

JAVELIN

NMTCCCA CLINIC JANUARY 25, 2020



PRESENTATION GOALS

- Get your money's worth today – coaches, throwers, programs.
- Provide something of substance. Up to coaches to fit into their programs.
- Elevate level of knowledge top to bottom with sound technique.
- Improve level of throwing throughout the state of New Mexico.
- Know that talent exists in the state – coaches need only guide it.
 - Of course, that's why you are here in the first place. Right?
 - Establish new school/state records.
 - Most important – to coach athletes of character.
- Leave with a better understanding and appreciation of the event.
 - Throwing is fun – even more so when implements fly farther.
 - Anyone here ever witness a JAVA gun? Learn from the FLIGHT!
- Hope your practices become more efficient, FUN, safe and save TIME!
 - Could not have successfully done this presentation five years ago. Did not understand nor appreciate HS TIME constraints.
- Believe these are proven methods developed over five decades.
- Hope to share some insights – concepts you may have never considered.
- Hope you establish goals for yourself and your throwers.
- Hope you will listen and feel free to ask questions.



STRETCH REFLEX



- **Javelin throwing can be summed up in just two words – stretch reflex.**
- **Audience participation – warmup stretching fingers as in the slides. If you have hypermobility – metacarpo-phalangeal joints or arthritis in hands may want to bypass this exercise. One thrower at AFA could press his fingers back to his wrist. Told him that he would never be a shot putter.**
- **Additional warmup – place left hand on your thigh. Move left index finger up and down as fast as you can with as much range of motion as possible.**
- **Next – keep left hand flat on thigh. Lift left index finger off thigh while keeping the rest of your hand on thigh. Pull left index finger back with your right index finger as far as you can go and then let go.**
- **Of those two exercises which one exhibits the greater force? Which one took the least amount of energy? Merely reflexive right? Was not forced, but created significant force. That's javelin throw in a nutshell – just a matter of timing the body parts up correctly.**
- **Imagine Lord of Rings' catapult - only moving!**



T-POSITION

- **Arms straight out @90 degrees**
- **Rotate throwing hand over**
- **Rotate non-throwing hand**
- **Rotate both hands clockwise at the same time – increase speed**
- **Balance – on each leg**
- **Walk-Jog-Crossover-Alternating Crossover-Carioka (Arms still)**
- **BALANCE!**



GRIP AND PLANT

COMPARE THOMAS ROHLER

https://www.youtube.com/watch?v=3WFq_bVGYIXU

GRIP @2:01 – 2:16 – 2:57 – 3:05 please note official certification marks on front of javelin cord

PLANT @3:49 – Left foot landing- like plane going in for landing. Left knee slightly bent - allows time to activate the hip. Starts from ground up - chain link system. How to effectively PLANT - DTP? Repetition – redundancy!

<https://www.wikihow.com/Throw-a-Javelin>

“The American grip: For this grip, you have to place your thumb and the first two joints of your index finger behind the cord.” NOT

TWO WAYS TO SET UP LONG PULL & THROW



- **Set preferred grip. ELBOW ROTATION EXERCISE!**
- **Arm/javelin rotation about the shoulder**
- **Rotate palm slightly – javelin rests on thumb side**
- **Reduce shoulder and elbow injuries – breaking pane of glass example. Elbow wt rm exercise.**
- **Quick rotations – repetitions so feeling becomes natural. Throwing hand over foot.**
- **Shoulders square to direction of throw and reach back with hand. Use wall as needed to increase range of motion and flexibility.**
- **Throw out of these movements beginning with standing throw, to jog, to run, to crossover, et al . Standing throws. Javelin tip closest to a target wins. Leaves on the grass make excellent targets (balloons?). First thrower to five! Emphasis on hand going to the target! Throwing hand rotates counterclockwise – thumb turns down and out.**
- **Begin to incorporate plant depending on thrower's comfort level.**



DTP-DTP-DTP THROW

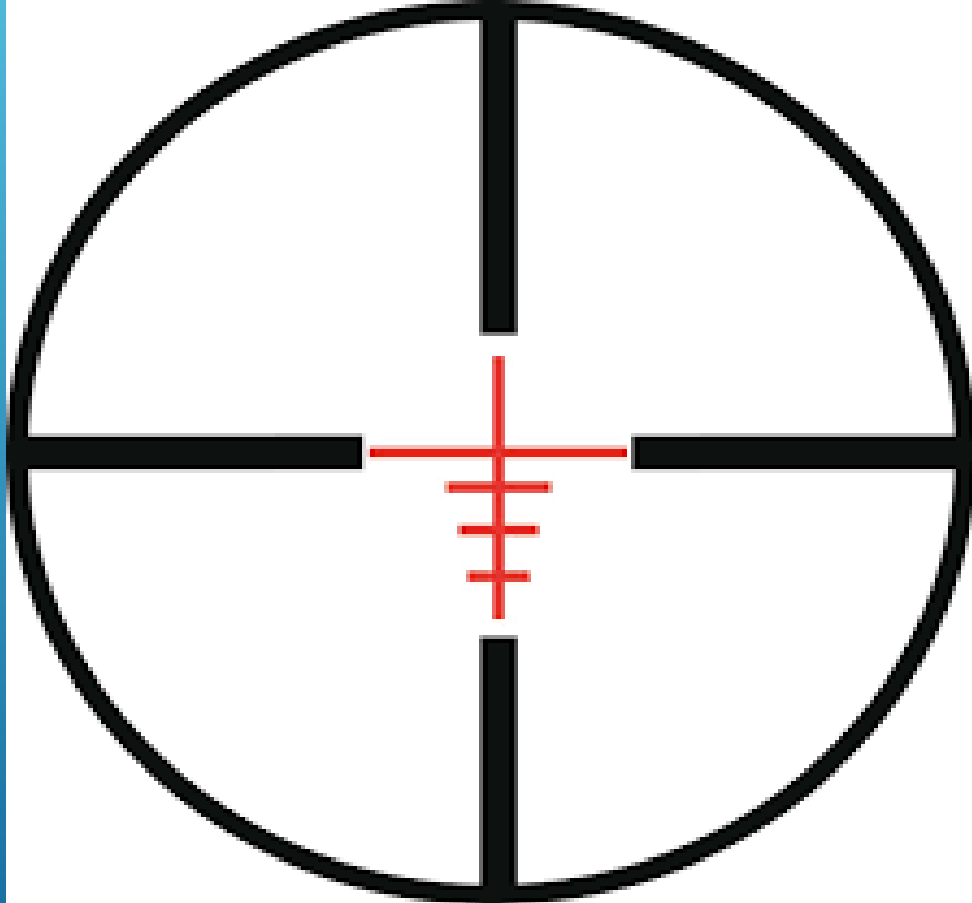
- **PROGRESSION** – Stand straight on - step to plant, walk to plant – coach adds a little push in back so thrower will plant more solidly catching forward momentum. Single legged hop to the plant!
- **SET UP** – Weight over Center of Mass (COM). Heel toe position.
- **Slight bend right leg and shift weight back. Arms in T-Position. Left leg out halfway to plant. Drop right knee slightly & drive off the right leg – extension/ push – right foot pivot. At the same time shoulder rotation begins. Armpit to the sky.**
- **Left arm action creates stretch across the chest.**
- **Left hand movement like turning door knob counterclockwise and makes a fist. Left arm locks in to the thrower's side.**
- **Left arm is not a violent block action. Concentrate more on staying back with throwing arm and SEE javelin tip at release.**
- **Think of javelin throwing motion like windmill or Ferris wheel (over the top). Block arm rolls to side – not shot put or discus motion!**
- **Low shuffle D-T-P! Left leg out – get down quick! Heel- toe position – how to set it up. Jump up step out. Valgus effect. Why so critical? Establish proper chain, increase stretch-reflex/power and reduce injuries.**



BLOCKING FIST

- **Dana Pounds-Lyon bronze sculpture (Summer 2017). Black belt in Karate.**
- **One little detail the blocking fist. Is it really that important? Actually, yes it is! Underscores the explosiveness!**
- **Solid flexion of muscles in left side helps block and lock in the plant and transfer power to the throwing arm. Total body throw. Not just the throwing arm. If one segment is weaker – throw is weaker. **BALANCE OF POWER!****
- **<https://www.youtube.com/watch?v=uwyltmUR3MU> Base of sculpture with words from line in the 1981 Academy Award winning movie, '*Chariots of Fire*'! Be fired up to throw!**

THROWING PROGRESSIONS



- **Low shuffle D-T-P and throw**
- **Straight on run to plant and let javelin pop out of hand. Surprising just how far javelin can fly like this without reaching back to throw. Hand stays above shoulder.**
- **Same as above, but reach back with javelin keeping shoulders squared to the throwing direction. Most throwers will want to turn sideways. CAUTION and WARNING – go easy with this concept. Can be tough on thrower's back. For more advanced throwers! Can also use medicine ball to generate this feeling.**
- **Four NO-NOS of throwing the javelin. Pushing up on the back end – pulling down on the javelin – throwing across the body – round house . Think of sight on gun scope. Use old javelin for this demonstration. If thrower struggles with pulling down have them chase after the throw with the throwing hand and leave the hand out in the throwing direction, but only on a few throws.**
- **Three step approach**
- **Five step approach**
- **Full approach – twelve step**
- **Sprint drills to approach – javelin is a sprint event. Develop maximal controllable speed. Incorporate higher knees and pawing (negative speed). PUSH-PULL-PLANT.**

APPROACH



- **Tight rope right - warm-up! Stay on line!**
- **Tight rope left. Body positions – left foot!**
- **Alternating tight rope**
- **Three step approach**
- **Five step approach**
- **Continuous first crossover**
- **Continuous last crossover**
- **Continuous alternating crossover**
- **Continuous carioka jav tip calm on face**
- **Full approach – twelve step**
- **Sprint drills to approach – javelin is a sprint event. Develop maximal controllable speed. Incorporate higher knees and pawing (negative speed). PUSH-PULL-PLANT.**
- <https://www.youtube.com/watch?v=0DQPcXKpspU>

WITHDRAWING JAVELIN RT FOOT TOUCHDOWN



- Withdrawal of javelin – like walking. 12 step approach after brief jog (rhythm). On seventh step begin drawing javelin back. Don't jerk javelin back – Relaxed movement over two steps.
- Hand follows javelin's angle of carry in approach which should be parallel to the ground or slightly down to attain T- Position at full withdrawal. Tip too high? Zelezny withdrawal. KISS principle. Palm up – not out. Why?
<https://www.youtube.com/watch?v=X2kF0sncZLE>
- After last crossover right foot touchdown occurs at completion of pawing action – negative speed – under body's COM (Push-Pull-Plant). Why? What happens if rt foot lands too far out in front? What is negative speed? Rt foot lands at ~45 degree angle from throwing direction. Why is that important? Why not 90 degree angle – couldn't that increase power from hip rotation? Yes and no! Tom Petranoff 1983 Pepsi Meet WR – wrapping (just shy of 100m). Roz Rouse 1984 Olympic Trials. Spikes in right heel of her throwing shoe. Find what works best for each thrower! Not a cookie cutter technique – basics!

MORE PLANTING



- Julius Yego (Kenya) – 2016 Olympic Silver. 2015 Beijing won World Championships set PB. Nicknamed “Mr. YouTube”. Why? Only 5’9” tall/187lbs. Encourage you to watch video. Become students of the event. Understand what the best throwers are doing and emulate, mimic, imitate, model them!
- Even best throwers can crush a plant. Left leg bent nearly 90 degrees. Negative bend in the javelin as result causes serious oscillation in javelin’s flight and increased drag coefficient. Whatever goes up must come down. Javelin flight follows angle of hips-chest-arm.
- Last crossover drive out, not up and get plant leg down quickly. Rhythm – bump... bump ...bump...bump-bump! Dana Pounds-Lyon right foot to left foot touchdown (plant) took twice as long as AMR holder Breaux Greer’s at 2007 USATF Championships. Quantitatively confirmed via Darfish software.
- Plant foot straight into the direction of throw – not turned in or out! REDUCE INJURIES! Pivot of right foot critical to applying force through the core.

BALANCE POINT THROWS



- **Notice how Miklos Nemeth's (former WR holder and Nemeth javelin fame) body is lifted up – elevated off the ground. Note left heel off the ground. This is a result of an effective plant.**
- **Imagine him holding this position (a bit like a non-reverse in shot-discus) - no follow through. With shorter approaches this is possible - *three step and not longer than five step**. And will give the thrower a much better feeling for the plant. Only a few of these 'Balance Point' throws are needed in a session to instill the feeling of a solid plant. A few light medicine ball throws with BP emphasis can also help.**
***Caution – use only 3-5 step – short approach distance with BP throws. Any longer can risk injury to back or plant leg.**
- **Remember slight bend in plant leg to allow hip to lock in (plant leg straightens in process) and then throw. Right leg elevates, but does not step through. Progress on to the pop-over.**

POPOVER



- Jorma Kinnunen – 5'9" tall 169lbs. 304' LTB.

<https://www.youtube.com/watch?v=c73gOBTm89c>



KINNUNEN STATUE

'THE' national event/sport in Finland!

MEDICINE BALL THROWS



- **Six Pack – Pony Keg**
- **Core and legs much more important than arms. Total body development in weight room. Snatch- Clean & Jerk. Problems with my shoulders today – doing heavy bent arm pullovers (3x 100kg+ @182lbs body weight) off high bench.**
- **Use partner or wall. If no med ball – use a basketball. Lots of reps quickly. Use time wisely. Technical emphasis on SOLID PLANT – HIP – LONG PULL.**
- **3x 10 reps Double Arm 3x 10 reps Single arm each – 3x 10 Alternating arms. Lawton-Illinois – blasted 4kg single arm MB. Progressively build up – be on the safe side and take it slow*.**
- **Can also have fun with CC – Cariokas – Tight rope – alternating tight rope, full approach and variations. Accelerate - fluid, precise, automated & proficient.**
- **If you have the TIME for kneeling throws and chasing after medicine balls, more power to you. At AA- tough to find the TIME. If so, may add some approach work with MB.**

COMPARISON ANALYSIS

2007 Javelin final Women



USA Outdoor Track & Field

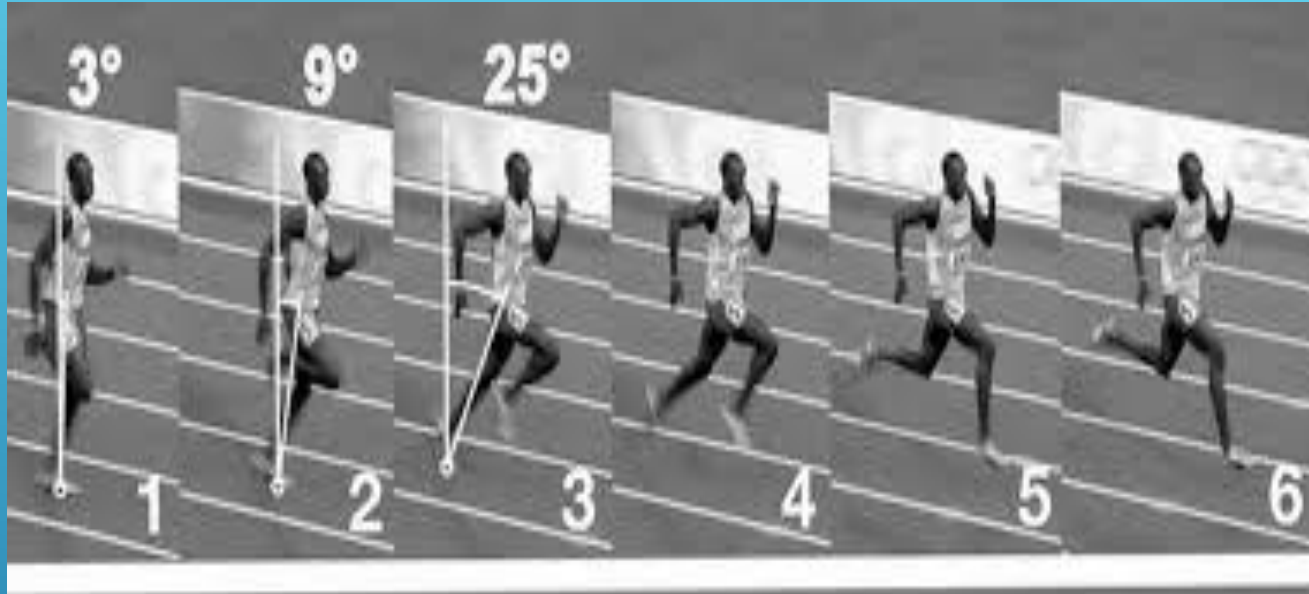
- **Dartfish – Coach’s Corner – use personal cell phone going frame x frame with YouTube on personal computer.**
- **<https://www.youtube.com/watch?v=1Zj4TILuk@15:29>**
- **Drill between throws in competition and practice – DO NOT SIT AROUND unless it is seriously warm temperature. Efficient TIME management.**
- **Prepare to be prepared. Baggies over javelins in the rain. No spikes back right heel. Spikes at 2006 NCAA Championships – rain in Sacramento – 1/4” limitation. Men’s NCAA leader from Texas A&M slipped on runway in qualifying round and out of the competition. Concentrate on one or two key technical points. Any more is mental overload.**
- **Relaxation – explosion are key.**

BACK TO BALANCE



- **Cannot overstate this point.**
- **Not leaning too far forward or back. Body weight balanced over COM**
- **Emphasis on balance with all technical exercises. Underscores the importance for repetition and redundancy of technical exercises. Most specifically proper set up of the throwing arm, i.e., placement of the javelin in the throwing hand, rolling the throwing hand to optimize the elevation of the elbow during the throwing phase, rolling the shoulder correctly to allow for maximum length of pull, stretch reflex and at the same time minimal strain on the elbow.**
- **Proper balance seriously helps to reduce joint injuries – knees, back, hips, shoulders, elbow (Achilles tendon for javelin throwers). One of the highest incidence of injury, if not the highest, for any track and field event. Imagine trying to throw a 100mph fastball like a pitcher, attempting to bring maximal controllable sprinter like speed into the approach and then planting/blocking as if you are running into a brick wall. This event is certainly not for the faint of heart.**
<https://www.ajol.info/index.php/ajpherd/article/view/154860> “The most common type of injury was the medial ulnar collateral ligament sprain, commonly known as javelin thrower’s elbow. The primary cause of injuries was poor throwing biomechanics that led to compensatory movement patterns, resulting in synergistic muscle dominance”.
- **Those who succeed at the highest levels are willing to sacrifice much to achieve their goals. PASSION!**

JAVELIN IS SPRINT EVENT



- **Best approaches in javelin use the best sprint mechanics.**
- **Higher knee action – pawing action – grabbing action – recovery action – rapid and powerful turnover**
- **Arm action – left arm across body – ~90 degree angle of upper arm to forearm – just in a different plane.**
- **Relaxed like a sprinter. See any strain in a sprinter's neck?**
- **Hips stay level. Did Usain Bolt's COM move up and down? Not much! Powerful, but very smooth down the track.**
- **Huge advantage to have a run-up. Only throwing event to truly have this phase. A shame not to take full advantage of this acceleration.**



JAVELIN SPRINT EVENT

<https://www.youtube.com/watch?v=kNv8Ti8BsHM>



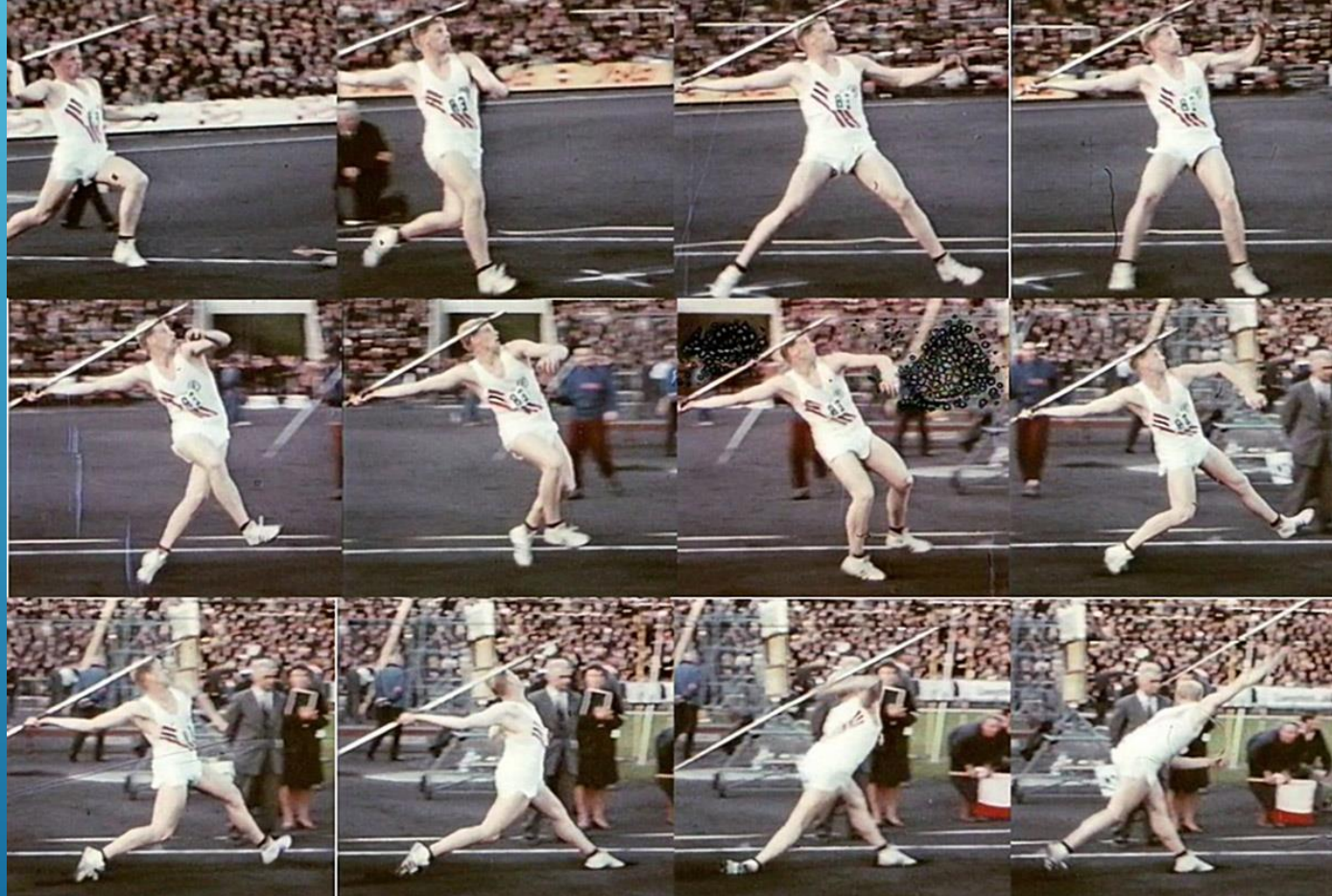
WHO IS THIS?

She was in shot photo yesterday!

An Olympian!

Still coaching!

What could she have done to improve technically?



FLIGHT

Flight is not measured by mere distance alone

Nor the speed of the athlete or the implement thrown

It is measured more carefully by the thrower's intent

Sharing and caring a spirit content

The spirit and majesty of flight even more is a goal in itself few dare to explore

My life has been touched and I hope your too

By the spirit of flight as in moments with you.

DSI Oregon 1980

PRESENTATION DEDICATED TO LOVING MEMORY OF CAPTAIN DAVID LYON



<https://www.fca.org/magazine-story/2016/01/13/blessing-in-brokenness>

https://gazette.com/premium/christmas-sharpens-the-anguish-of-loss-the-joy-of-friendship/article_c200d824-2273-11ea-941d-53e89cd548e5.html (December 21, 2019)

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QUESTIONS?

- Biomechanics study @Oregon 1977 of wheel chair javelin throw. Only three subjects – first paraplegic – second missing kneecaps – third had spina-bifida. Tedious process establishing X & Y coordinate points. Frame x frame! Crunched numbers by hand.
- Given that the subjects' were isolated - restricted to their chairs - they were obviously mostly upper body throws – little to no hip/core involvement. Study's conclusion underscored importance of length of pull & ability to stay with throw longer to achieve greater distance – back as far as possible - out as long as possible. Use that cue to this day!
- However, able bodied throwers cannot merely lean back farther to achieve a longer pull. Pull length is determined more by speed of getting the plant foot down. COM moving forward!
- *Additional note – also wrote frosh English paper on javelin throwing. Shows intense interest in trying to understand the event. More important to the research process, there was so little information available at the time (1969). Not much written about the event. Now there is an overabundance of information and some of it is not so good. Still you can learn more online!

