well known that more glycogen in muscles before exercise results in a greater use of glycogen during exercise, and therefore increases the ability to sustain a high intensity (e.g., a faster pace). Research has even shown that fatigue can be delayed with carbohydrate supplementation during exercise.

The well-documented decrease in muscle glycogen content that accompanies endurance exercise results in an empty/refill-more cycle. When muscle glycogen is depleted by prolonged exercise, muscles respond to the empty tank by synthesizing and storing more than what was previously present, a process largely controlled by the hormone insulin. Empty a full tank, and you get a refilled larger tank in its place. (Imagine if your car, after driving for long enough that it ran out of gas, created a larger gas tank when sitting on the driveway. That's what your muscles do.)

When it comes to refilling a larger tank (and inducing greater mitochondrial enzyme activity, which enhances aerobic metabolism), training twice every second day is superior to training once daily. That was the conclusion of researchers at RMIT University in Victoria, Australia, after 18 endurance-trained, male cyclists and triathletes trained for three weeks. Half of the study participants trained six days per week, alternating days of 100 minutes of cycling at 70 percent of their VO_2max with days of high-intensity interval training. The other half did both of those workouts on the same day (separated by one to two hours of rest) every other day. The twice-per-day training strategy resulted in a marked decrease in muscle glycogen after the first workout, such that the participants started the second workout with significantly lower muscle glycogen than before the day's first workout. After three weeks of training, muscle glycogen significantly increased in the twice-per-day training group but not in the once-per-day group.

Aerobic enzyme activity and the amount of fat used during submaximal exercise also increased more by training twice every second day compared with training once daily.

However, despite the physiological adaptations that favored twice-per-day training, endurance performance (measured as the average power maintained during a 60-minute cycling time trial 15 minutes after completing a 60-minute ride at 70 percent VO_2max) didn't differ between the two types of training. (It's plausible that three weeks of training, although having an effect on muscle glycogen storage, enzyme activity, and fat burning, was not long enough to elicit differences in cycling performance, as measured in this study.)

A clever experiment at the Copenhagen Muscle Research Center in Copenhagen, Denmark also found that training one leg twice every second day for ten weeks caused greater muscle glycogen storage and greater endurance (measured as time to exhaustion during knee extension exercise at 90 per cent of peak power output) compared to training the other leg of the same person once daily.

Starting workouts with low muscle glycogen increases the transcription of specific genes and proteins involved in training adaptation, making it a promising strategy to enhance glycogen storage, which is a crucial factor for long races (marathon, ultramarathon).

Training consists of a series of threats to different aspects of your athletes' bodies' survival. Because carbohydrate is their muscles' preferred fuel during exercise, a low carbohydrate (glycogen) fuel tank is threatening to the muscles' survival. When that threat exists, your athletes' DNA gets busy transcribing genes that ultimately lead to making a bigger glycogen fuel tank to assuage the threat.

TRAINING CONSISTS OF A SERIES OF THREATS TO DIFFERENT ASPECTS OF YOUR ATHLETES' BODIES' SURVIVAL.

To prepare your athletes' bodies to store more glycogen for long races, low-glycogen training can be accomplished several ways:

(1) Training twice per day without consuming carbohydrate between workouts
(2) Running long (at least 90 minutes) on consecutive days (and consuming a low-carbohydrate diet between runs)
(3) Consuming a low-carbohydrate diet during periods of long-endurance, low-intensity training
(4) Not consuming carbohydrate during long runs.

Regarding this last method of avoiding carbs during the run, which runs counter to what most marathon runners do, one of the main purposes of long runs is to deplete (or at least severely lower) muscles' store of glycogen. Glycogen-depleted muscles force muscles to more effectively rely on fat for energy, stimulate the liver to make new glucose from non-carbohydrate sources (a process called gluconeogenesis), and stimulate a greater synthesis and storage of glycogen during recovery, all of which are important adaptations to prepare for long races, most notably marathons and ultramarathons.

If your athletes consume carbohydrate during their long runs, they won't deplete their glycogen fuel tank and will blunt these adaptations from occurring to their potential. To create the largest muscle glycogen storage possible, they need to deplete muscle glycogen on a regular basis. (In the marathon race itself, it's important to consume carbohydrate to prevent a severe drop in blood glucose. Since runners should never do anything different in the marathon that they have not done in training, they must balance the physiological adaptations with the practical concerns. To facilitate this balance, I suggest alternating long runs during which runners consume and don't consume carbohydrate. When they do consume carbohydrate, they should use the same gels and sports drink that they'll use on the marathon course.)

If your athletes run twice on the same day for low-glycogen training, the timing of the second run is important—they should do their second run before enough glycogen is synthesized and stored in their muscles (within a few hours). Runners shouldn't do low-glycogen training all the time, since carbohydrate is necessary to fuel high-intensity training. They should train with normal or high muscle glycogen during high-intensity training periods, and with low muscle glycogen during low-intensity training periods.

Dr. Jason Karp is founder and CEO of the women's-specialty run-coaching company, Kyniska Running. He is a coach, exercise physiologist, author of 12 books and more than 400 articles, speaker, and educator. He is the 2011 IDEA Personal Trainer of the Year and two-time recipient of the President's Council on Sports, Fitness & Nutrition Community Leadership award. His $REVO_2$LUTION RUNNING™ certification has been obtained by coaches and fitness professionals in 25 countries. Follow him @drjasonkarp on social media and learn more about Kyniska Running at kyniskarunning.com.

VILLANOVA ROUNDTABLE — REMINISCING ABOUT THE "JUMBO YEARS"

This is Part 1 of a roundtable involving some of the top Villanova middle distance runners of the 60s and 70s, reflecting on the great success of their relay teams, particularly at Penn.

BY RUSS EBBETS, EDITOR, TRACK COACH

INTRODUCTION

By Jerry Bouma
Villanova, 1974

There is something special about relays. While track & field is an intensely individual sport, the memories associated with a winning relay team linger long and are perhaps more cherished than individual accomplishments.

When it comes to middle distance running, there was no relay program that compares to Villanova University. From 1966 to 1981, Villanova teams won the Penn Relays Championship of America Distance Medley Relay for 16 consecutive years. During that same time-period, Villanova teams won a total of 52 Championships of America titles at those same Penn Relays. Furthermore, the track team was small—most years several team members would run three or even four races. It was an era that saw a continuous string of Villanova greats: Dave Patrick, Marty Liquori, John Hartnett, Ken Schappert, Eamonn Coghlan, Mark Belger, Don Paige, Sydney Maree and Marcus O'Sullivan.

What was it about the Villanova track program that produced these astonishing results? What were the drivers or the motivating factors? What was the consistent thread? How did the coaching, the training, the team culture, and the individual characters come together year after year to produce this success?

This Roundtable explores these very questions. It endeavors to gain a deeper understanding of why the Villanova track program

VILLANOVA BIO'S

Dave Patrick (1964-68) was an Olympic favorite in 1968, winning the 1500 meters in the first set of Olympic trials. Dave's storied career includes three world indoor records (880 yards, 1000 yards and 2-Mile Relay); 4 NCAA track championships, 2 NCAA cross country team championships, 6 IC4A championships and 7 winning Penn Relays Championships. Dave finished fourth in the second set of trials and unfortunately was not named to the 1968 Olympic Team. He was officially added in 2008.

Tom Donnelly (1966-1970) — Tom was the ultimate teammate running on three winning NCAA cross country championship teams, 3 Penn Relays championships and 1 NCAA indoor team championship including the winning DMR in 1968. Tom also won the IC4A 3000-meter steeplechase that same year. After graduation, Tom took up coaching at Haverford College and is best known for his work with Sydney Maree and Marcus O'Sullivan.

Chris Mason (1967-1971) — from Sheffield, England and the first Villanova athlete of British descent, Chris became Villanova's 4th sub-4-minute miler, running 3.59.9 in 1970. Chris left an incredible legacy of hard work and consistency winning 8 Penn Relays championships, 2 NCAA cross country team championships and 1 NCAA indoor championship.

John Hartnett (70-74) — from Ballyhooly, County Cork Ireland, John arrived at Villanova as the European Junior Cross-Country Champion (1970). His abilities on the track soon emerged—John ran a 3.54.7 mile in 1973, won the indoor NCAA 2-mile in 1974; 6 IC4A championships, all in different events (indoor mile, outdoor mile, 3-mile, 6-mile, steeplechase and cross country) and winner of 6 Penn Relays. John represented Ireland in 1972 Olympics, running the 5000 meters.

Ken Schappert (70-75) — from New York City, Ken showed his versatility running every distance from the 440 yards to the mile including cross country. Ken won the NCAA indoor 880 yards (1973) and was a two-time IC4A champion. He was part of 8 winning Penn Relays championship teams including a world record DMR and 2-Mile relay. Ken still holds the Villanova outdoor 880-yard record which he set in 1973.

Tom Gregan (71-75) — from Howth, Ireland, Tom ran 3.43.5 as an 18-year-old in 1971. At that time, this was the second fastest time ever run at that age, the fastest being Jim Ryun. Tom ran on 5 Penn Relays championship teams including the world record setting DMR in 1975. Tom won the IC4A indoor mile in a time of 4.00.6 in 1974.

Eamonn Coghlan (72-76) — from Dublin, burst on the world scene in May 1975 when he ran a 3.53.3 mile, a new European record in the same race where Filbert Bayi set a new record for the mile in 3.51.0. His accomplishments at Villanova are legend: the last two years he went undefeated ending up with 9 Penn Relays championship wins, 8 IC4A wins and 4 NCAA wins. Eamonn is perhaps best known as Chairman of the Boards, setting the world record for the indoor mile three times and the first to break 3.50 with his 3.49.4 – a record that stood for 15 years. A four-time Olympian, he was also the first Master (over 40 years of age) to run a sub 4-minute mile. He won the 5000 gold medal at the 1983 World Championships.

Mark Belger (74-78) — no Villanova runner has won more Penn Relays championships than Mark Belger with 10. Mark was a prodigious 800-meter runner as well as the 880 yards and the 1000 yards. He won 3 NCAA championships, 4 IC4A championships and was part of 3 world record relay teams – the indoor DMR, the indoor 2-Mile Relay as well as the 4-Mile Relay. Originating from Long Island, Mark became the second fastest all-time HS 800-meter runner in 1974, second to Jim Ryun. He just missed making the 1976 Olympic Team in the 800 by inches with a 4th place finish in the Trials.

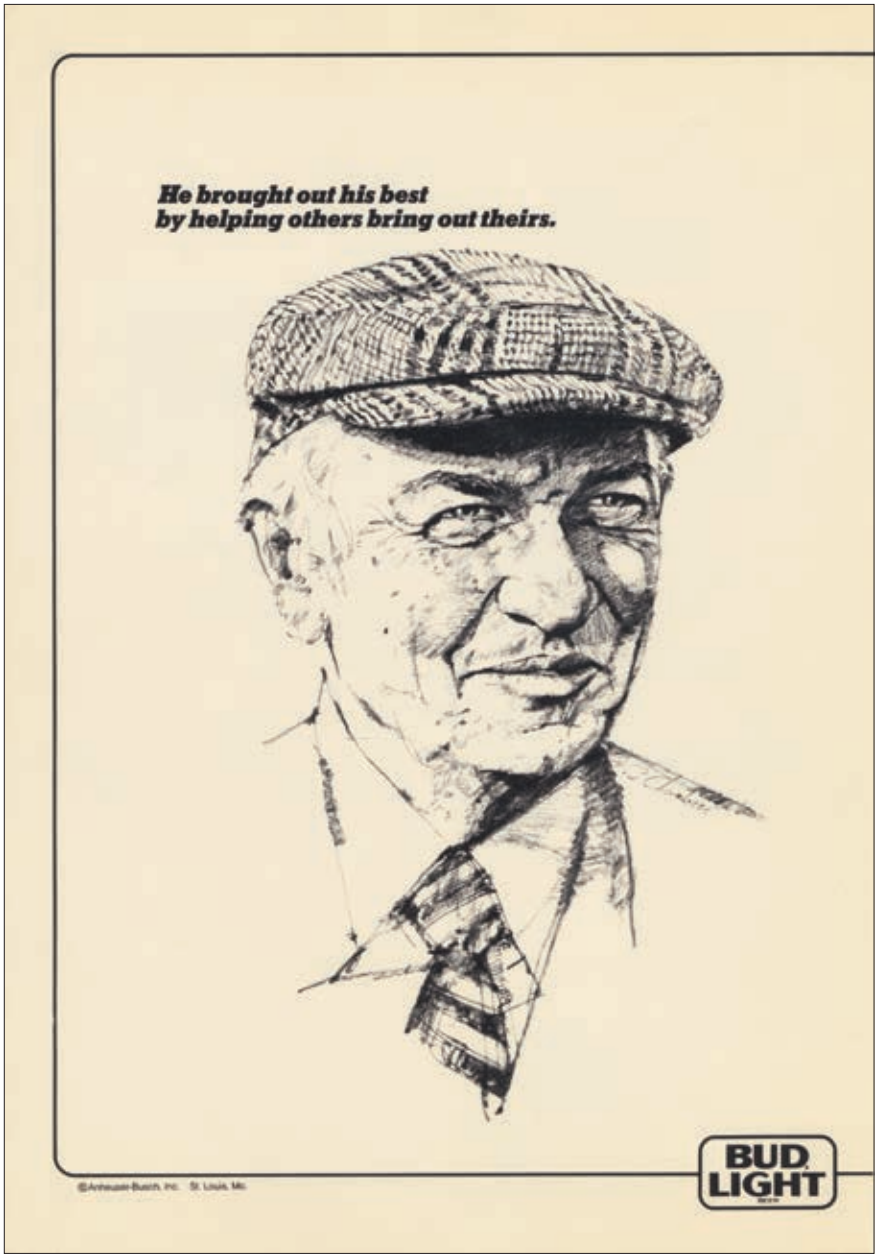
Gerry O'Reilly (83-87) — from County Meath, Ireland, Gerry ran a 3.54.6 mile in 1986, third fastest ever run by a Villanova athlete behind Sydney Maree and Eamonn Coghlan. He was a six-time Big East Champion; a two-time IC4A outdoor champion; and a two-time IC4A indoor champion. Ironically, Villanova finished second to Arkansas in the Penn Relays DMR in 1987, but in doing so Gerry anchored the team to set the school record in 9:21.02. He competed for Ireland in the 1988 Olympics.

was so successful for so long. Most importantly, it seeks to identify those factors that can be applied by any coach or track athlete regardless of the era.

This is the first time that the Villanova greats have been brought together and challenged to reflect on their amazing accomplishments. So hang on and enjoy the read.

The relays in track are a little different type of race. What is the first relay race you can remember running?

Dave Patrick (DP) — I only remember running two relays in high school. A two mile relay that I anchored as we wanted to be the first team in the county, maybe in the state in 1964 to break 8:00 minutes. We did it and ran a record 7:57. I remember cheering for my teammates to go all out and received the baton from Charlie Messenger and the rest is history. I always liked the pressure of running anchor with the mindset that I had to run all out to ensure our teams win. And of course the high school distance medley at Penn in '64 which is reviewed in more detail. Our coach was fighting like crazy to get us in the Championship of America race which almost didn't happen. We were never in a race in front of so many people, so the butterflies were intense as we waited in the bull pen to get our opportunity.



This is from a Bud Light advertisement featuring James "Jumbo" Elliott, Villanova track coach 1949-1981.

Mark Belger (MB) — I went to Mepham HS, a three-year high school on Long Island in New York which had run 2:03 for the 880 and 60 seconds for the 440 yard runs in Jr. HS. The program at Mepham was establishing itself as a track power with many of the upper class runners being sprinters. As a sophomore my coach focused me on the open 880 and the 4x440 mostly because we didn't have enough half milers and milers to flesh out longer relays. When I was a junior the focus began to move from the 4x440 to the 4x880. The point being, at most meets I doubled running the open 880 and a relay. To me, relays made us a team and though I don't remember the first relay race, I do remember enjoying running relays more than the individual races.

Tom Gregan (TG) — 4/30/72 - First Penn Relays Distance Medley: Championship of America. We won

and broke the Penn Relay Carnival Record — 9:37.5, Ken Schappert, Greg Govan, Tom Gregan, John Harnett

Gerard O'Reilly – (GOR) — My sophomore year at Villanova running the 1200m leadoff on the DMR at Penn Relays. It was my first time to compete at the PR so that first experience of dealing with a large crowd, the organized chaos of the paddock area, and looking at the guys you thought would be your main threat were all thoughts that went through my mind.

Chris Mason (CM) — I began my athletic/track career as a 14-15 year old in England running for a local running club. As such we were not exposed to relay meets as in the U.S. To be honest my first relay race was a road relay. That said, the first track relay race I remember was the Quantico Relays in 1968. I ran the ¾ leg on a freshman Distance Medley.

John Hartnett (JH) — My first ever relay race was freshman year anchoring the freshman DMR at the IC4As indoors at Princeton in 1971. We finished 3rd but I dropped my PR from 4.12+ to 4.04+. That's when I realized sub-four was possible.

Ken Schappert (KS) — I have always enjoyed the camaraderie in running relays; it does not take the place of an individual race or championship. What it does is bring a group that you become extremely close with, training together day after day, accomplishing something as a team that you all can cherish. My earliest memories of running relays were my freshman year in HS. I was put on the varsity 4X880; there were 2 seniors & a junior and me on the team. The two most notable high school relays were winning the sprint medley at the famed N.Y. State Relays and running the Championship High School DMR at Penn my senior year.

Eamonn Coughlan (EC) — My first relay race was when I was about 9 years old. We used play many sports around the streets where I lived in Dublin. My mates noticed I had good running ability and always picked me first when we had relay races around the "Old Clinic" building.

I ALWAYS GOT GREAT SATISFACTION KNOWING THAT WHEN I HANDED OFF OR FINISHED IF I WAS ANCHORING THAT I COULDN'T HAVE GONE ANY FASTER

How did you get started running? With several different cultures and nationalities, the exposure and entry can differ significantly. What drew you to the sport?

MB — In Jr. HS my dad told me I had to either join a sport team or come home directly after school. I tried soccer but was too slow. I wrestled, and really liked it, however I never made the Jr. Varsity team; regardless I enjoyed the workouts. I didn't like someone throwing fast balls at me, and I had my jaw broken playing flag football. I joined track, and without any training I ran my first 440 as a 7th grader. I ran a 63 on a cinder track wearing a sweatshirt, sweat pants, a ski mask, and sneakers. It was cold and rainy that day. The coach said I looked like a distance runner and had me run loops in the woods along the parkway while everyone else worked on the track. I'd jog to the forest and sit there watching the team train (they mostly did repeat 100y sprints). Sometimes I trained with the team. The second year I was given a team jersey to run in. Then first race that year was a little different. It was a 440. I went out harder than ever and was leading after the first turn. I remember thinking, "Where is everyone?, why aren't they running faster?". On the back straight I swung out wide and let the other runners catch up and pass me, and then I tucked in and from behind ran through the pack throwing elbows and zigzagging until I reached the front for a second time. Coming out of the last turn I started hitting the wall and tried to not let anyone pass me. I finished second and remember thinking, "That was fun." I started working out more with the team. The Jr. HS program only lasted about 6 weeks. After three seasons I had run a 2:03 880 and a 60 second 440. Four months later I was on the HS XC team and running my first workout. It was a 2-mile run. I couldn't do it. I felt ashamed and told the coach I had to quit. He encouraged me to not quit. Instead, he said, "Just show up and help out with the team". I did that for a day or so and saw all the guys having fun. My coach started me off easy, and before I knew it I was one of the better JV runners. It wasn't easy, but it was fun. That year, at age 15, I dropped down from a 2:03 880 to 1:53 and I had started to take training and racing seriously.

TG — 1967-15-years-old started running at my high school ("Swords" Voc Tech School). Joined my running club "Conliffe Harriers" and was coached by Maurice Ahern who became my only track coach beside Jumbo. By the age of

16-years-old I became the 2nd fastest under- 16-year-old to run the mile in 4:07.6. Jim Ryun held the record at 4:06.7. During the next three years I won most of the Irish national championships in the mile, 3-mile and half-mile.

What drew me to the sport was the feeling of complete freedom and control.

The harder I trained the better I became.

DP — When I was a young teenager, I would run everywhere I could. If it was to the store I would run it as fast as I could. When we played kids games I would always outrun kids trying to tag me. It was fun! My first quasi-race was in the 8th grade for physical fitness. We had to run the mile run and I finished a couple hundred yards in front of second place. My gym teacher knew I had talent and called the high school coach and told him he had a great runner that was heading to Kenwood as a 10th grader.

GOR — I grew up in a small town in Ireland where there were not tons of options available to young kids. We had Gaelic football, hurling and a local running club. I had a neighbor who was part of the local running club so he encouraged me to give it a try. I loved it and as I got older, I left the other sports and focused 100% on track and cross country. I think what I liked about running was the individual aspect of it, the harder you trained the more success. In team sports I found it to be a little frustrating that you could have 70% of the team committed to working hard but if other 30% didn't bother then as a team you probably wouldn't do well.

CM — My first recollection was in '56 (age 8) with Ron Delany winning in Melbourne. That got my attention, as he was Irish and a big deal was made of it in the UK. A few years later when they began to show the AAA championships (believe it or not the heats too) on the BBC; I began to take interest, especially with a few "local lads" and began to be prominent in the sport, with Derek Ibbotson setting the world record for the mile. I began to daydream of breaking 4 minutes, although I was not in training. At the age of 13-14 I played soccer for my school on Saturdays; this was also the only days that Sheffield would hold its cross country race in the local parks. As one of the better players I was told I could run only when we had no game that Saturday. When I finally got a chance to participate I came in the top 10 or so. The next race I ended up winning. At that point the school's Phys Ed teacher told me to join a local running club as he knew not much about training, etc.

JH — I had an interest in running from a very young age but didn't compete until I was 15. I started participating in 1-2 mile runs with the local Gaelic Hurling team. A neighbor noticed I might have some potential and invited me to join a xc/track club. My high school did not actively promote the sport.

KS — This is an interesting question. Growing up in an inner city and playing many inner city sports everyone wanted to be the best at something. Some were good at basketball, softball, handball, stickball I was fortunate to be one of the faster kids in running races. We used to have manhole cover races where you race from one to another in the streets. In 4th grade we had an intra-school track meet and I won the 50yd dash & 220. Aat the time I thought the 220 was a long distance run.

EC — My dad Bill introduced me to athletics. He was an athlete and used take me and my brothers to track and cross country meets from the time I was about 6 years old. Even at that age I always wanted to be a runner.

To a man you are all very experienced relay racers who competed in high pressure situations and no doubt agree with the cliché – "the chain is only as strong as its weakest link." Were you ever the "weak link" on a relay team? How did you prepare and compete as you reflect on that experience? What was your interaction with your teammates on that team?

MB — I was never the weak leg. In high school I don't remember running anything other than the anchor leg (4x4, 4x8, SM, DM). When the coaches strategized on how we'd approach district, county, and state meets, they often had to run the relays thin and score in as many events as possible which meant there was no single A Team. The A Team was broken up and the fillers were from our B runners. In a warped way you can say I was the weak link because I was typically doubling—if I failed we'd lose a lot of points. My teammates often just had to run the relay, and I remember them telling me they wouldn't let me down. I cannot say how proud I was of every B and C runner who stepped up and ran their heart out. Regardless of the finish, when we're at reunions even today, some have come up to me and said they didn't want to be that guy who couldn't help me

since I had to double and triple at the big meets. In college, several times the situation was the same as in high school. I've always been proud and happy to run on a relay. After all, they were my teammates.

CM — When you have one of the top milers in the world, I was always a "weaker link"; this always took the pressure of the rest of the team. From what I recall no discussion occurred.

JH — I was the weak man on relay teams on a few occasions. As a team, we didn't discuss strategy a whole lot. We knew as a team that each member would give 100%. Relays had a significant tradition at Villanova and each team member was going to give his all on the given day.

TD — There was never any real pressure on me. I figured that I just needed to be as good as the 4th best guy on the next best team out there. We always had an Olympic 1500 guy anchor the years I ran so I just needed to make it around the track 4 times.

GOR — I'm not sure I was ever the "weak link" but there were plenty where I wasn't the strongest link. I always got great satisfaction knowing that when I handed off or finished if I was anchoring that I couldn't have gone any faster. If I felt I gave it everything I had but got beat then I could always look my teammates in the eye and tell them "I gave it everything I had."

KS — I have to totally disagree with the above statement. I have been very fortunate to be a part of some of the greatest relays in the mid 70's with some of the greatest teammates ever. To say that

Dave Patrick

anyone was the weak link would be a travesty to a teammate. In running relays you need to know your competition and if you know that, you then know how to race them and give the team the best advantage to win. This is what puts teams like VU way ahead of teams that were faster than us on paper. Jumbo had the magic.

DP — I was placed in the anchor position which is the position I prefer. I realize I have to run 3X harder as I have three other teammates that are putting it on the line. I had only known racing anchor in all my high school and college relay races. I enjoy most running from behind so that I could size up the competition and plan a strategy to win for the team. Our guys knew that if I got the baton in contention we could get the victory as they had confidence in me and I wasn't going to let them down. Upon reflection, I was a weak link one time when I did not run anchor and that was on the mile relay at dual meet with Tennessee in '68. After winning the 880 versus Tennessee NCAA half mile champion Larry Kelly, Jumbo put me on the mile relay. A leg I will always remember as I got smoked the first 220 before working my way back with a 47.8 leg. It was special knowing that the anchor of the relay was The Mighty Burner (Larry James) who tore up the track as we defeated Tennessee with at time of 3:09.4.

EC – Fortunately, I was never considered as a "weak link". Our preparations were similar to preparations for any race. The camaraderie between teammates was important for a successful outcome. We trusted and believed in one another's ability. That alone gave us confidence to win all the time. When I got the stick I was inspired to run, more because this was for the team, not me!

On the flip side most of you have also been on the anchor leg. How was that mindset different? Was it more pressure on you? If so – how did you cope? Or was it more, "Just get me the stick (…and I'll take care of things)?"

TG — Being on the anchor leg was always a dream come true. The mental capacity and focus suddenly changed from running a relay race to running an individual race.

Once I got the baton tucked away, I was always given the lead or in 2nd place and completely ahead of the rest of the field and out of harm's way. After the first 20 yards I mentally switched from running a relay race to running an individual race against one or two other competitors. I always knew their weakness and focused on my race plan.

GOR — Anchoring a relay at Penn Relays especially an event like the DMR is a real pressure cooker. You know you're carrying the hopes of Villanova, your current teammates, and the legacy of the successful Villanova teams from the past along with your own expectations. Then you need to focus on your race plan, if I get the stick in the lead what do I do, if I get the stick 50 yards back what should I do. Who are the big kickers? For me, I always felt confident that if I got the stick in contention, I could deliver because I knew I had put in the work.

MB — I preferred getting the baton in second place which gave me some time to measure up the other runners and helped to decide when to strike. I don't really remember telling anyone to get me the baton in second. On the other hand I remember more saying, "Just get [Dave] me the baton within 20 yards of the lead". I loved to race and relay racing typically meant you needed to come from behind (which is way more fun than running from the front). On the other hand, if I did get the baton in the lead I'd hammer the pace early making the runners behind me go out too fast which meant you didn't need a blazing kick to finish the race. It was a game of tag.

CM — I was only the anchor at Penn on one occasion, the Sprint Medley. I considered myself a miler + rather than an 880 runner. I was scared and probably ran that way. However, in my opinion I would have probably been beaten anyway as I was up against a bona fide half-miler. It was the relay that ended a five-year streak ('67,'68 '69 and '70).

JH — Definitely more pressure on the anchor leg because your teammates are relying on you to bring it home. Due to my lack of speed, my strategy was always the same. Go out strong and stay strong.

DP — See Above- Running anchor is the ultimate compliment a coach and teammates can have in you. Their confidence that I can do the job only helps to increase my determination and mental toughness.

KS — The mindset is somewhat different but at times it's the same as I stated above. You need to know the competition and the best way to beat them.

You always want to make sure your anchor is given the best possibility to win. Like in the 1973 DMR when we ran against Bowling Green with [Dave] Wottle on the anchor leg we knew we had to give Hartnett a good lead so it would not end up with a sprint to the finish. When I handed off to John he had a 14-second lead and I ran 53 pt. on my final lap. At that point we knew that John was going to make him work to even get into contention.

Whenever I ran anchor and did so many times on our 4X800 I was always comfortable if I got it with the leaders. I never felt pressure. That's something you put on yourself and it can turn into a heavy burden. To me it was always an adrenalin rush but you had to know what was the best way to beat the competition go out hard and challenge them or be super confident in you final kick.

EC — Yes, "get me the stick and I'll take care of it" sums up my love of relay running. When you learn to consistently win individual races the same confident attitude takes over. This positive attitude applied to all teammates who carried the stick. All for one, one for all!

Jerry Bouma has stated that there are three seasons at Villanova – cross country, indoor and Penn Relays. What do you remember about the 2-3 weeks leading up to Penn? I'm thinking of training preparations, specific workouts, the conversations, the atmosphere or preparatory races.

MB — Very true. XC was build-up for indoors, indoors was the training season for Penn. Typically after the indoor NCAA's I remember taking a few weeks off from training and just jogged some miles. Then when spring season started we'd run 4-6 quarters on the cinders' twice weekly with the quarters being an easy float at 58-60 seconds. That was it. My mantra was "never lose at Millrose, never lose at the IC4A's, and never lose at Penn." As far as training went, there were a dozen middle distance runners to train with so it was easy to hide out and float in the middle of the pack, no pressure, just find the stride and be ready. A week or so before Penn we ran the Rutgers Relays (?) as a warm-up meet. I never ran well, my allergies typically hit hard in early April. I was lucky to run a 1:54 880. It didn't matter. The next meet was Penn.

DP — Cross country was the real foundation—more miles, greater

number of intervals. Although quarters were the bread and staple, repeat halves and even mile runs were challenging and helped to build the foundation. We knew what was only a few weeks away and as the day got closer our resolve to give our very best became greater. We knew the training would quicken with faster quarters 7-10 days before Penn. We worked together as a team in workouts, spurring each other on, taking turns leading, knowing if you could get through the "quicksand" on the first turn the rest was downhill. We knew that the last 2-3 would be every man for himself, pushing hard to get the most out of the workout. Fine tuning our physical side and then working on the mind!! Like other big races (IC4A's and the Nationals) I would lie in bed at night preparing my mind to handle the physical pain that I would have to deal with in the race. Planning multiple strategies depending on where I took the baton, knowing I would draw upon my mental toughness and spurred on by the crowd and teammates.

In summary, we were all business a couple of weeks before Penn, fine tuning our mind and body no matter the obstacles—tough teams, tough weather it made no difference.

CM — The weeks leading up to Penn usually began with a week or two "rest" from the intense workouts from the Indoor season after the NCAA Indoors. For a few of us the NCAA indoors usually meant multiple races over two days too, not unlike Penn, so the roads became a nice change. Early April we began training on the "track" at 'Nova. April it tended to rain a lot and we sometimes had to do our repeat quarters on the grass strip in front of Dougherty Hall. In preparation for Penn we would then race into shape with the rare dual meet and the Iona and Quantico Relays. The latter two being Jumbo's version of "Spring Training" in which his team would be put together for Penn.

TG — The workouts became like race day. The pace of the training session running a 10 x quarter-mile sessions was faster than race pace itself. We would run a 10 x quarter (440) session doing 58 sec. per lap with a fast recovery time out. Each guy would be the pace setter/leader for each quarter-mile run. On the final two 440's Eamonn and Schappert would blow out a 57 second lap pace just because we felt great and really tuned in for running that type of pace at Penn in days to come.

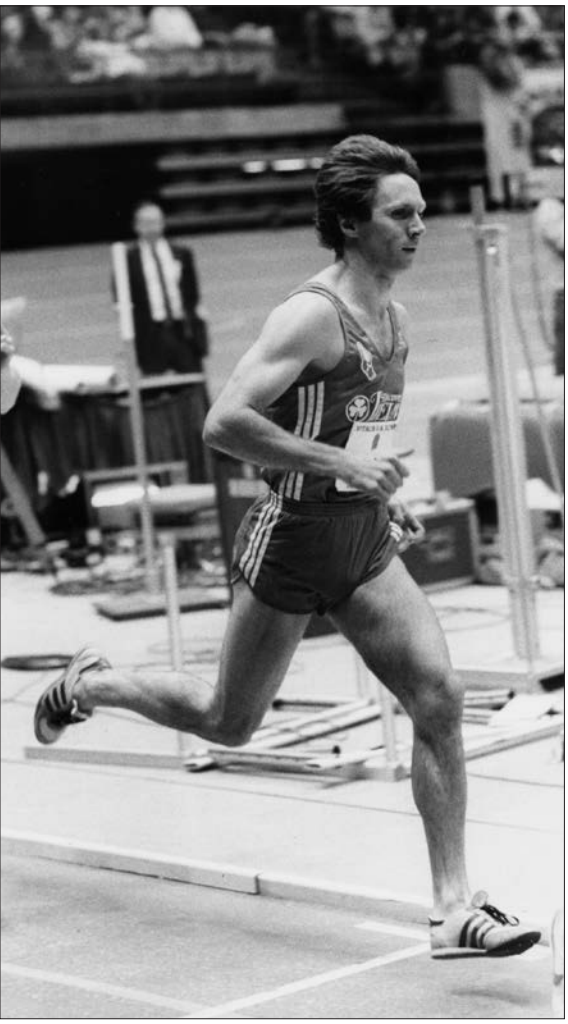
We never did much practice of the "baton exchange" itself. Two days before we would have a very easy workout and Jumbo always then said let's go to the football field and have some hand-offs exchange. We did maybe five or six practice exchanges and that's it. In one of the exchanges I was doing with Greg Eckman (440 leg man), Greg would run full out towards me and I messed up the exchange. Jumbo would yell at me and say "'Tom Cat, focus on his hand as he is coming to you. And don't mess it up again." My punishment was doing a few more exchanges with Greg. Our focus on Thursday and the morning on Friday was not messing up the exchange and controlling the "track space around you" where you waited for the incoming man.

GOR — What I remember was hearing from upper classmen the importance of the Penn Relays during my freshman year. I think on campus there was almost a feeling that a successful year was measured on how we did at the Penn Relays, NCAA's were almost secondary. There was definitely more of an urgency in training in the weeks leading up to the relays, the joking around was replaced by a more serious mindset.

JH — Yea, there wasn't much of a break between indoors and Penn relays. the first few weeks after indoors, I usually started to build some mileage on the roads again and just recover. About 2 weeks before Penn, there were usually a few fairly intense track sessions.

TD — I always thought the three seasons (indoor/outdoor/Penn Relays) was a pretty cool saying, though as a distance runner, I would say that many of us would include a 4th season, cross country. That season also spanned half of the school year with the three others covering the same amount of time second semester. Cross country also laid the foundation for enabling our great middle distance guys to double and triple effectively at Penn and other big meets. Jumbo just viewed cross country as a conditioning period. He wanted you ready and strong and in shape to start with track on January 1. Don't think it mattered to him if we qualified for nationals as a team or ended up winning the meet (which we did four times in a 5-year period). It did matter to the guys on those teams. Still, I don't think he was ready to hand back those NCAA championship trophies.

EC — Two to three weeks out from Penn we were not necessarily in the best of shape. We'd experience a few below par performances at either the Queens-Iona or the Dogwood Relays. Those poor runs



Eamonn Coghlan

perked us up and made us train that bit harder. Usually anything from 10 x 400's to 20 x 400's. We knew Jumbo expected more of us and he instilled belief in such a way that he scared us into top shape. We all got the message that we'd be primed for Penn. We had no choice!

KS — For most of us Penn Relays preparations always started on April 1st. It was the excitement of who is going to run what and in what position on the relay. I always remember the week or two before Penn we always ran Queens-Iona Relays. We all ran different events and in multiple relays to see just what type of shape we were in and then would fine-tune for Penn.

The conversations differed each year depending on what we thought we could accomplish. I remember in 1975 the evening before the DMR a few of us were chatting and I said I think we could get the world record if everyone runs to their capabilities. That's exactly what happened that evening.

Were there any rituals you adopted or followed on the day of a race at Penn that you saw as good luck?

MB — I wished and hoped for rain, wind and cold temperatures. When race conditions were bad, while warming up, you could tell who was ready to run and who wasn't. It lessened the need to strategize. If it was sunny out I'd jog in the shadows of Franklin Field and clear my mind. Typically, before going out on the track you'd meet with Jumbo who'd squeeze your shoulders and say something like, "Don't drop the baton."

TG — One hour before race time I would leave the stadium and go outside one block away and do my warm-up. This area was private, away from the crowd but close enough to hear the roar of the crowd in the stadium. There were no other people around just me and my focused thoughts and nervousness. This was very special because I was by myself getting into my race zone mental framework but so very close to all the excitement of what was happening inside the stadium.

No other athlete from other schools found this private place to warm up.

GOR — I always had the same warm-up routine and before the race, stretched on the same area of grass and did my striders on the same sidewalk. I'd look over at the Villanova section at the bottom of the backstretch when I was in the paddock area. Hearing the voice of the announcer Jack O'Reilly always got my adrenalin pumping; if he was involved you knew you knew you were competing at something special.

KS — From Tuesday on the week of PENN we all started to taper and Jumbo would be full of fun and laughter knowing this would relax us. We also never really knew what we were going to run till the day before, we also did not know what position we were going to run till Jumbo made his decisions.

Jumbo's reasoning I learned later on was that he did not want us to worry about our races till the time of the race. He was a master at that. "You do the running and I'll do the worrying," was his thought.

EC — I guess there were some unspoken rituals. We knew well what was expected of us at Penn, we knew we were Villanovans, and we knew we had no choice but to win. Before we'd enter the track, Jumbo reminded us of this as we gathered under the bleachers near the finish area. We'd look at one another in the eyes and say, "Let's kick ass."

DP — Getting to Howard Johnson's for breakfast which certainly beat the awful food in the cafeteria. Really, just being supportive of the team. We had a job to do, and we had each other's back to ensure victory. We always kept things lighthearted with jokes and pranks. Most of the time we trained together, we ate together, we loved each other.

Racing consecutive days with multiple races is not something most of you had any experience with prior to college. How did you approach this physically? How did you prepare yourself mentally?

MB — I totally expected to double and triple on weekends which started in HS. Welcome to my reality. It seemed like you don't go to a track meet to run just one event. "Whatever you do, don't drop the baton".

CM — Relied on the coach's workouts, did not overtrain and made sure to get a good night's sleep on the TWO nights before the race(s).

DP — High school was a good precursor for Penn. Winning the HS DMR championship and then running 1-2 with Charlie Messenger in the inaugural running of the HS invitational mile helped set the stage for what was to come. Freshman year was frustrating not being able to run at Penn.

Physically, the challenging cross country season of building base and some sharpening during the indoor season set the stage for Penn. We knew we were capable of multiple races and looked forward to running as many relays as possible.

JH — That definitely was a new experience for me. But since I was used to competing over longer distances, doubling up on the mile wasn't a huge stretch.

KS — As Gerry stated there were three seasons for us at VU, cross country, indoor & outdoor. During the XC season is where we all built the base to get us through the long season that we had. It was extremely important to build that base during the fall. It didn't matter if you were an 800 guy or 10K guy we all busted our asses in the fall many logging more than 100 miles per week. This was the foundation that we took to indoor & outdoor to fine-tune our event. When it came to Penn Relays time there could be no doubt that you were ready when it was your time. I always felt like superman when I put on the jersey to run at Penn.

From the mental approach, knowing that you put in the work and you have three other guys on the team that had the same focus as you made the challenge less stressful.

TG — The physical part took months to do. Jumbo explained it to me this way. "Tom Cat, the training work you do during the fall and winter is just like making a deposit into your bank account. The better you train (deposit) your body and mind way before race day ……and when it comes to the race day weekend you will have more energy and strength in the bank (my mind & body) to be able make the correct withdrawals for mutual races for the team."

Mentally I just focused on one race at a time and did not worry about the other race later on in two hours or so. I had to take care of business at that moment for the team. I was always confident about my recovery time between races because that's the way we worked out as a team…. fast pace sessions with controlled short recovery time.

EC — We prepared hard. Tough workouts on the track sometimes four or five days in a row along with hard runs over 10, 15, 20 miles on Sundays. If you could handle these workouts, you knew you were ready to handle running in three relays over two days. Our mental approach was one relay at a time.

We weren't satisfied winning just one race, we wanted them all. Each win inspired us to the next and so on! We had the mental strength to handle any physical challenges because we were prepared, and we drew off one another.

GOR — I looked at what guys like Eamonn Coghlan, Don Paige, Sydney Maree, Marcus O'Sullivan and John Hartnett did. They set the bar for the rest of us and proved it was possible to run multiple races at a high level on consecutive days.

Why are the Penn Relays different? I once heard Penn State's coach Harry Groves say he'd rather have a win at Penn than win an NCAA championship. What was the appeal?

TG — I learned very fast why the Penn Relays are different…..

1972 was my first eligible year to compete in the outdoors. I did not know anything about the Penn Relays except that Marty Liquori beat Jim Ryun there in the Dream Mile. I made the distance medley team that first year and never saw or visited Franklin Field until I showed up on that Friday around 1:00pm for my 3:00pm race time. The team was made up of Ken Schappert, Greg Govan, Tom Gregan, John Harnett in that running order. I was overwhelmed by all the activities outside the stadium with all the vendors selling stuff. The crowds were immense, but I had to figure out where to find a place to go and warm up for my race and not be late trying to get back into the stadium for the race.

"The story goes this way….reported by The Philadelphia Inquirer *sports page article on 4/30/74…*

"Tom Gregan, The Villanova freshman from Dublin, Ireland, had something on his mind. "Mr. Pryah." He said to Jack Pyrah, Jumbo Elliott's assistant, "is the Penn Relays an important meet?"

Pyrah's jaw dropped. His eyes widened. His pulse quickened, "Important meet!" he exclained, "Ask Jumbo that question."

The poor bloke (Gregan) simply didn't understand. Sure they call it the Penn Relays. Have for 78 years. But ever since the Irish began landing on the Main Line campus nearly two decades ago this has been the Villanova Relays….Jumbo's meet."

So my first race at the Penn Relays was running the coveted Distance Medley. To that date Villanova had won six straight DM's. I ran the ¾ leg and John anchored the mile. I handed it off to John at the front of the pack and John ran a great race winning by 10 inches over Bob Wheeler from Duke. We broke the Penn Relay Carnival Record at 9:37.5.

GOR — It's the biggest relay carnival in the world, attracts the best colleges so you know you get to compete with the best of the best and it's local so even non-track fans know it's a huge event.

MB — A relay team is special. It made track & field a team sport unlike the 880 or mile which are individual events. Besides, everyone came to Penn to win; you couldn't underestimate the East Coast competitiveness when it came to running at the Penn Relays. It has been more than 40 years since I won a 10th Penn Relay watch, and I'm humbled to have been on a team where the coaches figured out year after year how to put us in a position to win every time we stepped on to the track. It was fun. You came to win or at least make the other guy run like they've never run before.

WE FELT THIS WAS OUR HOUSE AND NO ONE WAS GOING TO TAKE IT FROM US

CM — For me it was the tradition and bar set by the '68 team that made the Relays important to me. At that time Penn was the premier relay meet, in which the major programs all came with the goal of knocking off 'Nova in the distance relays.

JH — I would disagree with Coach Harry Groves. I would definitely place an NCAA title well ahead of a Penn Relays title, even an MVP title at Penn. No doubt, Penn is very special, especially for Villanova teams. But I would have it in a distant 2nd spot. The tradition of the meet, the crowds, the atmosphere and the fact that it is primarily a relay meet all contributed to the uniqueness of the event.

EC — Well I can't agree with Harry! Winning an individual or team title at the NC's is a greater achievement. Winning at Penn is all about the tradition, the fanfare and an occasion to be part of the team. It was about pride. Putting four guys together to perform on the day is not easy, but we managed that so well because of the training environment created by Jumbo and implemented by one and all. Penn is a buzz when we can share success together.

DP — I think a lot has to do with the tradition. The oldest running relay meet in the world. Franklin Field has seen all the greats run there and you just wanted to have a chance to join the club. Penn had a special "aura" about it as it was close to home, in our back yard so to speak. It was reminiscent of the modern day motto, "Protect this House!" We felt this was our house and no one was going to take it from us. The crowd, the constant running of races, the roars from the North stands coming around the turn to the homestretch. The extra adrenalin we seized from the chants in the stands only served to make us a few steps faster. And so many patriotic Philadelphia track fans rooting with all they had for the Philly area school. As soon as you put on the Villanova singlet, you knew a tremendous opportunity was waiting for you.

KS — It's definitely the excitement that surrounds this meet. There are two great relay weekends in April, Drake Relays and Penn. For some reason Drake was always a great field competition and Penn attracted strong relay participation.

The other thing about Penn is that it had a huge high school attraction with teams coming from all over the East Coast and mixing it up with the college events. So what you ended up with is the best of the best from H.S. and college. Then you inject the Jamaican attraction and you have a great track weekend.

Part 2 continues the discussion in the next issue.

VISUAL SENSORY DEPRIVATION (VSD): AN INNOVATIVE TRAINING METHOD FOR PROPRIOCEPTIVE SPECIFIC-STRENGTH ENHANCEMENT

Though the author describes how Visual Sensory Deprivation exercises may be incorporated into hammer throw training he makes it clear that VSD may be beneficial for any discipline requiring balance, precision, power, strength and conditioning.

BY NILS OLIVETO, MSC, CSCS

INTRODUCTION

Sports science research has significantly contributed over the years in improving Paralympic performances (7). Various studies have demonstrated that the physical preparation of visually impaired athletes competing in Paralympics events incorporates similar strength/power exercises as their sighted counterparts (9). However, intricate physiological distinctions do exist between visually-impaired Paralympians and Olympic athletes within a training framework. The components associated with the former include altered postural stability, non-visual proprioception and modified somatosensory systems (3). A greater understanding of these components can therefore potentially create an innovative training scheme for non-visually impaired competitors. The rationale of this paper is to propose a way to enhance proprioceptive specific-strength using a Visual Sensory Deprivation (VSD) method catered for elite sighted athletes. This article will use the hammer-throw in track & field to demonstrate the application of such a VSD protocol.

HAMMER THROW BASICS

The hammer throw is one of four throwing events in track & field in which a metal ball (7.26kg-16 lb for men/4kg-8.8lb for women), attached by a steel wire and a handle, is thrown as far as possible for distance. This action is executed by generating a rotational motion that creates an acceleration of the implement up to the point of release (5). The throwing motion can be divided into three phases as shown in Figure 1.

- Phase 1: the preliminary winds (one, two, or more swings of the implement above the head, the body in a static position, both feet remaining in contact with the ground).

- Phase 2: the turns (3 or 4 spins with the hammer in which the athlete rotates with the implement as a system, alternating the feet's double and single supports in each turn, inside a 7-foot diameter circle (12).

- Phase 3: the final release for the toss.

The goal of the preliminary winds (Phase 1) is to slowly create a horizontal velocity build-up and to properly establish an initial plane of motion to the hammer. This opening sequence of the throw allows for a smooth transition into the subsequent rotational patterns occurring in Phase 2 (the turns) all the way through the final release (Phase 3) of the throwing motion (12,13).

Motor awareness of a hammer thrower includes the following: body position during the rotational throwing motion, level of muscular tension with the hammer (required to maintain balance between the centrifugal force pull of the implement and the centripetal force applied by the athlete) and the amplitude of movement (maximizing the length of the radius between the hammerhead and the thrower's center of gravity, i.e. the hips) (4). It is interesting to point out that the sum of the dynamic-phases executed by hammer throwers yields the largest kinetic energy of any athletic events (15).

PROPRIOCEPTIVE AND SOMATOSENSORY ELEMENTS

Proprioception is the body's own sense of position and motion, which includes body segment static position, accurate perception of forces, displacement, timing of movement velocity, acceleration, and applied muscular contractions during the performance of a particular motor activity (19,22). Ogard et al. (14) point out that balance is not synonymous with proprioception. Balance is defined as the capacity to uphold the center of mass within the base of support and relies on precise inputs from the somatosensory, vestibular and visual systems (11). In regards to specific proprioception in the hammer-throw, it is the processing of the Central Nervous System (CNS) which determines the relative position/motion of the whole body (14) while keeping bal-

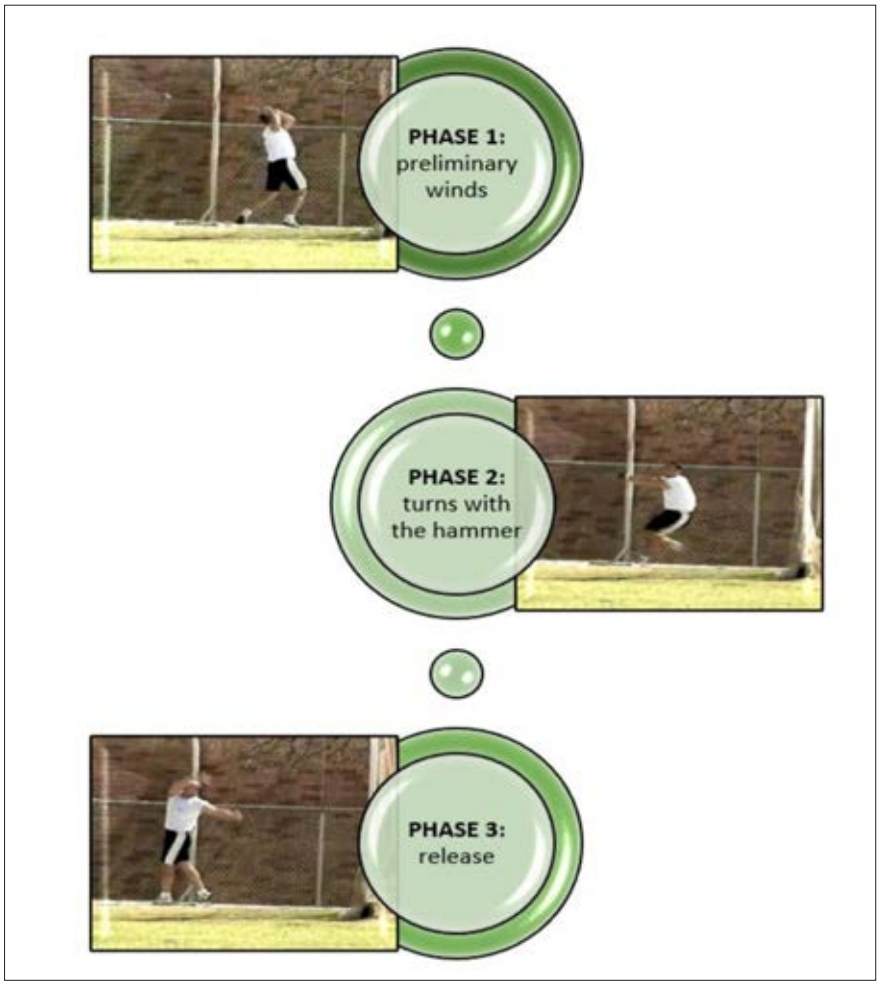


Figure 1: Phases of the hammer-throw

ance with the hammer implement. The sequence from the sensory systems leading up to proprioception is demonstrated in Figure 2.

The somatosensory system provides multiple feedbacks to the CNS from numerous muscle (primary from the muscles spindles) and connective tissue receptors contributing to balance and proprioception (6). **The vestibular system**, which has a gyroscopic equilibrium mechanism located near the inner ear, contributes critically to both navigation and spatial orientation by using its receptors (comprised of semicircular canals and otolith organs) and making them highly perceptive to any variations in position of the head and subsequently of the entire body (1). Given the complex rotational nature of the hammer throw's biomechanics, the vestibular system is fundamentally important in its function.

The visual system controls primarily the information delivered by the other sensory systems. The visual and proprioceptive systems provide the athlete's CNS with essential inputs about what is occurring in his or her external and internal environments (11). These centers supervise the body's position awareness in space, essential in an event which requires an immense level of balance such as the hammer-throw.

Insufficient balance control and proprioception are often associated with a diminution in muscular strength (8). Proprioception can therefore be heightened through specific resistance training, ensuing an amplified degree of physical awareness (18). This occurs as perceptions surface from the receptors of the CNS, which presents the body with data about internal and external environments (18). Specific resistance training develops an athlete's aptitude to sense the muscles as they execute the various drills. Consequently, athletes performing training workouts with a VSD can enhance the proprioceptive, vestibular, and somatosensory systems (2,18).

BLOCKING VISUAL-SENSORY INPUTS

One method of enhancing proprioceptive effectiveness is to block inputs from the visual sensory system, i.e. the eyes, with a sleep mask. Meir reports that the brain centers, which control and regulate balance, are indirectly receiving

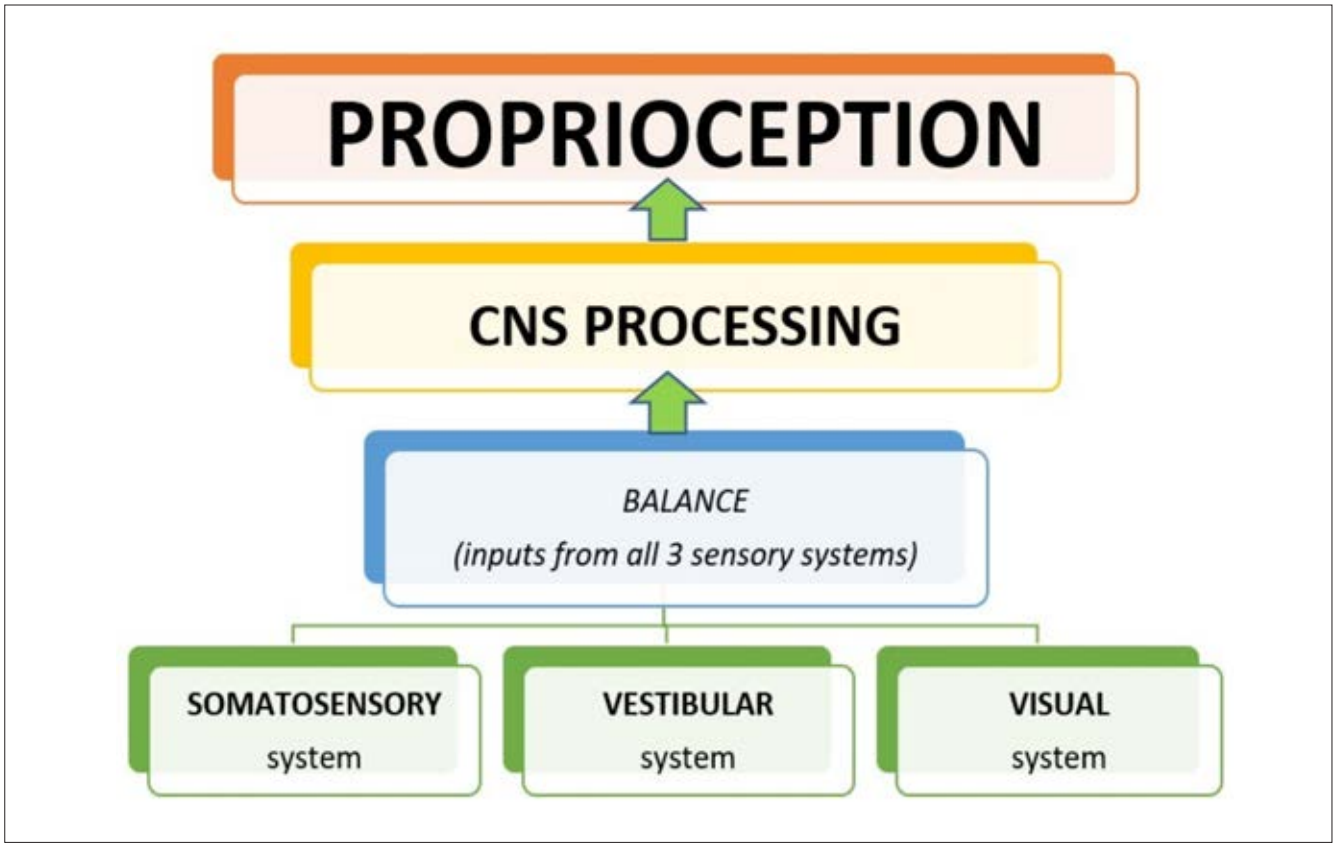


Figure 2: Sequence elements of proprioception

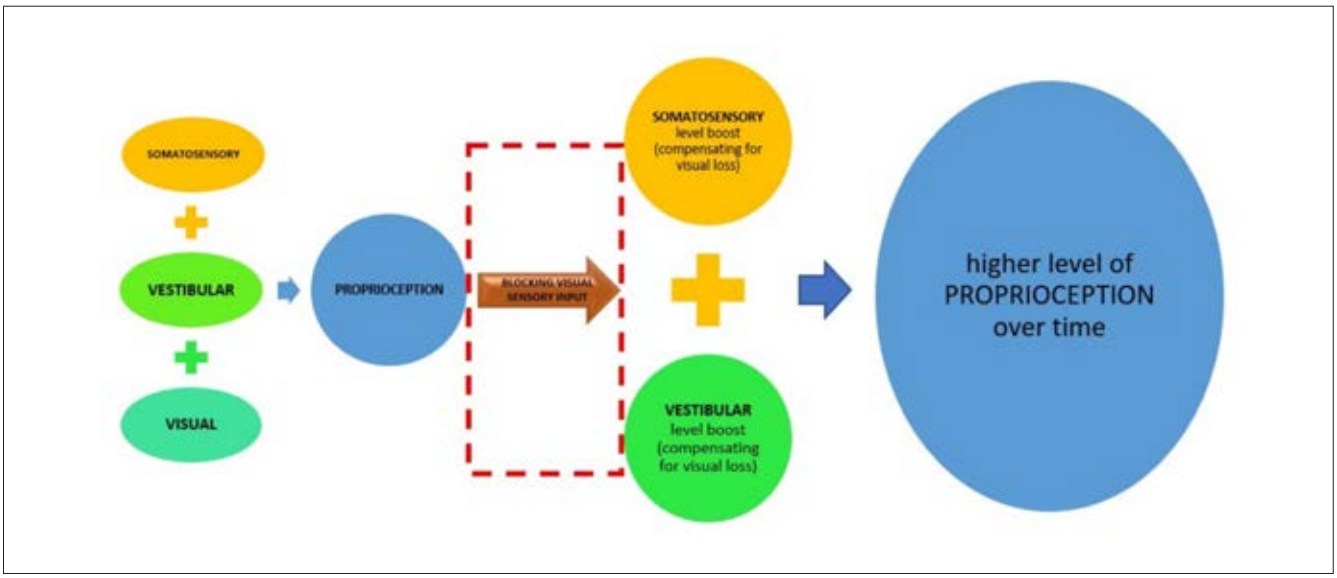


Figure 3: Effect of blocking visual sensory inputs on proprioception

about 20% of the optic nerve's fibers (11). Because the athlete's eyes deliver an estimated 80% of the inputs processed, they clearly play a vital part in the overall performance mechanism (11). The proprioceptive and the visual system are so complexly linked that when the visual system is deprived of any incoming information, one must adapt by relying more on the other components (i.e. somatosensory and vestibular) of the balance system (2,18). Such synergy between the tactile and gyrating mechanisms creates a compensation which boosts the information influx from both the somatosensory/vestibular systems and offsets the absence of incoming visual data (Figure 3).

Stronks et al. state that a visual input deficit can be offset by the improved skills development of a blinded individual's other sensory systems (21). The visual cortices of a sightless person are recruited by other operating brain zones and become reactive to physical and auditory information, as revealed by neuroimaging research investigations (21). It can therefore be argued that an athlete's enhanced motor awareness (or any other specific-strength motion) could also increase over time when the movements are performed upon the return of a full visual sensory access if proprioceptive sensitivity is augmented.

STRENGTH-SPECIFIC VSD

The hammer throwing motion is quite paradoxical. On one end of the spectrum, the athlete must keep the upper body completely relaxed. This is paramount for adequate rotational velocity in Phase 2 (12). Such a sequence will ultimately lead to an optimal whipping effect and peak velocity release in Phase 3. On the other end of the spectrum, strength output in the preliminary winds and the subsequent turns is quite significant. Full body strength and postural stability are therefore mandatory in keeping the athlete in balance while maintaining the axis of rotation throughout the throwing motion (12,23).

According to Aydog et al., the visual system is connected to the proprioceptive centers of the brain and directly impacts this dynamic postural stability (3). Figure 4 is showing a strength-specific dynamic postural stability VSD drill (blindfolded), mirroring the preliminary hammer winds (Phase 1) motion by using a chain, a handle and regular gym plates. The length of this makeshift ''hammer'' is about the same as the regular competitive hammer (121 cm/4 ft) for a higher level of specificity associated with the elliptical trajectory of the ''real'' hammer winds motion. This drill requires a higher effort in proprioceptive dynamic postural stability since visual data is not accessible to the visual system.

Table 1 suggest a VSD 4-week microcycle (linear model) proprioceptive specific-strength example using the hammer winds drill. This suggested training sample is designed for an experienced male hammer thrower (+ 60m/+ 200ft) who competes with the regulation 16lb implement.

Figure 4: Blindfolded VSD hammer-winds

For the purpose of avoiding asymmetrical muscular development and optimizing proprioception coming from different angles' stimuli, it is suggested to perform this motion both clockwise (CW) and counter-clockwise (CCW). The first warm-up set is executed keeping the eyes open with a regular competition hammer (16lb for a male thrower). The number of repetitions (CW and CCW) are in parentheses. For the subsequent VSD (blindfolded) sets, regular gym plates can be used with weights, chosen accordingly, relative to the proprioceptive strength level of the thrower. The coach also has the option of requesting the athlete to vary the speed of execution for an even greater range of neuro-motor stimulus via the larger moment of inertia created by the hammerhead's velocity. Such a core stability drill, requiring a higher level of proprioceptive specific strength, can be incorporated into a scaled back intensity classical strength/power training with a suggested recovery time of 3-4 minutes in between sets (12).

It is imperative to point out that any blindfolded dynamic activity has an increased risk of injury, so safety is crucial in avoiding accidents (18). Athletes might have to rely on their coach for security precautions, guidance and technical corrections. However, as they gain more abilities over time, they will learn to trust their sensory systems senses and accomplish the workout with greater precision (18). Coaches should only allow their athletes to proceed with heavier loads if the VSD's technique is correctly and safely executed while blindfolded.

INCORPORATING VSD INTO A PERIODIZATION PROGRAM

The neural, muscular, and physiological stress resulting from all aspects of the athlete's global physical preparation cannot be ignored when designing a peak performance plan (17). Oliveto emphasizes the importance of accurate quantification of the overall training volume load parameters within a strength-training periodization (16). It is also imperative to regularly modify all training components (power development, velocity work, agility, technical throwing sessions)

Table 1: Example of a VSD 4-week microcycle with the hammer-winds.

	Warm up set (with eyes open)	Visual Sensory Deprivation (VSD) (all sets blindfolded)
WEEK 1	16lb competition hammer CW-CCW: (10+10)	16lb CW-CCW: (10+10) 25lb CW-CCW: (10+10) 35lb CW-CCW: (10+10) 45lb CW-CCW: (10+10)
WEEK 2	16lb competition hammer CW-CCW: (12+12)	25lb CW-CCW: (12+12) 45lb CW-CCW: (10+10) x 2 35lb CW-CCW: (12+12)
WEEK 3	16lb competition hammer CW-CCW: (12+12)	25lb CW-CCW: (12+12) 45lb CW-CCW: (10+10) x 3
WEEK 4	16lb competition hammer CW-CCW: (15+15)	45lb CW-CCW: (10+10) x 4 optional: increasing speed of swings every set to create a larger moment of inertia

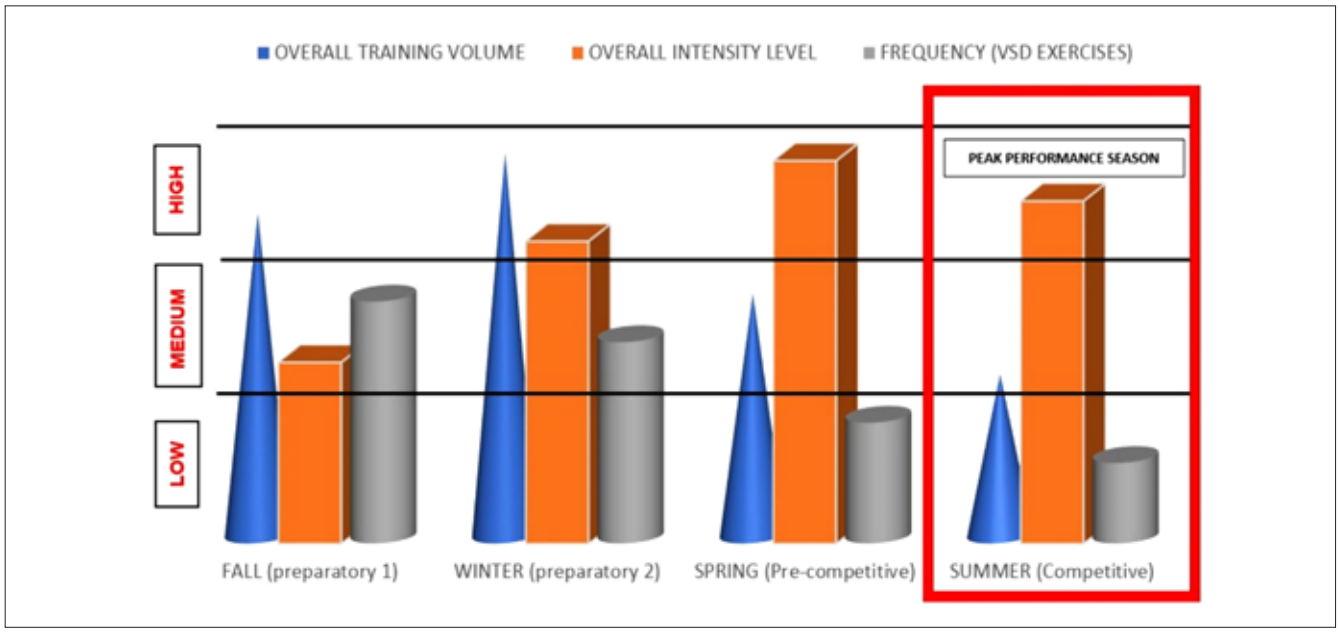


Figure 5: Relationship between the overall training volume & intensity level with the frequency of VSD exercises incorporated into a monocycle yearly periodization plan

throughout the athletic year (16).

When used as a stability-strength exercise, such as the hammer winds drill, VSD is best used in the general preparatory phase of a periodization yearly program (12). Figure 5 shows a monocycle yearly periodization plan for a hammer thrower looking for peak performance in the summer (competitive) season. The graph presents the overall training volume (strength-power training, throwing sessions, speed-agility movements, etc.) and the overall intensity level in relationship with a suggested frequency level of the VSD exercises method.

The overall training volume and intensity vary throughout the year. Typically, a higher volume in the preparatory phases and an increased intensity in the pre-competitive/competitive phases are usually prescribed (16,17). The graph also indicates that the frequency of the VSD training method should be fairly important in the preparatory phases, while allowing itself to slowly decrease towards the peak performance season as VSD attributes should improve after each of the three previous macrocycles (Spring, Winter and Fall).

Figure 6 displays various VSD blindfolded strength-specific resistance exercises typically performed by hammer throwers throughout a yearly periodization plan. These movements are only some of the multitudes of ways an athlete can increase his/her proprioceptive strength-specific system by augmenting appropriate neuromuscular dexterities associated to subtle and intricate actions (13).

NONVISUAL MOTOR TRAINING IN OTHER SPORTS

It is essential to realize that other sports can also benefit from nonvisual motor training in their respective resistance workout plans. If done safely and with the utmost level of proper coaching guidance (18), practical implications are virtually endless for all disciplines requiring balance, precision, power, strength and conditioning.

As discussed earlier, it is recommended to prescribe VSD strength-specific proprioceptive trainings to experienced competitors. Nevertheless, all athletic skill levels can benefit from the blindfolded approach when performing low intensity/event-specific techniques performed outside the weight room. Individuals with a blocked access to visual sensory data can still successfully develop muscular activity and movement coordination for postural control by using nonvisual motor learning (3).

Examples of blindfolded/low-intensity/nonvisual motor actions in other sports can include: standing long jumps in jumping events, block starts motions in sprints, or release drills in the throws. Practical perspectives of modified visual sensory

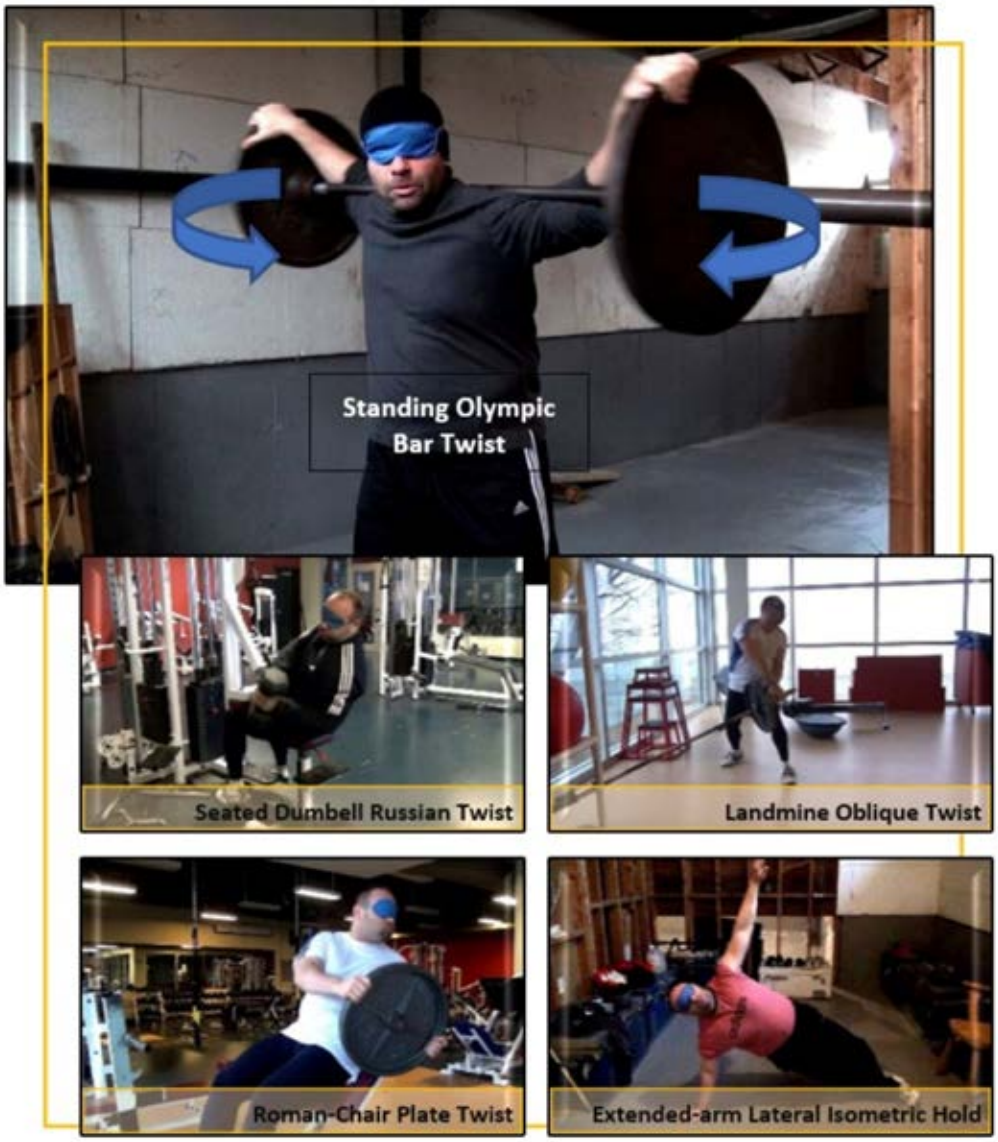


Figure 6: Various VSD blindfolded strength-specific exercises for the hammer throw.

training can go a long way with the creative mind of a dedicated and safety-conscious track coach (11).

CONCLUSION

Proprioceptive strength-specific strategies are seldom incorporated into an athlete's training protocol (20). Several coaching methods, while beneficial, may comprise the same actions repeated over a span of many years (10), thus resulting in a possible performance stagnation. Visual Sensory Deprivation (VSD) exercises, although atypical, offer the option to program the athlete's body while preventing the tedious aspect of standard strength or power workouts. The addition of a VSD protocol into a training methodology can increase the athlete's ability to accomplish complex motions more thoroughly.

It is important to underline the possible dangers and risks of using a VSD approach if the athlete is not properly guided by a qualified track & field coach (18). Maximizing strength potential is essential in performance enhancement, but the coaching staff should avoid skipping the basics as it could have a negative impact on novice athletes. This training method is definitely more appropriate for competitors who have reached their near-strength potential as opposed to beginners.

Planning a wide variety of resistance exercises can help the athlete achieve a decrease in the likelihood of injuries and overtraining, while increasing the prospect of attaining optimal results (16). Using a methodical attempt to incorporate some form of VSD scheme into a

strength and conditioning training system is currently not a widely used formula. A closer look into the visual sensory system and an in-depth comprehension of proprioception can assist track & field coaching professionals in expanding their training repertoire that could thrive and magnify their athletes' performances (11,14).

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ABOUT THE AUTHOR

Nils Oliveto is an Olympic analyst for CBC Radio-Canada television, a peak performance consultant/speaker and a physical education instructor at Lionel-Groulx College in St-Thérèse (Québec, Canada). He has color-commentated the summer and winter Olympic Games, including various World Championships and World Cups events, in both track & field and sliding winter sports (bobsled, luge, skeleton). He holds a Master of Science degree from the University of Oklahoma in Exercise Science with a research emphasis on periodization and training methodology. A former National Collegiate Athletic Association (NCAA) scholarship hammer-thrower in Oklahoma, he has also represented Canada in various international athletic meets. He earned his Certified Strength and Conditioning Specialist (CSCS) through the National Strength and Conditioning Association (NSCA) and was previously published in the Strength and Conditioning Journal. He will broadcast this year's 2021 Olympic and Paralympic Summer Games in Tokyo, Japan for CBC Radio-Canada Sports French channel.

TRAINING VS. REHABILITATION

BY RUSS EBBETS
EDITOR, TRACK COACH

We live in a world of dichotomies. And they are often of our own making. This either/or life has more than a twinge of self-preservation. With multiple choices, even countless choices, a moment's analysis can turn into an eternal paralysis. If it is either this or that, up or down, right or left we can make the easy decision and move on.

But maturity bring shades of gray. Politically you might identify as red or blue but with any sense at all you are somewhere in the middle. Even gender is not just boy/girl, man/woman anymore. At last count science has identified a spectrum of 36 sub-types, an alphabet plus 10. Training and rehabilitation are also a dichotomy. But for some they are essentially the same thing. Sets and reps, goals and achievements are shared components of the two disciplines that can lead one to conclude that, yes, they are the same thing.

What separates the two is intent. **Training** for performance is a series of stresses to the body. The intent of these stresses is to create a response that brings the body to a new performance level. This could be documented in an improved race time, more weight lifted or some other increase in volume, intensity or duration of physical work that would allow one to compete and train at the new, higher level. Even the recreational athlete training for general fitness, cardiovascular health or weight or mental stress management does so in a physical state where the athlete proactively pursues a predetermined goal.

The athlete in a **rehabilitative** state has a different goal, one of return. Rehab is classically defined as a return to a normal state for someone who has been ill or injured. It bears emphasis that one is returning to the "normal" state. While normal might not necessarily be pain free it would be without the movement restrictions of being injured. In a rehabilitative state the weekly or monthly training cycles geared towards improvements are put on hold.

Rehab is downtime, specifically a time where focus is shifted from training for one's performance goals towards regaining a degree of health and fitness that allows one to train for certain performance goals. And the greater problem here is that this "downtime" detracts from the cumulative lifespan of an athletic career.

The accumulation of downtimes might shorten an athletic career or at the very least hinder one's potential development.

Normal has been mentioned several times without a clear definition. Normal is really a nebulous term. In an athletic sense normal would mean different things to different people. What is normal for you may not be normal for me. Using normal in a people-sense the words "usual, typical or average" are nondescript enough as to be almost useless. In truth, Dr. Rodney Dangerfield's definition seems to work best, "The only normal people are those you don't know too well," and we'll let it go at that.

It is worth mentioning that at the developmental level training is neuromuscular *education* while rehab is neuromuscular *re-education*. This is not just "splitting hairs." For whatever the reason, be it poor personal habits, poor training habits (too much, too soon) or overtraining, what has resulted is a body breakdown where the body needs to be re-educated to the proper way. This leads to some deeper philosophical questions (what exactly is the proper way?) and also underscores the importance of a coach versed in the art and science of coaching.

With all this in mind below is a chart that dichotomizes training and rehabilitation very neatly (Table 1).

One of the fundamental principles of performance training is that of **conscientious participation** on the part of the athlete. Although seemingly a simple phrase it is complex in both facets and layers. Expectations differ greatly as one spans the age and ability levels of the Junior Olympian to elite to master athlete. It is not unreasonable to expect an athlete will face challenges that may be physical, psychological, social, interpersonal, intellectual or familial in his/her athletic career. But forced to describe the conscientious participation in a word, "intent," gives a neat summarization. Does the athlete understand the why's for doing the what's?

In a training phase one's intent would include challenging one's current limits with work and mustering personal resolve to do what is necessary to achieve these goals. The time-honored virtues of diligence, discipline, punctuality, sacrifice and the application of any number of other virtues help accomplish this goal. But along the way one can expect some bumps, difficulties and possible setbacks that will test one's resolve, one's ability to push through. This push will require one to leave a comfort zone to encounter the challenges with the resolve of "I can do this, I will do this." The hero's path is never a simple walk through the woods.

While both training and rehab endeavor to get one "better," better is defined differently by each discipline. Training strives for "better" through improved performances with proactive movement activities. Rehab strives for "better" with a return to normal performance, pre-injury through reactive movement activities. Both involve movements, movements with different intents.

There are inherent risks in all athletic activities whether we are talking about ball and team sports, contact and collision sports or the repetitive motions of running. Prevention in the form of pre-hab training efforts should address a sport's idiosyncratic problem areas to help mitigate the risks. But if and when an injury occurs the focus shifts to rehab activities that promote a return to

TABLE 1

TRAINING OBJECTIVES	REHABILITATION CONCERNS
Neuromuscular education	Neuromuscular re-education
Postural, core and dynamic **stability**	**Restoration** of ill or injured to "normal" state
Focus on movements over muscles	Focus on **muscles** over movements
Multi-lateral biomotor skill (speed, strength, flexibility, endurance, ABC's) development	**Focused** strength, flexibility, endurance, ABC's (no attention to speed)
Invisible training of muscles, joint capsules, ligaments, tendons, fascia	**Rehab** with pain-free range of motion of muscles, joint capsules, ligaments, tendons, fascia
Whole action - technical development	**Part action** – attention to weak/broken links
Testing for progress and development	**Testing for "return to play"** concerns
Allows for growth and development	**Delays** growth and development

normal and an eventual resumption of performance goal-directed efforts.

It bears repeating that injury downtime, as little as one month a year, can prove to be the loss of 10-12 months of training over the course of a career. That is 10-12 months that do not contribute to achieving one's potential. It is time that has been lost, never to be regained.

It might be seen that the difference between training and rehabilitation is merely semantic, but it is more than that. Dichotomies offer a simplistic view of the world. Nonetheless they are necessary in that they require a choice and subsequent action that will move one from an inactive or unproductive state towards making something happen. This is always with the greater hope that the choice made is more right than wrong.

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LONGTIME UNIVERSITY OF OREGON COACH BILL DELLINGER PRESENTED 2021 USATF LEGEND COACH AWARD AT THE U.S. OLYMPIC TEAM TRIALS

Bill Dellinger, longtime University of Oregon coach was presented the 2021 USATF Legend Coach at Hayward Field during the U.S. Olympic Team Trials on Friday, June 25.

Dellinger was previously inducted into the Oregon Sports, USTFCCCA, and USATF Halls of Fame.

A cornerstone of the modern University of Oregon track and field program, Bill Dellinger was one of the most respected American distance running coaches during his 29 years at the school. His Oregon teams won four NCAA cross country titles and a track and field championship, but it was individual stars such as Steve Prefontaine who left the most indelible mark on the sport.

Dellinger was a talented runner for Bill Bowerman at Oregon in the 1950s, earning his first national title by winning the NCAA mile in 1954, and ended up as a three-time Olympian. Along the way he won two NCAA golds and two AAU titles and took the Pan American Games 5,000m gold in 1959 before he capped off his international career in 1964 at Tokyo with an Olympic bronze in the 5,000m. He set

L-R: USATF President Vin Lananna, USATF CEO Max Siegel, 2021 Legend Coach Award recipient Bill Dellinger, and USATF Coaches Advisory Committee Chair Kevin Reid. Credit USATF.

six American records, including three at 5,000m, and his personal best in that event came in the Tokyo final. During a stint in the Air Force, he set an American record in the 1,500m in 1958.

Starting his coaching career at Springfield's Thurston High School, Dellinger spent time at Lane Community College in Eugene and as an assistant for the Ducks before taking over the Oregon cross country head coaching role in 1969. In 1973, after Bowerman ended his years as the head track and field coach, Dellinger also took over that role and held it until his retirement in 1998.

In 1971, Dellinger's Oregon men won their first NCAA cross country title under his tutelage, adding three more in 1973, 1974 and 1977. The team's track and field title came in 1984 in the comfortable confines of Hayward Field, where they scored 113 points. Prefontaine won individual cross country golds in 1970-71 and 1973.

Selected as the men's distance coach for the 1984 Olympic Games in Los Angeles, Dellinger worked with many of the top runners in the U.S. during his career. He also mentored international stars like Brazil's Joaquim Cruz, the 1984 Olympic 800m champion. He has authored several books on running and training and has been a popular speaker at conferences and camps.

Dellinger is portrayed in multiple films dedicated to legendary University of Oregon Alum, Steve Prefontaine, including Prefontaine and Without Limits.

The USATF Legend Coach Award is in its seventh year and is selected by the USATF Coaches Advisory Committee. The inaugural award was presented to Hall of Fame Tigerbelle Coach Ed Temple in 2014, followed by Dr. Joe Vigil (2015), Tom Tellez (2016), Clyde Hart (2017), Brooks Johnson (2018) and Bob Larsen (2019).

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