



Throwing the Hammer with the Ukrainian Swing

A Guidebook to the Technique



*Leading You Through the Steps, Carl Shields
With Original Help in 1975 From Yuri Sedykh*

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BookBaby

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Dedication

The orthodox thing to do is to dedicate a hammer throwing book to previous great hammer throwers. I thought about doing it, but I ultimately decided to dedicate my guidebook to my father, Charles "Hawkeye" Shields II.

In 1976, after Yuri won the gold medal in the hammer throw at the Montreal Olympics, a USA vs. USSR track meet was held at the University of Maryland.

My father borrowed a Super-8 camera and he, my brother and I hopped in the car and drove down to Maryland to see Yuri and film him throwing the hammer against America's Big Al Jackson.

When we arrived, the hammer competition had already begun. The stadium was swarming with security. The Cold War was still real and the Soviets were afraid that athletes might defect to the West. There were four Romanians and one Russian who sought refuge in Canada.

We soon realized that it would be difficult to get close to the circle and film the competition. However, the Iron Curtain politics and the guards didn't deter my father. We gave him a boost over the wall and he scurried, camera in hand, toward the cage. He was able to record several of Yuri's throws before he was discovered and escorted out of the stadium by a group of armed guards.

We vouched for our father that he was harmless and were told to leave the premises immediately. Go back home to Pennsylvania. Being unshaken by the incident, we headed around to the other side of the stadium where the Soviet team members were sitting. It was a slight detour on our way to the car.

I stuck my head through the opening in the gate and tried to see if Yuri was in the area. I was greeted by an "athlete" in a Soviet uniform and was asked, "What do you want here? I explained that we were here to see Yuri. He explained to me that Yuri doesn't speak English and wouldn't be able to talk to us. Hmm, KGB agent? Luckily for us, Yuri

recognized me and he came over. In English, he welcomed us to come sit with the Soviet team and watch the rest of the meet with them.

I think the KGB agent was a bit nervous, but we were surrounded by Soviet athletes including Aleksey Spiridonov. For some unknown reason, perhaps because my father heard that Yuri doesn't speak English, he decided to teach Yuri, the English word, "humid." After several attempts of saying, "huuu-miiid," while wiping sweat from his brow, I told him to forget about it. Maybe next time.

I'm not sure if I ever heard my father say this, but he did live his life this way, "It's easier to ask forgiveness, than get permission." I can't remember where the Super-8 film ended up, but I'm sure if we had iPhones at the time, we would have taken a lot of selfies with Yuri and the Soviet athletes. Maybe even a couple with the KGB agent.

Acknowledgments

These acknowledgments are specifically about this guidebook and not my throwing experience. I don't intend to slight anyone by omitting their name along with a thank you to them. So please, understand, if you feel strongly enough that I should have mentioned your name, and it'll ruin our friendship, then I'll gladly add you. Still friends?

First of all, I thank Yuri (a.k.a. Youri) Sedykh for all his great advice and kindness when we first met in Rome, Italy at the World University Games in 1975. It was also the first time I ever heard of anyone talking about an 80m hammer throw. Yuri was so positive about it, he had me convinced that he would do it.

Fast forward to 2019 and I also thank Yuri for agreeing to allow me to write this guidebook about my interpretation of his 1975 technique and allowing me to use his images.

Thanks to Stanislav (a.k.a Stas) Snyder, formerly Starovoytov, for allowing me to train with him at a local university. The drive by car was much shorter than to my previous training site in another state. And when I was legally blind, he picked me up and was my chauffeur. He also helped me by letting me help him learn to "throw like Yuri." At times, I can be unrelenting and come off as a know-it-all. I did it all in good humor. Stas, for his part, did make it "easier" for me by being stubborn.

I am also indebted to Dr. Vladimir Strelnitski, who co-authored a book with Yuri called, ***Art and Science of Hammer Throwing***. We met in northern New Jersey and he shared with me that he wrote the book with Yuri, because he wasn't satisfied with the published analyses of the hammer throw to date. Dr. Strelnitski, "being of the American spirit of rugged individualism," wrote his own. And in this spirit, I decided to write a hammer throwing guidebook for my local region.

I have to add another special thank you to Dr. Strelnitski, who shared his most valuable thoughts with me

while reading my guidebook. I have tried my best to include his comments, corrections and recommendations. Dr. Strelnitski is a perfectionist in every way.

My coaches at Cornell, Coach Jack Warner and Coach Tom Pagani, have always been supportive of my efforts. I owe them a lot. They even supported my effort to try to stop the University of Delaware from dropping their men's track and field program because of Title IX.

What can I write about my comrade, Herman Pinque? From the first day we met, he has been very inquisitive. Herm tells people that I'm some kind of a great hammer-throwing mind. He's the one who introduced me to Stas Starovoytov, (now Snyder), on this pretense. Coach Pinque will be my first "crash test dummy" for this guidebook. That is if he's willing to take on the mission. He'll learn firsthand, if I am an "expert on Yuri's technique."

Coach Larry Pratt and his lovely wife, Marlene, have been very kind to me. They are terrific people and great to their "kids" on the track team. I was allowed to train at their university and later helped with their hammer clinics for newbies. I don't think I'll lose my amateur status, if I divulge this, but I used to work for crispy orchard apples that Coach Marlene would bring to our clinics.

Hao Guan is a fine young man and now is also a husband and father. When he was a fifth-year student at a local university, he asked me, if I would work with him on the hammer. He wanted to throw like me. This was after four years of the "American technique" under his belt. I soon realized that I wasn't ready to actually teach someone. Throwing and teaching can be different skill sets. One act of redemption for me was, after hearing about his job situation, I was able to give him good career advice.

David Doupé, Joseph Bruce, Francesco Tataseo and I are best buddies. We were teammates at Cornell and still keep in touch. The throwers were known as the "Meathogs." We ate so much one time, that we were asked to leave an all-you-can-eat spaghetti night in Williamsburg, VA. I met my match one evening at Francesco's parents' home near

Pittsburgh. His grandmother was visiting from Italy and I bragged about my ability to eat. "Mangia Mangia!" After 5 heaping plates of freshly made fettuccini and red gravy, I thought I had lived up to my braggadocio. Then I found out that was only the appetizer. Mamma mia! Over the decades, they have had to humor me about my obsession with the hammer throw. I'm sure they thought I should get professional help. I did, but all the ink blots looked like hammers to me.

Steve "Bear" Sheely and Dave "Sluke" Kimble are fellow alumni of my ol' stompin' grounds. Bear's high school records in the shot and discus will probably last a thousand years. I thought one of Yuri's "secrets" was waffle-soled canvas tops. While I taught Bear some hammer technique before he went off to Happy Valley, I was wearing my Keds. Sluke was a hurdler who never missed a hurdle. With my hammer throwing advice, he and I were declared the keg tossing champs of Penn State. The contest was stopped when cops showed up after I tossed one over a hedge into the street. Unfortunately, Steve lost his grapplin' match with the bear.

Next to last, but not next to least, thanks to my brother, Charlie. He has been supportive of my efforts. I thought I should add him just in case he could decide to sue me if I didn't. He should also come in handy if this guidebook is plagiarized. He can sue them in court for me.

And, last, but not least, thanks to my dear wife, Susanne, who asked me daily, when are you going to write your book? She has been very supportive of my work. My wife also did the final editing of the guidebook for me. With her keen eye and red pen in hand, she is an excellent editor. After she's done slicing and dicing it up, there's nothing more to say other than, "That's all Folks!"

Preface

This guidebook is about my hammer throwing life, (not my entire life), and how just a few days of it made a big impact on me. Of course, my life has been touched by my wife, relatives, friends, teachers, coaches, teammates, co-workers and many others. But this is about the year 1975, and having had met Yuri Sedykh in Rome, Italy at the World University Games. My experience as an American hammer thrower was a series of unplanned and often surprising incidents and this was one of them.

In 1971, at the age of 17, I matriculated to Cornell University, high above Cayuga's waters in the Finger Lakes region of New York State. My first semester, I played freshman football. In the spring, I walked into the track office and said I would like to participate on the team. Coach Tom Pagani took one look at my discus and shot technique and then suggested that I try throwing the hammer. This was an implement that I had never seen before. There were very few resources for beginners at the time. I had a one-page sequence of the great hammer thrower, Anatoliy Pavlovich Bondarchuk, with no pictures of his winds. I took the hammer home with me that summer and practiced.

When I returned to Cornell in the fall of 1972, I played varsity football, starting at offensive tackle. In one game, I twisted my left knee. The team physician scheduled me for a knee operation at the end of the season so I could continue to play. I opted to take my chances throwing the hammer. I sent the head football coach my "letter of resignation."

In the spring of 1973, for reasons that I really can't explain, I qualified for the NCAA Division I Championships that would take place at LSU. I really wanted to go and I was granted permission, but I went alone. Due to a series of unforeseen problems, the trip was a disaster. I arrived, after many delays, in Baton Rouge at 4 in the morning. To make it short, when I walked onto the field to start my warm ups for the event, I was banned. I hadn't been registered. With the

help of my Head Coach, Jack Warner, I went in front of a committee to plead my case. I was finally granted permission, but, by then, the event had already started. Don't ask me how far I threw. To add insult to injury, my return trip was just as crazy.

Starting in the fall of 1973, I no longer had football practice and could concentrate on the hammer. I was still struggling with technique and experimenting with different winds. In '74, I qualified for the NCAA's again. This time I wasn't alone, our coach and several teammates accompanied me to Austin, Texas. I was "ready" for anything, but not for making the finals. I was so very happy and relieved. I rested before our last three attempts, while the rest of the field took their practice throws. To my astonishment, I improved my previous personal best by 10 ft. and placed 4th.

I still didn't totally understand technique and I was still muscling it. My senior year, I continued to use strength over technique and qualified for my 3rd NCAA's that would take place at BYU. My original coach, Tom Pagani had left Cornell for Illinois and Ted McLaughlin took over. As any new coach would do, when dealing with a senior thrower, he didn't make any suggestions to change my technique. This time I placed 5th and was the 2nd best American collegiate hammer thrower at the meet. I found out that I also "qualified" for the World University Games. "Qualified" needs to be qualified. American hammer throwers weren't known for their distances at the time and there was no plan to enter any hammer throwers for the States at the Games. With the help of many others, I persevered and talked my way onto the team.

For many of us amateurs at the time, we thought that competing after college was mainly for elite athletes. The rest of us looked for jobs or continued our studies, relegating throwing to a hobby or, for some of us, a passion. I thought this would be a once-in-a-lifetime experience. I remember an interview with a local newspaper, in which I explained that, at the international level, throwers are older, stronger and had much more experience. Most started at an early age of 12

or younger. In other words, I was saying I didn't have a chance of placing or even making the finals.

I was very happy when I arrived at my hotel in Rome, Italy. Once again, an unplanned incident occurred. After a training session, I missed the USA team bus going back to our hotel. As I thought about what I would do next, voices with Russian accents, beckoned me to get on their bus. They were members of the Soviet Union team. By an accident of genetics and our same hair styles and moustaches popular in the 70's, I looked enough to be Yuri's "brother" to the Soviet throwers. They thought it was funny when I stepped onto the bus. This was the first time that I met Yuri Sedykh. Yuri was as friendly as he could be to his "American brother."

After having said that international throwers were older, bigger and stronger than I was, it was obvious to me that Yuri was younger, shorter and weaker. But wow, he could throw. He was unbelievably fast or as he said, "speedily." We trained together and he shared a lot about his technique and training methods with me. What Yuri said was amazing, because I had never heard these ideas before. Many contradicted what I had been taught and what I thought were true. I was too inexperienced to question whether they were true or not. I was like a sponge, soaking up as much as I could. And when he said matter-of-factly, 80 meters would be possible, I believed him.

After I returned home, I tried out some of Yuri's ideas. But I soon realized that I couldn't mix dragging with Yuri's technique. I had even thought at one point, I could improve on his form by turning my right foot sooner. I sure had a lot to learn! Over the next decades of sporadic training and throwing, I gained more and more knowledge and experience.

In my 50's, I helped out, giving intro-to-the-hammer clinics for incoming freshmen at a local university. It was challenging and I always thought there could be a better way. After I turned 60, I finally put things together. One thing I was missing was the winds, I had made them too complicated. The other was the transition from the single to the double-support phase, I had placed too much load on my left side.

Now that I have a clear understanding of all of the key elements of Yuri's technique, I look around at age 65 and all I seem to see are 4-turn throwers. What happened to the fantastic 3-turn style that Yuri used to set the still-standing world record with?

In my opinion, Yuri's **simple** set of winds and 3-turns should be the best technique for American hammer-throwing novices, just like I was in 1972.

I can put Yuri's technique into four words: **simple, precise, safe and quick**. What sounded like contradictions to me, at the time, were just simplifications of what I was taught as being extremely complicated to learn. Never assume, because what may look like an action or voluntary movement to you is really a reaction or reflex.

In this guidebook, I'll share with you what I have learned about Yuri's winds and 3-turns. As Yuri told me in 1975, many Americans are too strong (in the wrong ways). So don't worry about spending hours and hours in the weight room pumping iron. You can use your time to get in the circle and enjoy throwing.

I hope, after having read this guidebook, you will look more favorably upon Yuri's 3-turn technique as an option to learn and master.

Thank you,
Carl Shields

1. Introduction

There are many ways to say keep things ***simple***. One we use in IT is KISS, keep it ***simple*** stupid. We'll drop the last "S" and just ***Keep It Simple***.

Origin of the Name, Ukrainian Swing

To begin with, you might ask, why did I call this the ***Ukrainian Swing***? When I had met Yuri in 1975, the Cold War was still hot. Yuri told me he was Ukrainian. A fellow athlete, whom I won't mention by name, complained that I was spending too much time with the "Commies." He was going to teach me a lesson. I told him that Yuri wasn't a Commie, he was a Ukrainian. My roommate may have thought I was mocking him. He proceeded to attack me physically and I gave him a lesson on Pennsylvanian wrestling. No, I didn't hurt him. But "Ukrainian" stuck with me. And, at that time, calling it Ukrainian didn't have the same "ring to it" as Russian or Soviet.

The following steps are based upon my observations and trial-and-error attempts and may not be how Yuri would describe them. My experience has been with American athletes, 18-20 year olds, who were seeing a hammer for the first time.

Please, also take into consideration, that when Coach Vladimir Ivanovich Volovik and Yuri worked together on their hammer technique, they were pioneers. They weren't following a well-worn path, but trail blazing their own. I'll be helping you along their path, not breaking new ground.

One of the terms that I use very often in this guidebook is ***SWING***. You may hear other people, including Yuri, say "***push the ball***." At least for me, "***push***" has a different meaning. When I hear it, I imagine things like "***pencil pushing***" or "***pushing a baby buggy***." On the other hand,

when I hear **SWING**, I picture swinging a golf club or a baseball bat. When you hear "**push**" from others, think **SWING** as in the **Ukrainian Swing**. If I were forced to choose, in our vernacular, I would rather be a "**swinger**" than a "**pusher**," if you catch my drift, man.

I'll use two new terms in this guidebook. The first is the "**neutral position**." The second is "**hanging**." These were introduced and described by Dr. Vladimir Strelnitski in his book co-authored with Yuri Sedykh called, **Art and Science of Hammer Throwing**, published in September, 2018. The **neutral position** is best described in the book, but I will simplify it. This position is when you're at about 0°, in your sitting position with the hammer, and all the forces on you are "zeroed out" so that you can turn easier.

We all know the word "**hanging**", but in the context of the hammer throw, this is a split-second pause of the hammer ball as it passes its high point. Another analogy given by Dr. Strelnitski is the "**hanging**" of a basketball player jumping up and "**hanging in air**" when making a dunk shot.

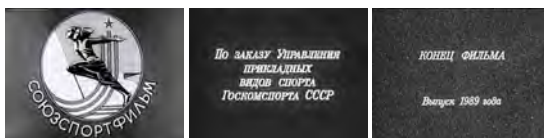
My use of two-thirds of the final speed is also from the same book. Page 27, "Although an experienced thrower creates about 2/3 of the final speed by the end of the entry into the first turn."

When I use "**center of gravity**" of your body, it's not too scientific. It can change as you move and I don't want this to be about how to calculate each person's center of gravity. For this guidebook, it's just a simple reference to an area near your navel. It can be higher or lower, inside or outside of your body at various times. The abbreviation, "**CoG**," will be used in the text for center of gravity.

The hammer throwing film clips are all from a Soviet era film, Soyuz Sport Films except for the pike position of Yuri's early technique. I really can't remember where I got these.



The weightlifting film clips are all from a Soviet era film, too:



The picture of Discobolus is from Wikipedia. I understand this source is open to the public.

This guidebook's cover page picture is from a cover of **Legkaya Atletika**. I photo shopped it to remove the lettering.

The patch of Ukrainian Republic was given to me by Yuri in 1975. I scanned it for the cover.

Yuri's picture in Figure 4.20, showing the shoulder dip, is from a back cover of **Legkaya Atletika** with the line and arrow drawn in by me.

The picture of Yuri with **Swing, Swing, Swing, Swing** on the back cover is also a cover from **Legkaya Atletika** which I photo shopped to remove the lettering and cropped the picture.

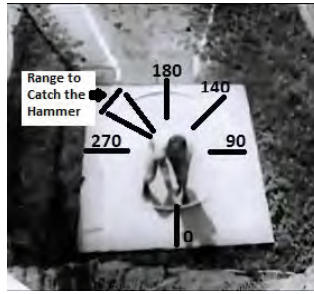


Figure 1.1: The 360° Hammer Circle, Soviet Era film on hammer throwing with my points added.

To set ground rules for some of my terminology, I've divided the hammer circle into 360°. Figure 1.1 shows the points marked off in a hammer circle. The back of the circle facing away from the throwing sector is 0°. Going counterclockwise, the next point is 90°, also a right angle. The following point is 140° situated between 90° and the next point at 180°. 180° is half of the circle. There is a range designated in which to "**catch**" the hammer at each double-support phase. The last point is at 270°, three quarters of the circle.



Figure 1.2: Double-handled wire, DHW.

A double-handled wire, DHW, is something I made from a broken wire and two hammer handles. I thought it would be easier for two athletes to hold on to each other than grabbing on to each other's wrists. This will be used to help you feel your **neutral position at 0°**, your **balancing position at 90°** and how to **walk** from being on only one foot [your single-support] to two feet [your double-support]. Additional use of the DHW will be showing you the power of leaning back using gravity and your body awareness.

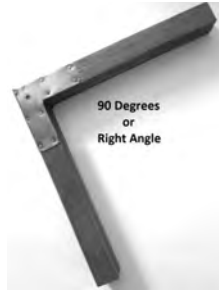


Figure 1.3: Right Angle Square.

To help us determine the angles of your hinge joints, I made a right angle or 90° angle square. We can use this to measure the angle of your knee bend, elbow bend, bend at your waist, and your shins at your **neutral position**. The hammer, when released, will travel at a right angle from your hands. Right angles are also important in determining the strength of a position. For example, when your knees are bent deeper than a right angle, your legs become "weaker." Think about how much weight you can handle with a quarter squat over a full squat.

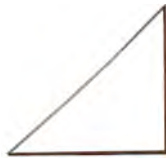


Figure 1.4: "Life-sized Triangle - 41° ".

To help novices get a feel for a 41° inclination, I made a "life-size" triangle with 41° as one of the angles. Yuri's changes in inclination, after I did a basic measurement with a protractor, looked like the Ukrainian Swing entry = $31\text{-}32^\circ$, then the next powerful pendulum swings, 41° , 43° and 45° . The changes are gradual. To take advantage of gravity's approximately 10 m/sec/sec acceleration, the hammer must be high on all turns as the right foot touches at the beginning

of each double-support phase. What goes up must come down. If someone wants to help a novice and says the first orbit should be flat, ask if a 41° inclination is flat. I would say, no, but it might be a matter of perspective. 41° , "flat" or "steep" to the observer, is the goal on completion of the first powerful pendulum phase.



Figure 1.5: Mop handle with ball, various types of brooms and rope hammer.

Drills can be very helpful for novices. They can get in lots of repetitions in a shorter period of time. A broom can be used to work on timing and also to clean the circle. A ball on the end of an old mop handle can work, too. "Rope" hammers can be made out of a piece of rope and a softball. The rope hammer can work well for learning winds.



Figure 1.6: 8, 10 and 12 Lb. Sledge Hammers, fiberglass handles.

Sledge hammers can also be used to help a novice feel the "**pendulum swing**." Sledge hammers come in different weights. I recommend an 8 to 12 lb. hammer with a fiberglass handle. If a novice goes ahead and tosses the sledge hammer, a wooden handle will soon break. And from experience, it's hard to remove the broken handle and replace it with a good wooden one that won't break quickly.

Water Drop, Not a Rigid Triangle

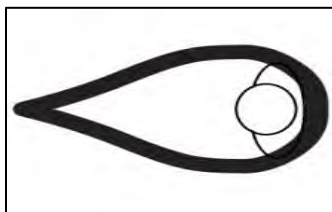


Figure 1.7: Water Drop not triangle. Figure 1.8: Shoulders forward, not held back.

You may hear that you should make a strong, rigid triangle with your hands, arms and shoulders. Your shoulders have the most flexible and mobile joints in your body. To hold your shoulders in a straight line is difficult to maintain. I describe the position like a drop of water, with your shoulders rounded, rotated forward and not held back. Figure 1.7, shows my concept of a **water drop**. Figure 1.8, is an overhead of Yuri in his **water drop** position with his shoulders, arms, head and hands.

Straight Back Means Not Curved

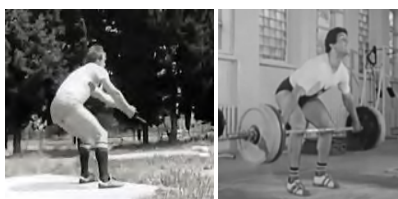


Figure 1.9: Straight back, not curved.

When I describe a straight back, it doesn't mean being straight up and down. Instead, I mean you shouldn't curve your back. An example is doing a snatch lift. To reach the bar, you need to lower yourself by bending your knees and bending at your waist. Your shins are back away from the bar and your legs and hips are positioned like you are sitting back. Even though you're bent at your waist, your back is nice and **straight**, not curved. Figure 1.9 shows Yuri in his sitting position with the hammer and a weightlifter in the lower

phase of the pull of his snatch. You can see the similarities of a straight back and vertical shins.

How to Grip Your Hammer Handle



Figure 1.10: How to grip a hammer handle for a right-handed thrower.

One of the first things a novice is shown is how to grip the hammer handle. A right-handed hammer thrower wears a glove on the left hand and a left-handed thrower wears a glove on the right hand. The glove hand is the one that grips the hammer first and then the opposite hand is placed over it. Your grip should be like hanging onto a cliff by your finger tips for your dear life. Don't squeeze the handle tightly or feel a tightness in your forearms or shoulders. Sometimes it's been described as holding an egg without breaking it. Figure 1.10, is Yuri showing how he holds the hammer. This is without a glove so you can see where the handle should be placed on your fingers.

2. *Two Simple and Effective Winds*

After decades of trial and error, while I trained alone and at times worked with complete novices, I have decided the most important elements to master first, [in order to have a chance to "throw like Yuri"], are two **simple** and effective, winds.

To do something very quickly, it has to be as **simple** as a reflex; done without having to think about it as when we **walk**.

Yuri's two winds are used to set up your **Ukrainian Swing**. Each wind is different in small ways. The 2nd wind is gradually moved farther to your left from the 1st wind.

There is one caution about starting to learn the winds. They are **as easy as walking**, but I've observed that some people, when winding, lose what are called bilateral coordination and cross-lateral coordination. You may see this when experienced throwers do winds while walking down a javelin runway. They walk in a jerky fashion. This is walking like a camel. Instead of swinging the arm with the opposite leg, they swing the same arm and leg (right arm with right leg and left arm with left leg). There are exercises to help a beginner with this, but normally the novice will correct it after being made aware of the walking problem.

Here are the steps to learn a **simple** set of Yuri's winds. We'll start with the 2nd wind, because I think it's slightly more important than the first one.

Step 1: Opening the Window of the 2nd Wind

Start facing the back of the circle at 0°. Pick a stance [we will work on the stance for the hammer later] that feels comfortable to you. **Walk** in place with **relaxed** shoulders and let your arms swing naturally. Feel a **smooth rhythm**, not too fast, don't run, just **walk**. What is most important of all is to just let it happen, don't think about it.

After **walking** for a while, feeling **relaxed** while swinging your arms, put your hands together, [as if you're holding a hammer handle, see Figure 1.10], bring your right arm over your head with a 90° bend (right angle) in your right elbow. This will form the top and right side (your right) of a window. With your left arm, bend your left elbow slightly narrower than 90° pointing it in front of your left side. Use your left forearm to form the left side of the window created with your bent right arm.



Figure 2.1: Opening the Window of the 2nd Wind, front view from above.



Figure 2.2: Opening the Window of the 2nd Wind, side view.



Figure 2.3: Opening the Window of the 2nd Wind, front view.



Figure 2.4: *Opening the Window of the 2nd Wind, rear view.*

When forming your window, don't rotate your hips, keep them facing toward the back of the circle. Turn your shoulders only enough to form the window, no more. Your position will make it easier for you to **Ukrainian Swing** into the **neutral position at 0°**.

Looking at the examples above, in addition to creating a window, you'll see that your hands, forming the upper left corner of the window, are approximately above your left foot. This is also important for centering the hammer at the **neutral position**.



Figure 2.5: *Hands of the Window of the 2nd Wind above your left foot.*

Continue to drop your hands and join them in front of you and then create your window. Get a feel for where your arms are when forming the window. Feel your hands above your left foot.

That was the first step, the next is to prepare for the **Ukrainian Swing**.

Step 2: Closing the Window of the 2nd Wind and Serving up the Ukrainian Swing

Close the window you've created by moving both of your hands clockwise to collapse the top of the window. Straighten your left arm and bend your right elbow. Don't force your right shoulder back, just turn it enough to enable you to place your bent right elbow at the rear of your right hip bone. Be ***smooth and rhythmic***, not jerky. When your left arm is almost fully extended, make sure your right elbow is bent and your right palm is faced up like serving a plate of appetizers. Your left hand should be palm facing down. Your grip on the hammer handle will help you control the initial part of your ***Ukrainian Swing***. You won't keep your hands in this position, they will rotate counter-clockwise as you swing to your ***neutral position***. By starting with your hands turned, the handle of the hammer won't rotate in your hands. This will enable you to ***swing*** the hammer more ***smoothly and quickly***.

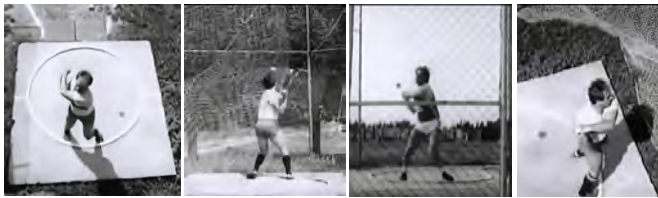


Figure 2.6: Left Hand (palm down) over Right Hand (palm down).

In the four angles of the "serve" in Figure 2.6, you can see how to hold your hammer handle with you left hand, palm down, over your right hand, palm up.

The following examples are of different viewpoints of closing the window of the 2nd wind.



Figure 2.7: Closing the Window of the 2nd Wind, rear view.

When tucking your right elbow toward the rear of your right hip bone, **turn only your shoulders**, not your hips, not your torso and not your head, **ONLY YOUR SHOULDERS**. This is necessary to help you serve up your **Ukrainian Swing**. To aid in turning your shoulders to the right, let your left foot roll to the inside of your foot and let your left knee collapse toward your center slightly. Don't force these movements. Just "react" to when your shoulders turn and by doing this, it will reduce the **twisting force** on your knee. Remember the winds are dynamic and you should **walk** with them, don't be rigid and stand flat footed, go with the flow.



Figure 2.8: Closing the Window of the 2nd Wind, overhead front view.



Figure 2.9: Closing the Window of the 2nd Wind, side view.



Figure 2.10: Closing the Window of the 2nd Wind, front view.

As you perform this "open window, close window" wind, you should keep your body motion below your

shoulders to a minimum. Your head should look forward the best you can. Your hands move the hammer and your shoulders turn to allow you to put yourself in a good position to serve up your **Ukrainian Swing**. **Keep it simple** and **precise**, no wasted movements.

Step 3: Opening the Window of the 1st Wind

As I stated before, there are two winds not just one. What you've done in steps 1 and 2 was to learn how to open and close the window of the 2nd wind. The 1st wind is used to set up the 2nd wind. The differences are minor, only **gradual** changes from the 1st to the 2nd wind.

Instead of opening the window completely across your face, you will open it about half way across. And instead of moving your bent right elbow, when closing the window, to the rear of your right hip bone, you'll move it to behind your right hip, like tucking it into your right back pocket. You will feel the upper-left corner of your window move from wind 1 to wind 2 farther to the left and over your left foot. **Keep it simple.**



Figure 2.11: Hands over inside of left foot on 1st window.

To closer approximate the beginning of the hammer winds, you can start with your hands to your right side, reach back while holding onto a rope hammer. Again, do not rotate your body the whole way around to reach back, try to do it with only your shoulders and arms and a slight turn of your torso.



Figure 2.12: Opening the Window of the 1st Wind rear view.

In Figure 2.12, you can see how to reach back with your rope hammer and bring your hands across your body to your left side and lift your hands up, half way across your face, to form your 1st window. Note how you should face the back of the circle with your head, shoulders and hips. Your legs will move only to enable you to form your 1st window of your 1st wind. Your hands will do the work for the winds. Be **smooth and easy**. Do not jerk the "hammer."



Figure 2.13: Opening the Window of the 1st Wind, overhead front view.

Figure 2.13 is an overhead view from the front. It shows you how to open your window at about half way across of your face. Pulling your rope hammer with your hands from behind your right side, you'll bring the hammer across your body to your left side with your arms slightly bent. Go no farther than your left side. [When you'll have a hammer in your hands, the hammer will lag behind you a bit. This is because your hands will move faster than the hammer.] Keep

your movements **smooth**, don't yank your hands in front of you, nice **rhythm**.



Figure 2.14: Opening the Window of the 1st Wind - side view.

From the side view in Figure 2.14, you can see how your 1st wind, [after moving your hands and squaring up your shoulders and hips], is performed in front of you, while you look toward the back of the circle. Almost no movement of your shoulders and hips. Leave your elbows slightly bent; don't straighten your arms as you wind your rope hammer in front of you,. Be **smooth and rhythmic**. There will be a delay for the hammer to catch up to your hands, be **patient** and wait. Again, don't jerk your hands trying to go faster. Each wind increases the hammer speed gradually.



Figure 2.15: Opening the Window of the 1st Wind, front view.

As you can see from the front view in Figure 2.15, you'll need to face the back of the circle and use mainly your hands to perform the wind. Keep your hips close to being centered. The only movement should be like **walking** in place. No wide swings of your hips. **Keep it simple.**

Step 4: Closing the Window of the 1st Wind

Closing the window of the 1st wind is similar to closing the window of the 2nd wind. The window will be a little farther to your right and it will be used to enter the 2nd wind and not the **Ukrainian Swing**. Your right elbow will go behind your back like tucking it into your right-rear-pants pocket. This is a gradual change to transition your 1st wind into your 2nd wind. As said before, be **smooth and rhythmic**, not jerky.



Figure 2.16: Closing the Window of the 1st Wind, rear view.

As you close the window of your 1st wind (Figure 2.16), try to turn only your shoulders, not your hips. Rotate your right elbow behind your back. Your low point in the 1st wind will be a little to your right. The hammer isn't centered yet. Your 2nd wind will **gradually** set up your **Ukrainian Swing**.

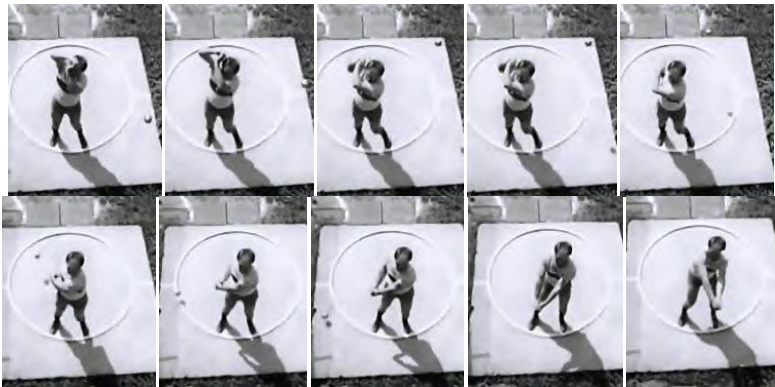


Figure 2.17: Closing the Window of the 1st Wind, overhead front view.

As you can see in Figure 2.17, your hands will be close to your right side as you move your right elbow toward your right-rear-pants pocket. As you move your hands across your body to your left, your arms will be extended slightly more

when starting to make your 2nd window than in creating your 1st window.



Figure 2.18: Closing the Window of the 1st Wind, side view

Looking at Figure 2.18, you'll see how close your hands are to your right side when you move them around with your right elbow bent and "tucked" in your right back-pocket. This closeness toward your right side will help set up your ***neutral position*** and center your hammer.

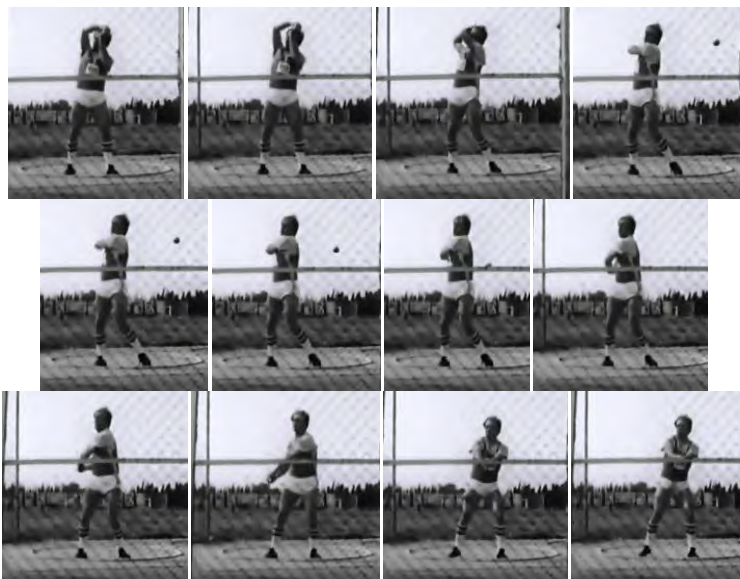


Figure 2.19: Closing the Window of the 1st Wind, front view

Figure 2.19, a view from the front, shows you how you turn only your shoulders to enable you to wind to your back. If you feel you need to, you can dip your left shoulder a little when starting to create your 2nd window. As you turn your shoulders back, let your left foot roll inward and your left knee collapse toward the center. Don't force your feet and legs movements, just let them happen. Do your wind ***smoothly and easily***.

Practice connecting your 1st and 2nd winds with ***smooth, rhythmic*** movements of your hands.

Some key words you can use to remember your winds are:

1st wind,

across half my face,
open the window,
close the window,
straighten my left arm slightly,
bend my right elbow,

right elbow in back pocket,
hands close to my right side.

2nd wind,

across all my face,
open the window,
close the window,
straighten my left arm more,
bend my right elbow,
right elbow to my right hip,
left hand over right hand.

After you feel more confident in your winds, doing the 2nd wind a little faster than your 1st, you can reduce your key words. Continue to do your winds until they feel ***smooth and easy***.

3. *Taz Hazad (Tas Nazat)*

I originally called this "hip anchoring," but, apparently, it was confusing to novices. So to make it even more confusing, Stas Snyder and I came up with a Russian equivalent, ***Tas Nazat***. It was easier to say, ***Stas, Tas Nazat!*** However, it was no easier for Stas to understand the concept and how to make it work for him.

I seem to use the word "important" for every element of the ***Ukrainian Swing*** technique. This element, ***Tas Nazat, IS EXTREMELY IMPORTANT*** throughout your entire hammer throw, starting with the ***Ukrainian Swing*** into your first ***neutral position at 0°*** and every 360° after it.

The Hammer is not Like Other Throws

Tas Nazat has its own separate chapter because many of you novices have thrown the discus, put the shot and/or thrown the javelin. In each one of these events, you are told to push or drive your hips forward. In the hammer throw, it's just the opposite. Pushing your hips forward will cause you to lose power, and in the worst case, be pulled off balance by your hammer.

A Short Lesson on the Forces Involved in the Rotational Orbit of the Hammer Ball

[Dr. Strel'nitski, who is a world famous astrophysicist, was very kind enough to read my guidebook and suggested that I explain the forces much better. The following has incorporated his suggestions about centripetal and centrifugal forces which are often confusing as to which one does what.]

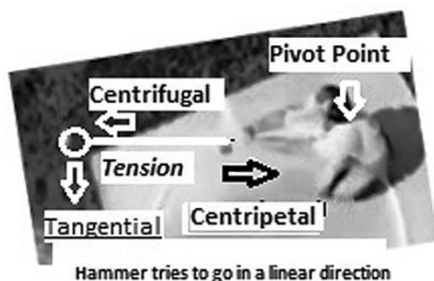


Figure 3.1: Forces on the hammer and the thrower

According to the law of inertia, the ball of the hammer will travel in a straight line without a force pulling it toward the center or pivot point. This force toward the center is centripetal which means seeking the center. The centering force keeps the hammer ball in an orbit circling the pivot point instead of it continuing to go in a straight line. In the hammer throw, reaction to the inward pull on the orbiting hammer ball is an outward force called centrifugal. This is a force that is sometimes considered a pseudo-force in physics, but, as Dr. Strelnitski explained to me, is an important force in analyzing the hammer throw. Centrifugal can be remembered as a **fugitive** running away from the center. The opposing forces create tension on the arms of the thrower and the hammer's wire. It's only when the thrower releases the hammer and the centering force is gone does the hammer fly in a straight line at a right angle or tangentially to the radius of the thrower's arms and the hammer's wire. [Although there is an outward pull, the hammer **does not** fly in straight line with the line of the radius. This explains why you'll release the hammer at about 90° and not 180°.]

The **Ukrainian Swing** technique requires a **quick** and **smooth swing** into your first turn. In some calculations, your **swing** speed maybe as much as two-thirds of your final release speed. When you learn to **swing** properly, you'll be creating a lot of tension on your arms and the hammer wire. This tension is a result of the action/reaction of the opposing forces of an inward pull, centripetal or center seeking force,

and an outward pull, centrifugal force. The faster you and your hammer go, the greater the forces. You'll not want to be **pulled off balance**, you'll want to stay "on balance." The hammer is a 360° event. At no point in your throw will you want to be yanked or jerked off balance by the forces increasing with the circular motion of the hammer's orbit and inclination.

The key to stopping you from toppling over is **Tas Nazat**, keeping your hips back during your throw and especially your left hip during your single-support phase. Throughout this guidebook, you'll learn to keep your **CoG** as far away as practical from your hammer ball. You'll **sit back, lean and fall backward**, and you should never move your hips and especially your left hip toward the outward pull of your hammer.

One of the times in your 360° rotations that you'll be most vulnerable to being toppled over is during your transition from your single- to your double-support phase. In the **Shortcut** chapter of this book, you'll learn how to **walk across in a straight line**. This **walk** will be used to get you into a stable position for your first double-support phase. This will be when your **powerful pendulum phase** begins. If you're off balance at this point, you'll not be able to recover as your speed increases.

Never Move Your Left Hip Toward the Hammer

It'll be important to understand that **at no time** should you move your left hip toward the hammer and this is also true with your **walk**. The **Shortcut** chapter will go into more detail. Keep in mind, as you **walk across in a straight line**, you'll want to move your left hip backward and downward, going in the opposite direction of your hammer ball as it rises to its high point at 180°. Your **walk** will be a **mini-fall**, your head leading with a **torso tilt** and your hips back. In other words, **TAS NAZAT** throughout your entire throw and never get pulled off balance.





Figure 3.2: *Tas Nazat* example for a three-quarter turn.

You can see clearly in this three-quarter turn in Figure 3.2 that Yuri keeps his hips back and especially how his left hip is opposite the hammer ball. When he centers his hammer in his **2nd neutral position**, he leans and falls backward, keeping his **CoG** and hips back. This increases the **tension** on his arms and hammer wire as he swings the hammer ball while it is also swinging downward under the influence of gravity. Remember to **Tas Nazat**. This advice is different from how you perform the shot, discus and javelin. In these events, pushing your hips forward is one of the keys to long throws.

4. *The Powerful Ukrainian Swing*

An essential element to your hammer throw technique is the ***Ukrainian Swing***. Never rush your set of two ***simple*** winds, they're very crucial for setting up the ***Ukrainian Swing*** so that it's ***quick and smooth***. The ***Ukrainian Swing*** will start while you're closing your window of the 2nd wind. As a novice, don't try to force your right shoulder back and around to start the ***Ukrainian Swing*** early. This may come in time as you become more flexible and proficient with the winds. What is important is that your ***Ukrainian Swing*** is powerful enough to move your hammer past your ***neutral position at 0°***, past your ***90° balancing position*** and upward to its ***high point at 180°***. At 90°, your radius with your arms and hammer wire should be very long. You'll need to maximize your effective body weight for balancing against the hammer. Your ***Ukrainian Swing*** should also be with a good initial inclination of 30° to 35°. This will enable you to move your hammer ***gradually steeper*** with each turn to an orbit inclined at 43° to 45° at release.

Your powerful ***swing*** will determine your "footwork" into your first turn. Your right foot will leave the surface of the circle about when you're turning past 90°. As you become more proficient with the ***Ukrainian Swing***, you'll be able to leave your right foot down longer. It won't be necessary to push off your right foot and drive it around to get ahead of the hammer. You'll use your right leg in balancing opposite the hammer and take a ***shortcut*** with your right foot to place it down again for the first double-support phase.

Two Entries for the Ukrainian Swing Technique

I think there are two entries in the hammer throw. The ***first entry is into the turns***, when you do your ***Ukrainian Swing*** and turn your body and ***CoG*** with the hammer. The ***second entry is into the throwing phase***, after your right foot touches down for the very first double-support phase. The

idea of two entries will become clearer as you feel the ***Ukrainian Swing*** propelling you into your first turn.

To review your closing of the 2nd wind window, it is important to have the proper grip on your hammer handle. As was described in serving up the ***Ukrainian Swing***, your left palm is down and your right palm is up, your left arm is long and your right elbow is bent at your right side.

The first point to consider, while swinging, is the ***neutral position at 0°***. This is your position that will determine your ability to apply force along the wire of your hammer. You will learn to sit back and center the hammer in the correct position. This will help you be the most stable throughout the throw. In what might sound like a contradiction, to move ***quickly*** through the turns, it's important that you're ***patient*** and ***wait*** for the hammer to be centered. When swinging, you'll need to feel your position dynamically, because you won't be stopping there, not even pausing for a split second. Your swinging hammer will determine your timing when you turn with it.

To help you determine your best ***neutral position***, first you'll have to work out your stance that will enable you to sit back "far enough." Sitting back is often described as sitting in a chair. Advice is often given that sitting back "too far" is better than not sitting back "far enough." This advice is hard to follow for a novice, who has never thrown a hammer before.

Ukrainian Pike Drill

The first thing you'll do is what I call the ***Ukrainian Pike Drill***. In an earlier phase of Yuri's technique, he started in an opened pike position when he threw. He looked like he was bent over at his waist to the extreme, almost like a competitive diver. Afterward, Yuri was said to have an unusually wide stance. Some have even described his pike position as a mistake that was later corrected. From my

studies of Yuri's evolving technique, there was nothing he did that was a mistake.



Figure 4.1: *Ukrainian Pike Drill for Determining your Stance.*

To adjust your foot width for your **Ukrainian Swing**, you'll get into a pike position. Start with your arms extended straight from your sides, about shoulder height. Bring your arms together and center your hands in front of you. Next, sit down and back as though you were sitting back into a chair while you bend at your waist into a pike position. If you have trouble doing this, stand up and start over with a wider stance.

Once you are able to get into a pike position while sitting back, the next step is to test out your ability to rotate **easily**. A **smooth** rotation will work with your **Ukrainian Swing** to enable the hammer's and your body's momentum to move you both past 90° and to 180°. This is important because your first turn will be relatively **passive**, propelled by your **Ukrainian Swing**, used only for setting up your **entry into the throw**.

Because your legs are attached to the rear of your feet, at your heels, you'll need to work on getting your shins and knees behind your toes. If your knees are too far forward, this will cause your **CoG** to be too far forward as well. While in your best pike position with your arms extended, try to turn from 0° to 180° without lifting up your right foot. If you are off balance or have to pick up your right foot, adjust your sitting back to place your shins at a right angle to the circle. Once you are able to sit back and do a **smooth** turn while pointing your arms first at 0° and ending at 180°, you will be

able to work out a better **neutral position**. It'll also make it easier for you to turn and leave your right foot down longer. Another benefit is it'll make it easier to **walk** across the circle in a **straight line** from your single- to your first double-support phase. Remember the **Ukrainian Pike Drill** is used only to determine the width of your stance and **is not**, I repeat, **is not** the way you should throw the hammer.

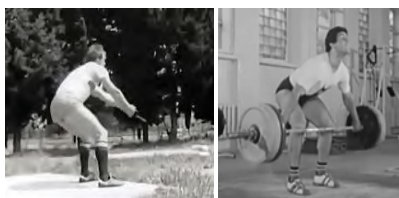


Figure 4.2: How to Determine your Stance.

As you can see in Figure 4.2, keeping your back straight and being able to sit back are fundamental. This, of course, is not a pike position, the **Ukrainian Pike Drill** was only to give you a good stance to be able to get into your best **neutral position**. Your final position will be more like Yuri's in Figure 4.2. If you think this is a "weak" position, take a look at the weightlifter, you'll see that his knees are behind his toes and his shins are almost straight up and down, at right angles to the platform. Yuri, with his hammer centered, looks very similar to the weightlifter. Although it may appear as if the two athletes in Figure 4.2 are leaning forward, they're actually sitting back and bending at their waist. This is an extremely strong and stable position.

After determining your best stance and **neutral position**, you'll want to give it another test to work on securing your most stable position. First, get into the position the best you can that Yuri is in (see Figure 4.2). Grab one handle of a DHW with your hammer grip (see Figure 1.10) and ask your partner to grab the other handle. Have your partner stand in front of you, get low to be at an angle and then try to pull you off balance. Your partner could even sit on the ground. You should feel a "strong" position at some point

near 0° . As your partner moves from side to side, on either side of 0° , it should be easier for your partner to pull you off balance. Ideally your centering of the hammer should be around 0° . Your first neutral position will be used for your **Ukrainian Swing** and not countering against the hammer. Once you've determined your stance, you can use it for any weight hammer and for any speed of entry. It's similar to your stance in doing snatches or squats. You don't change it for each weight on the bar, nor do you change it for fast versus slow lifts. This will help to make your entry less complicated, dare I say, *simpler*.



Figure 4.3 Working with a partner on the Neutral Position at 0° .



Figure 4.4 The Neutral Position at 0° from several views.

You can use your stance to sit into your **neutral position** and feel how high you should be and how much bend in your waist you should have while working with a partner using the DHW. Remember this position will be part of the subsequent **powerful pendulum phases** of the throw and needs to be very strong and stable.

Your Neutral Position Changes on Each Turn

Your **neutral positions at 0°** will change **gradually** on each turn as you **lean and fall backward** farther and farther. The first turn will be used to set up the next two turns and your powerful delivery. When you reach your next three **neutral positions**, you should have your knees bent so that you can extend your legs while **leaning and falling back**, turning to your **90° position**.



Figure 4.5: Progression of the Neutral Position at 0°, rear view.



Figure 4.6: Progression of the Neutral Position at 0° overhead front view.



Figure 4.7: Progression of the Neutral Position at 0°, overhead side view.

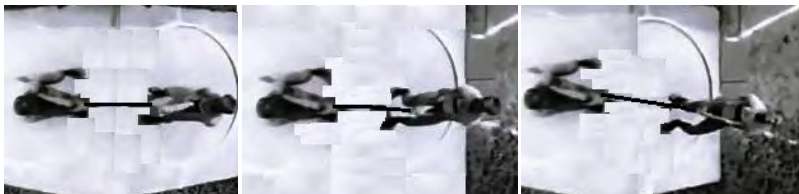


Figure 4.8: Feel the Progression of the Neutral Position at 0°, overhead front view

To get a feel for the progression of the **neutral positions**, you can use the DHW with a partner. Each grab a handle. While your partner sits down to be at angle similar to the gradual change in inclination and holds you as strongly as possible, get into your second **neutral position** and **lean and fall backward**. Keep your **CoG** as far back as in the first position. Don't move your hips forward, move your upper body back, maintaining your **water drop**. Use **gravity** as you **fall back** against the handle and your partner. Make sure you keep your knees bent. This will be necessary in order for you to use your legs as you turn with the hammer to 90° during the **upswing of powerful pendulum phases**.

Repeat this for the next neutral positions as you **lean and fall backward** more each time as the angle of the inclination increases.

Your Balanced Position at 90° Changes with Each Turn

The other position you'll need to get a feel for is at 90°. This will be important at the end of each **powerful pendulum phase** and especially at your delivery and release so that you can apply your maximum force without being pulled off balance by the hammer's opposite force.



Figure 4.9: The Balanced Position at 90° from several views

Getting a good feel for where you need to be for your **90° balanced position** before working on the **Ukrainian Swing** is critical. This is because you'll need to get a good feel for this position as you **swing** dynamically, letting the hammer's

and your momentum turn you past 90°, upward to 180°. You don't want to stop or even hesitate for a split second there.

Have a partner hold onto the DHW with you holding the other handle. Get on only one leg, your left leg for right-handed throwers, the right leg for left-handed throwers. Move yourself into the best **90° position** you can manage. This will be when you maximize your radius with long arms and optimize your effective bodyweight by sitting back against your partner. This should be when you line up your **CoG**, arms, hands and hammer together. Have your partner move from side to side to see if you can be pulled off balance. Let your arms and shoulders relax. Sit back as far as you "need to" and bend slightly at the waist. You should feel most stable on the back of the heel of your foot.

Your forward-leaning-head position will help make it easier for you to place your right foot down for the double-support phase. Your right foot will follow your head (your balance is controlled in your inner ears). This is a passive position, using **gravity** and your bodyweight against your partner. Do not pull with your arms or shoulders or try to lift up. Your first turn is used to prepare for your first **entry into the throw**, your first double-support phase.



Figure 4.10: Working with a partner to feel the best passive 90° position.

Heel-Toe Turn

This may be a good time to have you learn about the "heel-toe turn" with the hammer. You have determined that your best **90° position** is when you're on the back of your left heel. This will make it easier to do the "heel-toe turn."

Although it's called a "heel-toe turn", it's really more of a rolling onto the side of your left foot and then onto your toes. You don't turn on the ball of your foot. Rolling onto the side of your foot also helps you to continue to maintain your balance with your hammer during your single-support phase.



Figure 4.11: Close up of the "Heel-Toe Turn"

Don't force your left foot to roll on its side. By doing your swing forcefully, your swinging hammer will help you get onto the side of your shoe. Never force positions with your feet. Always time them with your hammer.

Leaning Back Farther on Each 90° Position

Why is your first 90° so far back, low and passive using your bodyweight and long arms to make the greatest force using **gravity**? This allows you to use your powerful back and legs on the next two rotations and the delivery. After your first **90° position**, during each subsequent turn, you'll **lean and fall backward** more and more until your delivery. The delivery

is when you release the hammer after converting **rotational momentum** into **linear momentum**; when you stop your body's rotation completely ("put on the brakes").



Figure 4.12: Progression of the leaning back each turn at the 90°, front view.

It may look like you'll need to move your hips forward. This is deceiving because it only looks that way. If you try to move your hips forward without leaning back, your hips will be closer to the hammer. This will reduce the radius of your hammer's orbit and reduce the influence of **gravity** on you. You'll need to **lean and fall backward** from above your **CoG**. Your **CoG** needs to remain as far back as when you started your first **90° position**. Note, looking at Figure 4.12, see how your head and shoulders and arms are at about the same height each time even though you're applying more force to the hammer. You can do this only by **leaning and falling backward** and not popping upward or pushing your hips forward on purpose.



Figure 4.13: Progression leaning back on each turn at the 90° with lines, front view.

Straight lines have been added to the sequence of your **positions at 90°**. These help you see how you need to learn to **lean back** as though you're **falling backward** to use **gravity**

along with your muscles. You can also see how you don't want to push your hips forward to form a reverse "C".



Figure 4.14: Progression leaning back on each turn at the 90°, over head view.



Figure 4.15: Getting a Feel for the Progression of the 90°, over head view

To get a feel for the progression of the **90° position**, you can use the DHW with a partner. Each grab a handle and with your partner, holding you as strongly as possible, get into your second **90° position**. **Lean and fall backward**, keeping your **CoG** as far back as in your first **90° position**. Don't move your hips forward, keep them back. Feel that you're **leaning and falling back** from above your **CoG**. Feel as if you going to **fall** down backward. A strong, stable position on your final **90° position** is required to have a fast, powerful delivery and release.

For those of you who lift weights, the delivery position is similar to the ending of a snatch pull, when you "lean back" and away from the bar to finish your pull before diving under the bar. This is just an analogy to give you an idea of the power of "leaning back."



Figure 4.16: "Leaning Back" while finishing the pull in the Olympic lift, the Snatch.

The hammer is a dynamic throw, every turn is a **gradual** change to achieve the maximum release velocity at the best angle of inclination. With this in mind, you'll learn the **Ukrainian Swing** to enter the first turn and feel the first **neutral position at 0°**. You'll then turn together with the hammer opposite your **CoG** to 90°. You should use your first turn only to set up the subsequent turns. You should be **smooth** and **rhythmic**. Don't try to kill your **Ukrainian Swing**. Imagine yourself swinging your hammer past 0°, 90°, 140° to its high point at 180°. Use your **Ukrainian Swing** to create a circular, inclined orbit with the hammer ball. Draw a big circle with your hands and hammer. Past 90°, the hammer will rise above your head as it climbs along an inclination to the 180° mark on the circle. This is the hammer ball's high point, where it will **hang** before it **swings** down to its low point at or near 0°.

When to Begin Your Ukrainian Swing

How soon should you begin your **Ukrainian Swing**? For now, only start it where it feels comfortable for you. Don't rotate your right shoulder back forcefully. As you close the window of your 2nd wind and your hands are in the serving position (left palm down, right palm up) begin a **smooth** swing with your hands (not your shoulders or hips) as you sit down and back and feel your best **neutral position**. Continue your **Ukrainian Swing** as you turn together with your hammer to 90° [let your hammer swing determine your turn timing] and feel your best **position at 90°** to balance against the hammer. When the hammer passes 90°, don't let

it pull you over for the time being. Let your swing go high to 180°. Your **Ukrainian Swing** should feel wide and circular. Your arms should feel loose. You should have your shoulders in a **water drop** position.

When you're ready, combine your 1st and 2nd winds. Toward the end of your 2nd wind, when you feel your position to serve, **swing** your hands and rope hammer in a wide circle as you sit back, **Tas Nazat. Smooth acceleration, not jerky.** Remember your **Ukrainian Swing** only sets up your first rotation which in turn sets up the rest of your throw. **Swing** your rope hammer forcefully, [**swing** for the fence]. You may think being slower may be better to center your rope hammer, but it's the opposite. Think about how you **swing** a baseball bat or golf club. Don't be timid, just don't jerk or yank your hammer as you **swing**. Your **swing** must be forceful enough to get your rope hammer, (and later real hammer), and yourself around to 180° with good height and inclination and a wide circular orbit. Don't rotate into your first turn too soon. Let your rope hammer swinging determine your timing and "footwork." Be **patient** until you center the hammer at your **neutral position**.



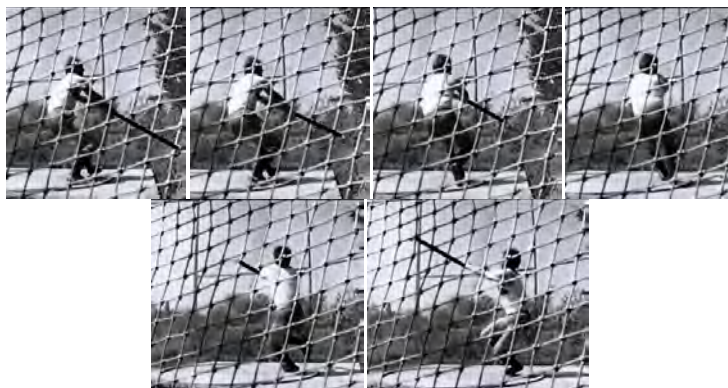


Figure 4.17: Ukrainian Swing, side view (lines added to see the wire).

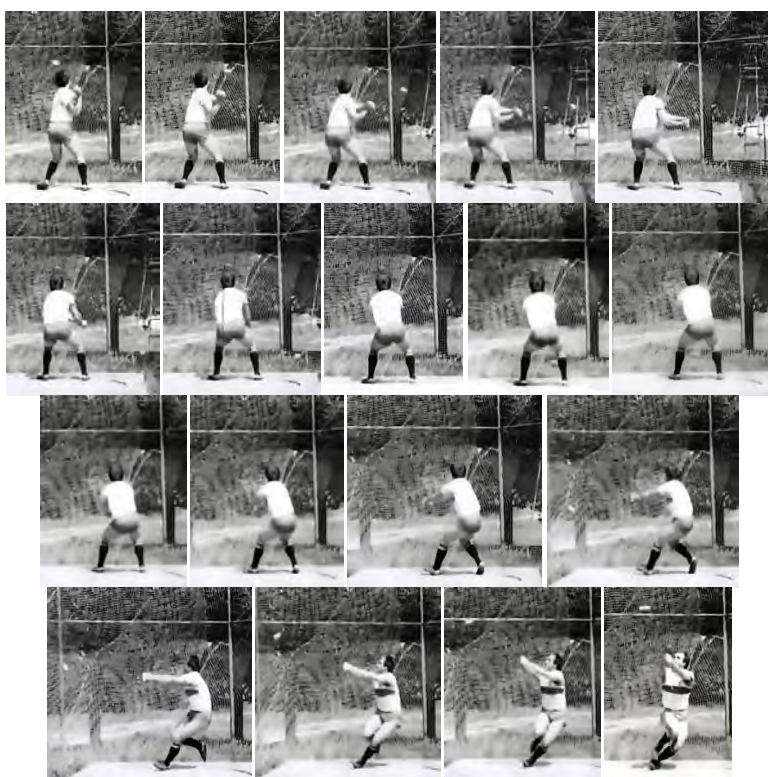


Figure 4.18: Ukrainian Swing, rear view.

Looking at the **Ukrainian Swing** from the rear view, Figure 4.18, you can see how to **swing** the hammer from your

serving position as you lower yourself into your first **neutral position at 0°**. Turn your shoulders back as well as you can. To reduce the **twisting** forces on your left knee, let your left foot roll inward and your left knee collapse toward your center. Don't force these movements, let them happen. Be **patient** until the ball of your hammer is centered opposite your **CoG**. From your **neutral position**, your **swinging** hammer will help you to your next important point at 90°. At this point is where your timing is important to have the rope hammer just right. Your hips are back and your arms are as long as possible. The additional pictures show you how high you'll need to **swing** the rope hammer to have a good inclination going into the **first entry into the throw**. Not only is the rope hammer above your shoulders, but so are your hands as you look at the ball of the rope hammer. This inclination will be important when you touch your right foot down in your first double-support phase. Also look at how you'll leave your right leg back, don't rush to get your right foot down. **Timing** will be important since you'll use your right leg as part of your balancing act on your single-support left leg. When you **swing** your rope hammer, make it **smooth** and **rhythmic**, don't jerk it. When you're learning, it's important to understand how powerfully you'll need to swing the real hammer.

During your winds and the entry with the **Ukrainian Swing**, you've been looking toward the back of the circle, not turning your head or hips. As you see in the sequence, you'll be looking at the ball of your rope hammer as you swing it to 90°. You'll continue to look at your rope hammer's ball during the rest of the throw. You shouldn't force your head into this position. You can only keep your eyes on the ball, if you've timed your **Ukrainian Swing** with your **CoG** as you swing your rope hammer from 0° to 90° and beyond. Remember, your head contains your balance in your inner ears. As we **walk** we "follow" our head and this is also true in the hammer throw. This will become more evident to you as you practice with a light hammer.

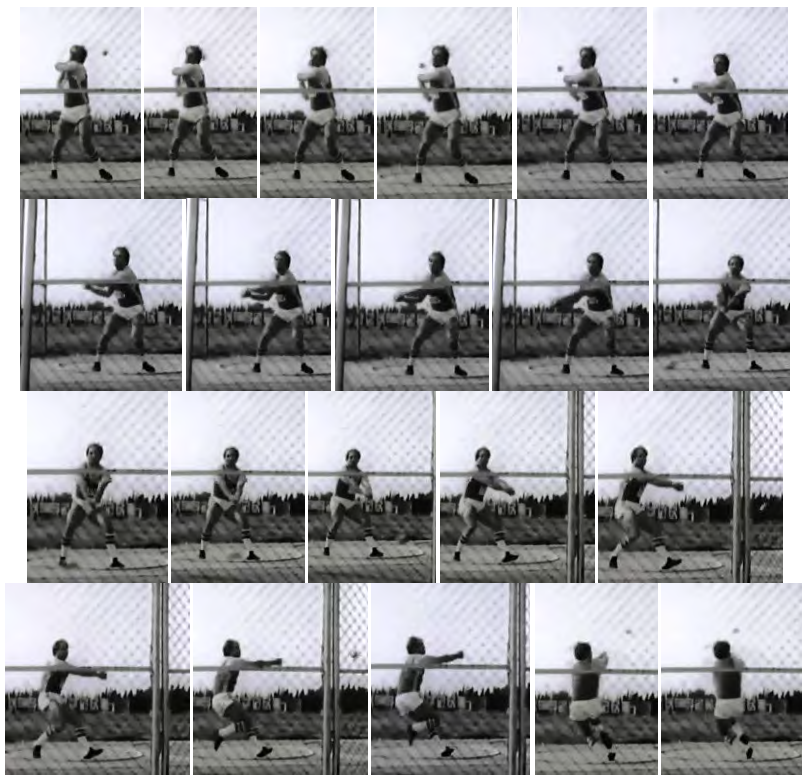


Figure 4.19: Ukrainian Swing, front view.

Looking at the **Ukrainian Swing** from the front view, Figure 4.19, you can see again, how important it is for you to lower yourself into your first **neutral position** and to be **patient** until your ball is centered opposite your **CoG**. Soon after 0° , as you turn with your **swinging** rope hammer, you should start to look at the ball. As you swing and turn with your rope hammer, the ball will rise up to your **90° position**. Keep your hips back, **Tas Nazat**, be on the back of your left heel, **relax** your shoulders, center your head, look at the ball and let your arms be as long as possible at 90° . Doing these things will be important as you continue your turns. At 90° on your last turn into your delivery, you will have built a good base. You will do this by keeping your **CoG** as far away as possible from the hammer ball. There is an old saying that you can't shoot a cannon out of a canoe. You can't throw your

hammer far if you're **falling** forward, because your position isn't strong and stable.

Dip Your Left Shoulder Down

Your **swinging** of your hammer **forcefully** will cause it to rise above your head as it climbs to its high point at 180°. From my experience, you may not realize how high and steep you'll need to **swing** it. This can be checked with a life-sized triangle, if you have one. I also recommend starting with a dip in your left shoulder while performing your **Ukrainian swinging**. This will help you change the angle of your **swing** to increase the inclination of your hammer's orbit. Instead of dipping, I've seen novices lift their left shoulder into the turn. This will result in at least two things: 1. Make it difficult to keep your eyes on the ball, and 2. Block your swing from climbing upward. **Dip it (left shoulder) down to go around.**



Figure 4.20: Left Shoulder Dipped Down

How High and Steep to Swing your Hammer?

When Dr. Strelnitski reviewed my guidebook, he thought my 41° is too steep for the **Ukrainian Swing** entry and he was correct. I used an old drawing to do my measurements and measured only the last three angles of the **powerful pendulum phases**. I couldn't source the drawing and didn't include it in my guidebook. I revisited the inclinations.

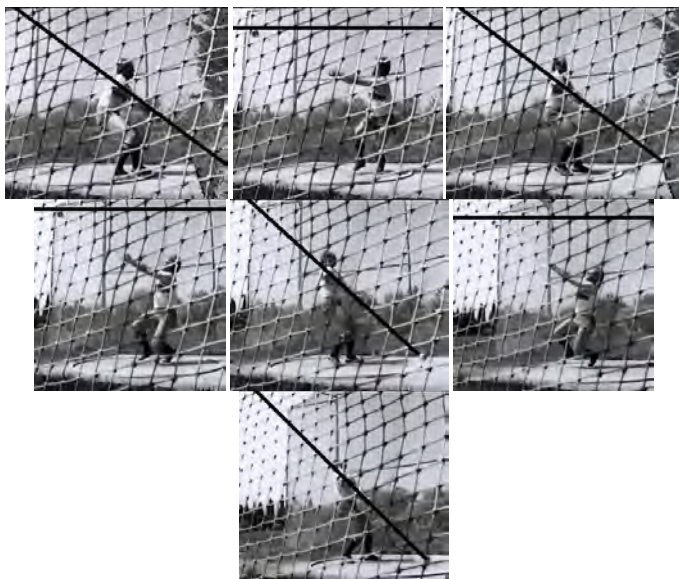


Figure 4.21: Inclination Changes on Each Swing

You can see in Figure 4.21 that the angle at the **neutral position at 0°** is steeper than the height of the hammer ball at 180° . This is most likely due to the affect of gravity on the rising ball. The **Ukrainian Swing** entry is about $32\text{-}33^\circ$ and the subsequent angles are $40\text{-}41^\circ$, $42\text{-}43^\circ$ and $44\text{-}45^\circ$. These angles are approximates. When the angle is 45° at the release, the horizontal and vertical forces are split 50-50.



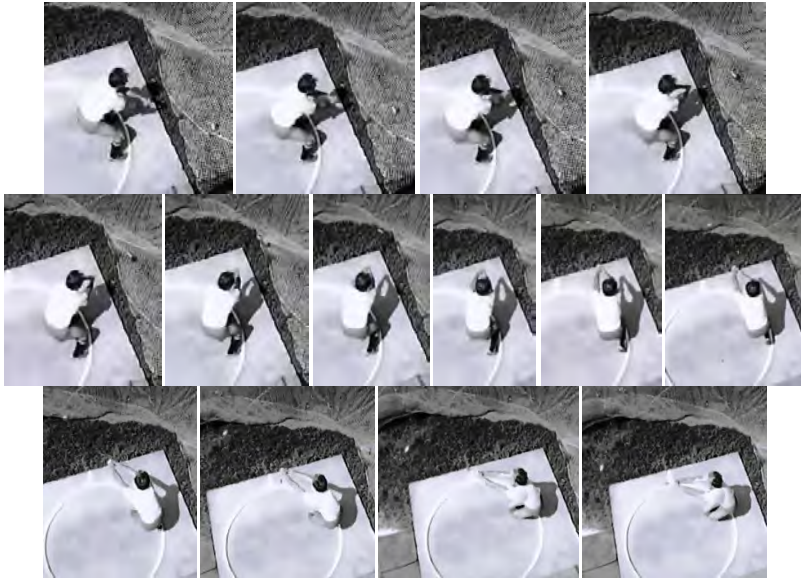


Figure 4.22 *Ukrainian Swing, overhead view.*

Looking at the ***Ukrainian Swing*** from overhead, Figure 4.22, you can see how you'll straighten out your right and left arms as you swing your rope hammer and lower yourself into your ***neutral position***. You can also see very well how you'll center the ball opposite your ***CoG*** and then turn with your swinging rope hammer to 90°. What is also evident from overhead is how you'll keep your eyes on the ball and keep your hips back, ***Tas Nazat***. Your long arms, centered head and ***relaxed*** shoulders will enable you create your ***water drop***. Your powerful ***Ukrainian Swing*** will propel your hammer around past 140° and upward to 180°. This momentum will help your first turn and will allow you to be passive while your ***Ukrainian Swing*** gives you a ride. This will create a strong foundation for you to continue your throw. Your ***CoG*** will be as far away as you can be from the ball. Your position will enable you to use ***the power of the pendulum, (gravity on the hammer and gravity on your body by leaning and falling backward*** without forcing your hips forward).

By this Time in Your Training

1. You have worked on your 1st and 2nd winds, making them **smooth and rhythmic**.
2. You have felt your stable **neutral position at 0°** with the hammer centered.
3. You have felt your long, relaxed arms and hips back, **Tas Nazat**, at 90°.
4. You have felt your shoulders **relaxed** with your head centered in the **water drop**.
5. You have felt your **forceful, smooth and rhythmic Ukrainian Swing** into your first turn.
6. You have felt **gradual** change, both in inclination and speed.

You should practice your winds and **Ukrainian Swing** until they feel **smooth and accelerated**. Make sure that you can feel your **positions at 0° and 90°** without thinking much about them. You should also think less and less of "footwork" and more and more of just swinging the hammer. Your swinging hammer determines your "footwork", not the other way around.

After mastering these elements of the throw, it'll be time to move on to the **shortcut** into your first double-support phase. Your first double-support phase is what I call the **entry into the throw**. It's different from the **entry into your first turn**, for which you use two winds and the **Ukrainian Swing**.

5. *The Shortcut*

The **shortcut** is a way for you to minimize the movement of your right foot when going from your **90° position** of the first turn to your first double-support phase. This first double-support phase is what I call the **entry into the throw**. The importance of having your two feet on the surface of the circle is to provide a stable base while first, your hammer **swings with gravity**, and then you **swing** it during the **Powerful Pendulum Phases**.

This **shortcut** also enables you to leave your right leg back longer, which gives you better balance against the hammer during your single-support phase. By leaving your right leg behind longer means that your right foot will have to move lightning fast. To do this, you'll want to change it into a reflex (stays local in your nervous system) and not make it a voluntary movement (has to travel to the brain and back). When you **walk** you don't think about what you're doing. It just happens without using your brain. This is what you'll tap into when working on your **quick** right foot.

Four Factors When Moving Your Right Foot

When moving your right foot from a single- to double-support phase, there are four factors;

1. Position of your head [when you **walk**, you follow your head],
2. **Tilt of your torso** down and left [this helps you lead with your head and not your hips],
3. **Tas nazat** of your hips [hips back during your **walk**],
4. Reduction of the load on your left hip by turning your body below your shoulders.

You can practice **walking** while moving your head forward and backward. When you lean your head forward it's like a series of mini-falls. Each time, your foot catches you

before you **fall**. As you roll your head backward, it's more difficult to **walk** forward without "reaching out" with your feet. Your body feels stable with your head above your **CoG** and doesn't sense that you're **falling**. By being reflexive with your **walk** from your single- to double-support phase, you also have less chance of disturbing the orbit or inclination of the hammer as it passes through its **hanging** phase at its high point at 180°.

Your **walking** will also be "**linear**" and not "**circular**" giving you a **shortcut** by moving along a chord instead of an arc of your body's rotation. The shortest distance between two points of a circle is a straight-line chord and not along the curved arc of the circumference.

This **walking** movement will also enable you to **tilt** more without forcibly bending and driving your left knee downward. When you turn everything from below your shoulders, this will relieve the **twisting** forces on your lower back and spine. It will also enable you to **catch** the hammer higher and farther back with greater ease. [*Note: I've had some feedback that some coaches may tell you that you're dragging the hammer. Leaving the hammer farther back and higher is not dragging. It sets up your **powerful pendulum phase**.*] You'll be able to do this by bending your body joints the way they're meant to be bent without adding a **twisting** force on them.

One-Legged Tilt and Walk Drill

A helpful drill for you to do is the **One-Legged Tilt and Walk Drill**. Stand on your left leg with your right leg behind you. **Tilt your torso** [shoulders and hips together] down and to the left while looking back toward your broom head or mop stick ball. As you're looking back and leading with your head, **tilt** more to your left until you feel you're going to tip over. Make sure your left hip goes back as you **tilt, Tas Nazat**. Then **tilt** just a little more and feel your right foot **react** to **catch** your **mini-fall**. This is like your **walk** across the circle leaving

your hammer high and behind you as your right foot touches the ground. You should feel your shoulders are **relaxed**. With your head centered, looking back toward your "hammer," there should be no **tension** in your shoulders. Practice this often to feel yourself **walking** to your first double-support phase.



Figure 5.1: One-Legged Tilt and Walk Drill

In Figure 5.1, [I had to do my own modeling], you can see how you'll need to tilt your torso with your left hip going down and backing away, **Tas Nazat**, from the "hammer". This will allow your head to lead and your right foot to "react" to regain your balance as you **mini-fall** and **walk across the circle**. You should be able to leave your "hammer" far and high behind you with your shoulders and hips tilted. In your first double-support position, you'll be ready to let your hammer **swing**.

One thing to note about your **walk** is that it takes advantage of your natural bilateral coordination. As you **walk** with your right foot going forward, this helps you to leave your right arm back. Your right foot and left arm **swing** forward together while your left foot and right arm are left behind.

You may ask, why **twisting** your joints and spine should be avoided, when throwing the hammer? Most injuries occur from "wrenching" or "**twisting**" your knee, ankle, hip or lower back. To demonstrate this, I take a strip of ordinary paper and pull on it lengthwise. It's rather strong. When I add a "half twist" to the strip and pull again, it rips easily. The force has been changed from **linear** to angular.

To demonstrate the difference between **twisting** your hips to try to have a quick right foot and turning your body from your shoulders down, you and a partner can use the DHW.

Rotate from Below Your Shoulders

Have a partner and you both holding the DHW at your best **90° position**. Make sure your hips are back, your arms are long, your shoulders are relaxed and you're looking at the hammer in your **water drop**. As your partner **walks** you around to 140°, try to move your right foot around quickly. You should feel the loss of the use of your right leg for balancing against your hammer.

Next, repeat the same procedure, but this time, leave your right foot behind and try to get your right foot around by **twisting** your hips first. Again, your partner should be able to stop you in your tracks, making it difficult for you to advance your right foot without "reaching out" with it.

Lastly, repeat the same procedure, but this time turn everything below your shoulders and **fall** into a **walk** toward 270° while tilting your torso and moving your left hip down and back, **Tas Nazat**, to lead with your head. You should be able to tilt yourself even more, by bending your left knee downward, and **catching your mini-fall** with your right foot moving reflexively under your head. Remember to try to continue to look at the hammer while in your **water drop** position.

After you feel comfortable "**walking your shortcut**" with your partner, you can try to add one more element that will help you get a little lower and **catch** your hammer a little farther back. Because you're turning everything below your shoulders, you will need to keep your shoulders and hips parallel as you **tilt** your left hip and left shoulder downward together while pointing your left butt cheek to where your right foot was when you performed your **Ukrainian Swing**. This extra **mini-falling** toward where your right foot was, will

also help with the speed of your reflexive response of your right foot, This will add more vertical separation between your **CoG** and your hammer. You being tilted more, will mean the hammer is relatively higher to your **CoG**. The importance of your vertical separation with the hammer will become clearer when you work on the **power of the pendulum**.

This explanation may sound like a lot of words, but once you've worked on it, it should become "**as easy as walking**," "**as easy as falling**" with "**no twist or torque**" on your joints or lower spine.



Figure 5.2: Shortcut, walking the line, side view.

Walking the Line

As you can see in Figure 5.2, when you time your right foot with your turn, you'll be able to **walk the line** across the circle to your first double-support phase. Try to move your right foot as straight as possible. Do not turn the toes of your foot inward or outward. **Walking** along a chord of a circle and not an arc, will shorten the distance you'll need to travel. Your **shortcut** enables your right foot to react and be **quick and lightning fast**.

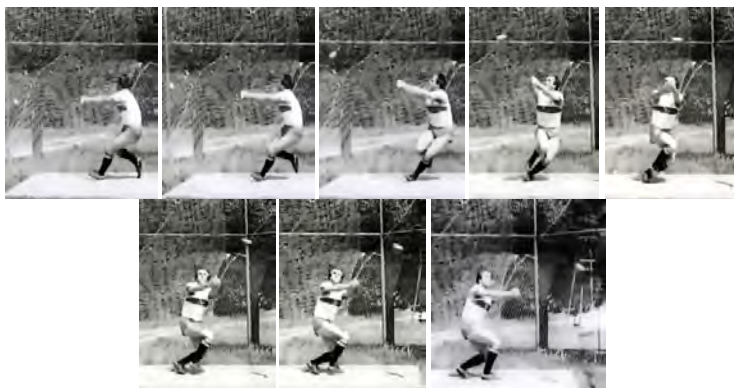


Figure 5.3: The Shortcut, rear view.

Looking at the **shortcut** from the rear view, Figure 5.3, you can see how you'll need to time your right leg and foot with the hammer, don't rush your right foot. You'll turn and tilt your left hip downward and back, **Tas Nazat**, and shoulders downward as your hammer ball rises to 180°. As the hammer **hangs** and then descends, you'll lower your right foot by **walking** to your double-support phase. By keeping your hips back and turning your body from below your shoulders, you'll create a tipping point where your head will "lead" and your right foot will react as a reflex to "catch" you from **mini-falling**. As you can see from this angle, your head will be over the circle where your right foot will finally land. You want to be **smooth**. If you rush your right foot down too soon, it'll drive you backward, like a slap in your face. If your head isn't leading, then you'll feel as though you'll need to reach out with your right foot to touch the circle. This will cause you to slow down.

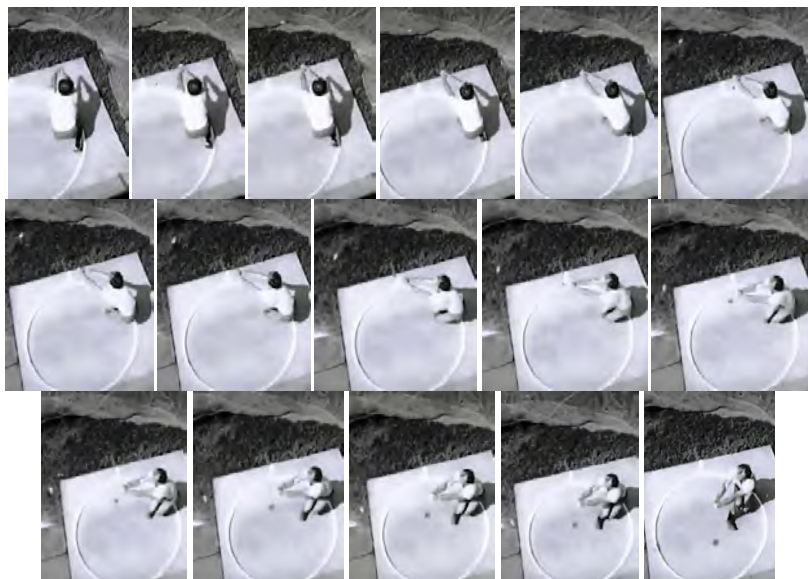


Figure 5.4: The Shortcut, overhead view.

Looking at the **Shortcut** from the overhead view, Figure 5.4, you can see how you'll need to be **patient** to feel your best **90° position**. Your hips are back, **Tas Nazat**, your arms are long, your shoulders are **relaxed** and your head centered forming your **water drop** with your hammer. By maximizing your radius and the effect of **gravity's force** on your body, you'll be able to continue your **swing** past 90°. This will help you **time** your **shortcut** to your first double-support phase. Once past 90° you can **tilt** your shoulders and hips to your left and downward (shoulders' line and hips' line should be parallel). This can be seen as your left butt cheek goes toward where your right foot was when you started your **Ukrainian Swing**. You'll feel your butt continue to go backward and outside of the back of the circle as you continue to follow your hammer as it climbs up to its high point at 180°. Your separation between your shoulders and the rest of your body will feel more noticeable at 140°. This is about when you start your **walk** across the circle toward 270°. You can just go "straight across", there is no need to turn your right foot or toes inward. This is a **walk**, as **straight** as you can do it. As

your hammer **falls** from its high point, this will enable you to **fall** with it, **catching** your hammer well behind you. You'll be able to bend your left knee as a hinge joint, no **twisting**, and **tilt** yourself to add more vertical separation with the hammer. You'll **catch** the hammer high and far back without straining your lower back by **twisting** your hips and spine.

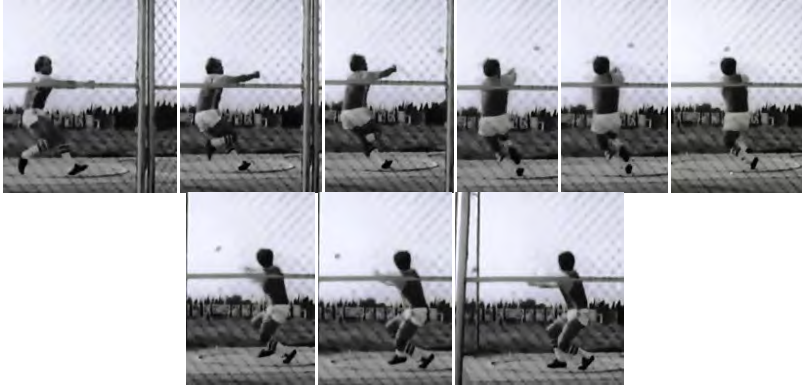


Figure 5.5: The Shortcut, front view.

Looking at the **Shortcut** from the front view, Figure 5.5, you can see how you'll move your left hip and left shoulder back and down and to the left after 90°. It's vital for you to **time** your right leg and foot to follow your head and your hammer as it **falls** from 180°. You'll be able to bend your left knee and **tilt** yourself which will place your head in the lead after about 140°. Your timing is important so you can let your right foot move straight across the circle to follow your head and "catch" your **fall**. You can see that a good **position at 90°** will help place your head over the area in the circle where your right foot was when you performed your **Ukrainian Swing**. By "leading" with your head, this creates the possibility of **falling** over after your "tipping point." As you've been urged to do throughout the throw, be **patient and smooth**. Let **gravity** help you **walk** along your **shortcut**.

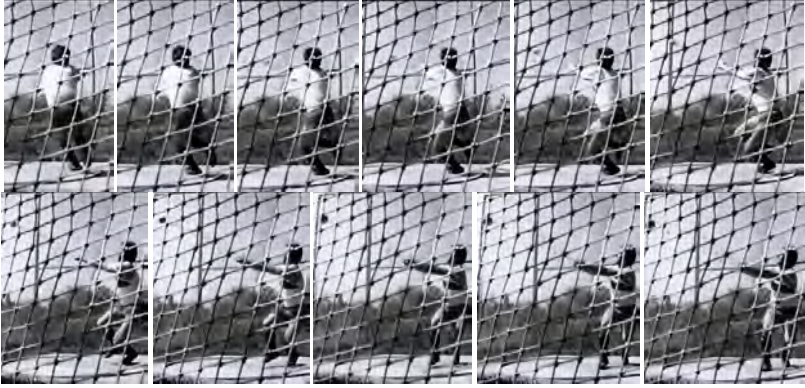


Figure 5.6: The Shortcut, side view.

You can see, in Figure 5.6, how your right leg and foot will remain back going to 140° . This helps you balance against the force of the outward pull of your hammer. **Timing** of your right leg and foot is evident from this view as you bend and lower your left knee. Your right foot will touch down with your hammer high and far behind you, preparing you for your first double-support phase. The height of your hammer will give it plenty of **potential energy** for your first **powerful pendulum phase**.

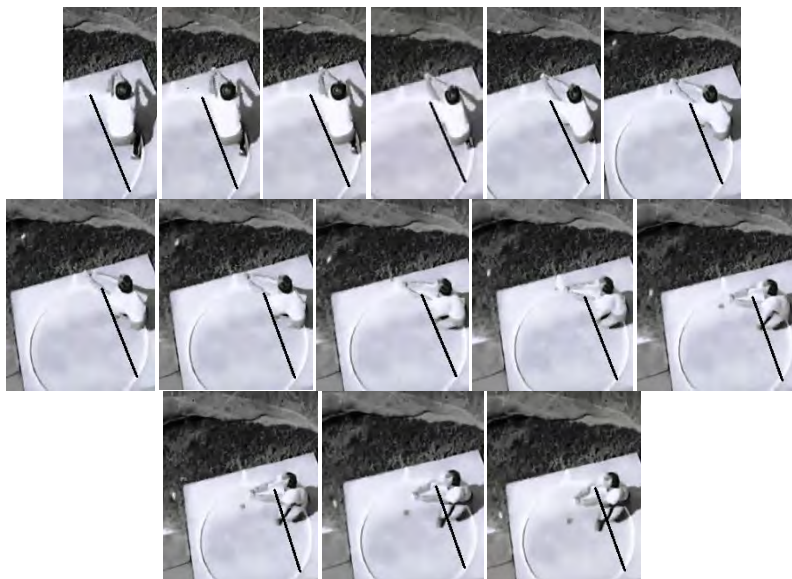


Figure 5.7: The Shortcut, Staying behind the line, overhead view.

Stay Behind the Line

Figure 5.7, shows you a straight line across the circle. You shouldn't move your hips over the line toward 180°. Instead, you'll need to back away, ***Tas Nazat***, from your **90° position** to continue your balancing act with the hammer. This will "clear a path" for your right foot to **walk a straight line** to your first double-support phase. Your left side should be relatively straight, don't push your hips toward your left to get ahead of the hammer. Don't let your left hip "bulge" to the side.

If you're a discus thrower, you may want to move your hips and drive your right leg. In the hammer, you'll have three rotations to move across the circle. Moving the length of your left foot across the circle is enough.

From my experience, working with novices, this is **very important** to do. As soon as you "hit" your 90°, you'll need to move your left hip backward, right away with no delay. You may need to go back to the **Ukrainian Pike Drill** to adjust and reset your stance. You'll need to feel your correct **neutral**

position that allows you to rotate freely from 0° to 180°. Your knees need to be behind your toes and your shins should be about perpendicular to the circle's surface.



Figure 5.8: The Shortcut, Staying within the Box, front view.



Figure 5.9: The Shortcut, Staying within the Box, rear view.

Turning the Corner

Looking at Figures 5.8 and 5.9, you'll see how you'll need to "turn the corner" by **tilting** your torso as a unit. Your left side needs to be straight. Your hips and just below your shoulders need to be parallel. This creates a "box" to stay within. Staying in your "box" provides you with enough time for you to do your transition from your single- to your double-support phase. You'll also be able to swing your hammer ball to its high point at 180°. Your **torso tilt** will enable you to **catch** the hammer higher and farther back. Look at how you'll be able to **"keep your eyes on the ball"** during the turn. An analogy is how you **tilt** on your bicycle when turning left on a banked curve to avoid falling off your bike.

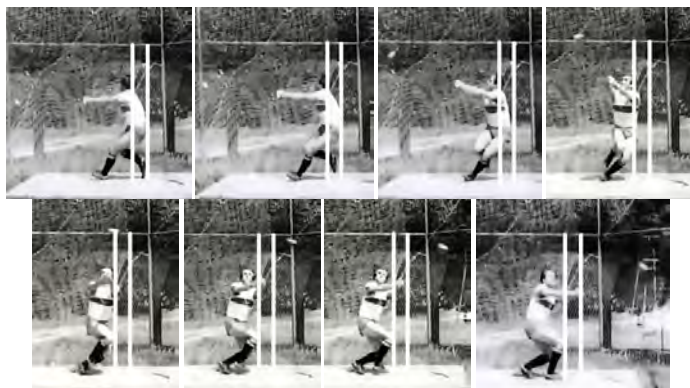


Figure 5.10: The Shortcut, Head Over Your Right Foot, rear view.

Head Over Your Right Foot

Figure 5.10, shows you how you'll need to turn your left hip down and back, **Tas Nazat**, toward where your right foot was, when you were at 90°. Tilting your torso down and around should occur between 90° and about 140°. And then your **torso tilt** will continue to rotate back around and away from your rising hammer. As you can see, your head position at your **90° position** will help you lead with your head during your **shortcut**. This will enable you to place your right foot down as a **walk** to your first double-support phase. Your left leg and knee action is **timed** with your rotation. Don't try to get out in front of your hammer by reaching for the circle with your right foot. When done well, you should feel stable when your right foot touches. The **walk** will also enable you to bend and drop your left knee without forcing it.



Figure 5.11: The Shortcut, Heel Strike, close view.

To Heel or Not to Heel Strike

When you **walk** "normally," your heel touches the ground first and then you roll to the front of your foot. As you increase your speed to jogging, running and then sprinting, the heel strike will disappear. As a beginner, your first **shortcut** should be timed and not rushed. The first rotation is "passive," driven around by your **powerful Ukrainian Swing**, and any forced action can cause an equal and opposite reaction. Once your right foot touches, do not grind it into the circle or force yourself to be on the ball of your foot. Do not "crush a bug" or "put out a cigarette butt." Any premature movement of your right foot will pull your hammer around with you and make it difficult to leave it high and far behind you. Be patient with your right foot while your hammer **swings downward** during its **pendulum phase**. Your left foot will turn "on its own" slightly as you swing along with the **pendulum downswing** and prepare for your next **neutral position** with the hammer. This will begin your first **upswing pendulum phase**. Be **smooth and patient** and don't view landing on your heel as a mistake, it's okay, just **relax**.

6. *The Power of the Pendulum*

The *Ukrainian Swing* is "*as easy as walking*" and "*as easy as falling*." When we learned to *walk*, it was trial and error and we did a lot of *falling* in the process. We didn't need to take an advanced class in physics, just encouragement from adults. Even though my intention is to make this *simple*, I'll take some time to explain the movement of a *pendulum*. The hammer is the only throwing event that has an implement with a handle and a heavy ball connected together with a wire. The "modern" throwing hammer is very much like a *pendulum*. You can use *gravity as a friend* to help you *swing* your hammer.

No Personal Exceptions for You in the Laws of Motion

Before I begin a brief "lesson" on the physics of a *pendulum*, it's important to understand the following. Although you may not need to study Sir Isaac Newton's laws of motion, there are no personal exceptions in the laws for you. Break the laws and your throwing will suffer. Do the best you can to follow them and your throwing will benefit. I personally think that the *Ukrainian Swing* makes the best use of *gravity*, way more than any other technique on earth.

Potential Energy Becomes Kinetic Energy

One concept to understand, and is easy to explain, is the transferring of *potential energy into kinetic energy*. When you lift a weight over your head, that's giving the weight *potential energy*. When you drop the weight, allowing it to be pulled to the ground by *gravity*, the acceleration of the *falling* weight is *kinetic energy*.

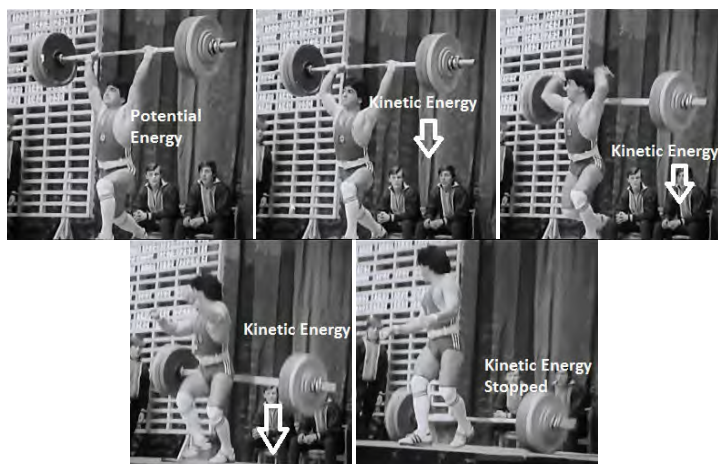


Figure 6.1: Example of Potential Energy Transferred to Kinetic Energy.

As you can see, in Figure 6.1, the weightlifter was able to get the bar and plates over his head, giving them **potential energy**. He was not able to hold onto the weight and let it **fall**, transferring his effort in lifting the weight to create **potential energy** into **kinetic energy**. He was unable to "win" his battle with **gravity** and got out of the way of the **falling** weight. As we say, never try to catch a **falling** elephant.

When you powerfully **Ukrainian Swing** your hammer with a good inclination of about 33-35° on your first turn, it's important to obtain a vertical displacement [a change in height between you and the hammer ball] at 180° in the circle. In other words, swing your hammer forcefully enough to send the hammer ball above your head. This increases your hammer's **potential energy**. When you let the hammer **fall** from its **high point** to its **low point**, the hammer ball's **potential energy** is being turned into **kinetic energy** or movement. Although the hammer can act like a **pendulum**, it's not a **simple pendulum**, because you initiated its orbit on an inclination. However, to make things **simple**, I will explain the basics as if your hammer and you were part of a **pendulum hanging** from the ceiling.

Forces in the Movement of a Pendulum

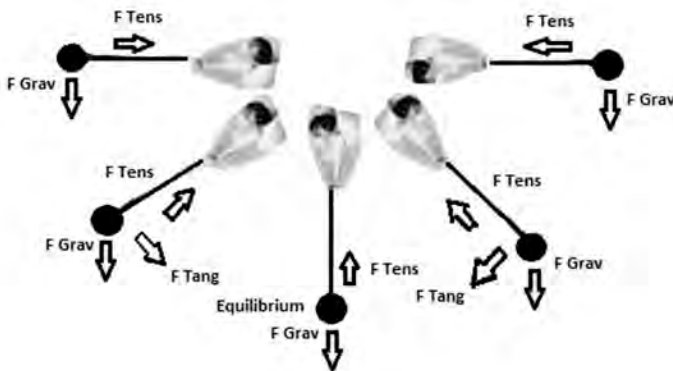


Figure 6.2: Forces involved in the Movement of a Pendulum

The forces shown in Figure 6.2 are the dominant forces working on a **pendulum**. The two major forces are **gravity** on the bob or hammer ball and **tension** on the wire. Wind resistance, another force, is ignored for this example. The force of **gravity** designated as **F Grav** and is always downward. The force of **tension** of the wire is designated as **F Tens**. The other "force," designated as **F Tang**, is tangential or at a right angle to the wire. **F Tens** is similar to **centripetal force** in rotational systems in that it acts upward and toward the **pivot point**. **F Tang** is similar to the inertial force of the ball going in a straight line. Tension on the wire is a result of both **centrifugal force** and its opposite, **centripetal force**. Centrifugal force, as was mentioned before, is an important force in analyzing the hammer throw, even though it's often described as a fictitious or pseudo force in physics. The pull of **gravity** moves the **pendulum** back and forth with the **tension** of the wire keeping the **pendulum** moving in an arc. In the case of your hammer, the hammer ball is moving in a circle as it orbits on an inclined plane. **Equilibrium** is when the **tension** and **gravitational forces** zero each other out. This is similar to your **neutral position at 0°**.

When observing a **pendulum swinging**, you can readily see, that **gravity** helps during the **downswing** and hinders the

upswing. This helps you understand why you don't have to exert a tremendous amount of force during the **downswing**, as your hammer **swings** downward from 180° to 0°. You will need to provide your hammer with a stable **pivot point** within your **water drop**. [Applying force to the **downswing** will come later, after you've mastered your timing with the **pendulum**.] And at 0°, you'll need to prepare for the **upswing** by positioning yourself in a **strong stable stance** with your knees bent. As you know, you can handle more weight in a quarter squat than a full squat. You don't have to have a deep knee bend. It just has to be strong enough to provide a **stable pivot point** as you **lean and fall back** with the **upswing** from 0° to 90°. Your **upswing** needs to be powerful enough to get your hammer "up and over" 180° for your next **pendulum phase**.

Three Progressive Powerful Pendulum Phases

You may ask, isn't your first "passive" turn to set up the rest of the throw wasted in a 3-turn technique? Shouldn't it be powerful, too? Don't I have only two turns left? When you look at the **Ukrainian Swing**, your entry into the turns starts with a **powerful swing**. You don't use a **pendulum**, your **swing** carries you into your first turn. Your first rotation is key in setting up your subsequent three **powerful pendulum phases**. Your **downswings** use **gravity** to transfer **potential energy** into **kinetic energy**. The last **upswing of your pendulum phase**, which includes the delivery, needs to be on **solid ground**. Your final stance was "set up" in your first turn at 90°. A **quick, powerful** release transfers your **rotational momentum** into **linear momentum**. The two factors of **speed** and **inclination** come together for your best distance. Remember the **Ukrainian Swing** can generate up to two-thirds of your final speed at entry. The remaining acceleration in speed comes **gradually** during each **pendulum swing**. The steepness of your hammer's orbit also changes **gradually** with each turn.

With the importance of the three progressive **powerful pendulum phases** in mind, let's take a look at how to handle your first **powerful pendulum phase**.

Gravity and the Pendulum Downswing

Your **pendulum's downswing** begins as your hammer descends from 180° and you're still taking your **shortcut, walking across the circle**. As your hammer **falls** from its high point, you'll be **falling**, a **mini-fall** as in **walking**. You'll be able to use your **falling** hammer to **time** your right foot touching down on the circle to stop your **mini-fall**. This will start your first double-support phase or what I call the **entry into the throw**. After placing your right foot down, [after you've completed your first **walk** across the circle, while dipping your left shoulder, bending your left knee downward and looking at the hammer], you'll let **gravity** help you as you time your **swing** with the **pendulum downswing** of the hammer while you provide it with a stable **pivot point**. Your hammer will accelerate at about 10 m/sec/sec with **gravity** alone toward your next **neutral position at 0°**. As the hammer **swings** downward, you'll rise up from the position you were in when you **caught** your hammer. Your action up will enable you to be in a strong and stable position at 0° in time with the force of the **falling** hammer. You'll need to **lean and fall backward** from above your **CoG**, [just as you felt in the progression with the DHW with your partner]. You'll need to have your knees bent in your **neutral position** so that you can use your legs as you **lean and fall backward swinging** your hammer to your next **90° position**.

You should work on your position you'll need to be in when "catching" the hammer in your first double-support phase. You should be in your **water drop**, looking back at the hammer ball. To obtain this position, you should only use bends in your body. No twisting of your hips. No torque on your lower back in order to lead the hammer. No forceful grinding of your right foot. **Patience** is the key to enable

gravity to aid you while you're **swinging** your hammer downward.

[To see the **water drop** and **pendulum swings** from over head, please, see Appendix A.]

Discobolus: What we can Learn from the Greeks

Often what is old is new again. In the case of your position when you catch the hammer, what is "ancient" is "modern" again. The Greeks threw heavy discuses in their time. Discobolus is an example of a thrower. The sculpture that is recognized as being correct is the one where he looks back at the discus, not the one with his head looking forward.



Figure 6.3: Discobolus

Imagine Discobolus with his hands together as if he were holding a hammer. You'll be able to see the similarities of his position with your double-support of the **Ukrainian Swing**. He gets his position by bending his knees and ankles and looking and reaching back as he bends at his waist. Another outstanding element is the dip of his left shoulder with his shoulders and hips both **tilted** down and back. He has little separation between his torso and hips. Perhaps, by trial and error, the Greeks discovered how they could save their lower back from injury. When they threw heavy discuses, they didn't twist or create torque by creating an "X" with their hips and torso.

Because you'll be using the gravity-aided **pendulum downswing** with your own well-timed and seamlessly added

swing, you won't be creating much of an action-reaction situation. You'll be **patient** with your right foot. Do not grind your shoe into the circle on the ball of your right foot. Don't "crush the bug" or "put out a cigarette butt." Premature movements of your right foot and leg will cause you to drag your hammer and interrupt the **pendulum** effect. Let your left foot move with the hammer as it **swings** down toward your **neutral position at 0°**. Footwork is important in the hammer throw, but it's not forced nor initiated by you. Your feet need to work with the hammer's **swing**, more as a reaction or reflex to accommodate your hammer's **pendulum swing**. After you get the "swing of it," you'll not even realize what your feet are doing as you focus on your hammer swinging.

Twisting your hips, to lead the hammer and drag it, is not what you want. "Pushing" the hammer with tight shoulders should be avoided. You want to move **smoothly** with the hammer, letting it **fall and swing**. Be **patient**. Just follow the **swing** with your hands [don't interfere with the orbit and inclination of your hammer] and keep your shoulders relaxed, your arms long, your head centered and stay in your **water drop**.

Timing of Your Right and Left Legs and Feet

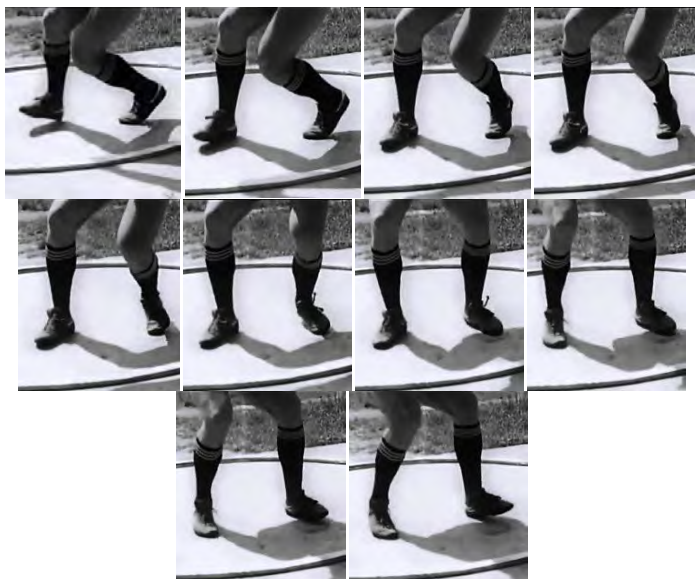


Figure 6.4: Timing of the Right and Left Legs and Feet in First Double-Support Phase

As you can see, in Figure: 6.4, after your right foot lands down ***smoothly***, you need only to let your hammer ***swing downward*** until you feel you can add to it with your own ***swing***. Your additional ***swing*** should be ***smooth*** and not jerky. Your left foot turns as you follow the hammer on its ***pendulum downswing***. Your leg and foot movements are like when you ***walk***, your left foot, then your right foot. Using your bilateral coordination will help you perform your ***pendulum swing*** more efficiently. Your right arm will ***swing*** with your left leg and foot. Your right foot stays calm to provide your hammer with a stable ***pivot point***. This will increase the ***tension*** on your arms and your hammer wire. Your hammer ball will be helped along by the ***force of gravity and the force of tension on the wire***.

The hammer will be finished accelerating downward when the ***forces of tension and gravity are in equilibrium***. This point should be when you're at your ***neutral position***, your strong and stable two-legged position. If you leave your hammer alone, it will continue to act like a ***pendulum*** and ***swing upward*** to your left. However, as is shown in Figure 6.2,

gravity will start working against the hammer ball's velocity by pulling it down. It's during this part of the **pendulum swing** that you'll need to give your hammer a "boost." This will be your use of **gravity on your body**, which I'll go into detail later.

First, you'll work on your 3 double-support positions when you "catch" the hammer behind you. Each one will be a **gradual** change. You'll be quicker and tilted more as you "catch" your hammer farther behind you on each turn.

1-2-3 Broom Drill

For you to get a feel for these 3 positions, you'll do the **1-2-3 Broom Drill** while holding a broom in your hands.



Figure 6.5: 1-2-3 Broom Drill with each position, overhead view.



Figure 6.6: 1-2-3 Broom Drill with each position, rear view.



Figure 6.7: 1-2-3 Broom Drill with each position, front view.



Figure 6.8: 1-2-3 Broom Drill with each position, front-overhead view.



Figure 6.9: 1-2-3 Broom Drill with each position, side view.

Figures 6.5 - 6.9 are different views of the 3 positions of the **1-2-3 Broom Drill**. What is necessary for you to feel is your ability to reach back farther and higher in each progressive position without turning your hips or twisting your lower spine. You should face your broom with your eyes on the end of the broom and turn only your shoulders, **tilt** your torso down to the left and your left hip backward, **Tas Nazat**. You'll feel your left knee bend slightly more at each progressive position with your increasing **torso tilt**. You will not have to force your knee down, it will happen naturally as you reach farther back each time. In a drag style technique, it is more difficult to get ahead of your hammer on each successive turn because of the load on your hips that pulls your hammer along with you. By rotating everything below your shoulders, you'll relieve this load which allows you to gain on the hammer with almost your entire body. You won't be twisting to form a cross with your hips and upper body. This will also relieve torque on your spine and enables you to let the **pendulum swing** opposite your **CoG**."

Repeat the **1-2-3 Broom Drill** to help you stretch your muscles and learn to be **patient**. The **Ukrainian Swing** technique relies on **timing** and **patience** with the **pendulum**

swing. As said before, there is no need for you to actively twist your hips or turn your right foot once you've hit your double-support phase. Be **smooth and rhythmic**, don't yank or jerk the hammer. Let **gravity** assist you with your **downswing**.

Sledge Hammer Pendulum Drill

Another drill, the **Sledge Hammer Pendulum Drill**, will help you feel the **pendulum swing**. Grasp a sledge hammer handle with both hands. **Swing** it up and back to your right and then let it **fall**, while still holding onto the handle. Don't force the swing with your shoulders or hands, just let it **swing** freely. You can increase the amplitude [height of the **swing** to your right] and let it **fall** to see how high it will rise on its own toward your left side. Remember, keep your shoulders and arms **loose and relaxed**. Be in a **water drop** position and keep your eyes on the head of the sledge hammer. Let it **swing** back and forth with **gravity** doing the work for you.



Figure 6.10: Sledge Hammer Swing Drill, rear view.

In Figure 6.10, you can see how you'll need to just let the sledge hammer **swing** from your right side to your left. As it **falls** down toward the **pendulum's equilibrium point**, [your **neutral position**], the hammer will be accelerating at about 10 m/sec/sec. After it swings past the point where the **force of**

gravity and the **force of tension**, [on your arms and the hammer handle], are "equal", the sledge hammer will start to decelerate as it reaches its highest amplitude (height) off your left side. Let the sledge hammer **swing** freely, don't try to help it during its upswing to your left. First your left leg and foot will move and then your right leg and foot [see Figure 6.4: Timing of the Right and Left Legs and Feet in First Double-Support Phase]. Don't force these movements, **time** them with your **swing**. Just hold onto it with your hands. Keep your arms and shoulders **relaxed** and move your **CoG** with the sledge hammer. Be **patient and smooth and rhythmic**. Don't get ahead of, nor lag behind the sledge hammer as it **swings**.

7. The Power of the Pendulum, The Upswing

The Pendulum Swing:

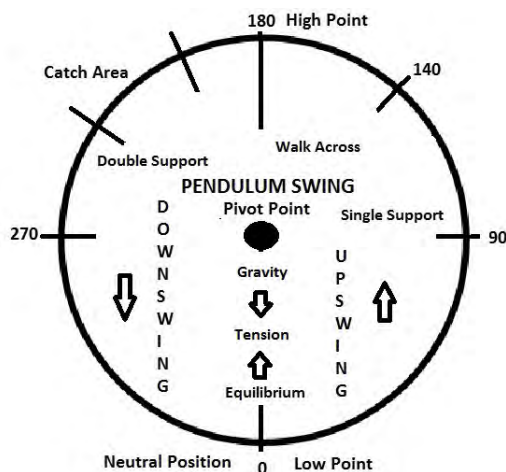


Figure 7.1: Approximate Phases of the Ukrainian Swing.

When you learned about and tried the **powerful pendulum downswing phase** of your throw, you felt the **force of gravity** on your hammer. You learned to have **relaxed** arms and shoulders in your **water drop** as you looked at the hammer. You learned how to catch the hammer higher and farther back without twisting your hips. You felt how the hammer **fell** from its **high point** at 180° to your **neutral position at 0°**, which is the **low point** of your hammer's inclined orbit. It's also the **equilibrium point** of the **pendulum** where the **force of tension**, [on the wire and your arms]. and the **force of gravity** zero each other out. When you let the sledge hammer **swing**, you also felt how the **force of gravity** pulls on the hammer and slows it down during the **upswing** of the **pendulum**.

Gravity and the Pendulum Upswing

After understanding how **gravity** works to slow your hammer down during its **upswing**, it's time to work on how you'll give your hammer a **boost of energy**. This is your phase during which you'll learn to use both the **force of gravity** on your body, [by **falling** and **leaning backward**], and your muscular **power** of your legs, back and your all important glutei maximi or your big muscles making up your buttocks.

First you'll have your **upswing** tested to get a feeling how you'll need to position yourself as you move from your second **neutral position** to your second **position at 90°**. Remember that with your first **neutral position** and **position at 90°**, you were working with your **Ukrainian Swing** to give you the momentum into your first turn. This turn is used to set up your subsequent turns of the throw. There is no **pendulum driven upswing** in the first turn. Your first **upswing pendulum phase** comes only during your first double-support phase of your **entry into the throw**. This will be after your first **pendulum downswing**. You'll be able to start your **upswing phase** as the hammer passes the **equilibrium point** of your **swinging** hammer. You'll need to time your **leaning and falling back** with the **downswing** and **upswing** of your hammer. You'll want to be **patient** so that you don't "drive" your hammer downward too hard and disrupt its circular orbit. After its **equilibrium point**, you'll **swing** with your hammer upward, traveling along its inclined orbit to your **90° position** and then feel it continue upward to its high point at 180°.

Let's test your **upswing phase** with a DHW and a partner. Instead of getting into your first **neutral position**, start in your second one.

So that you won't have to flip back through the pages of this guidebook, the following are copies of the progression of your **neutral positions** minus your first one, just the last three. The third **upswing phase** will be used by you for your delivery and release of the hammer.



Figure 7.2: Progression of the Neutral Position at 0° last three, rear view.



Figure 7.3: Progression of the Neutral Position at 0° last three, overhead front view.



Figure 7.4: Progression of the Neutral Position at 0° last three, overhead front view.



Figure 7.5: Progression of the leaning back at the 90° position, last three, side view.



Figure 7.6: Progression of the leaning back at the 90°, last three, overhead view.

Earlier in your training, you and a partner tested the strength of your **neutral positions** and **balancing positions at 90°**. These tests were standing in place. You only **leaned back** and determined a strong and stable position. This time your partner will move with you from each **neutral position** to **90° position**. Each time, you'll begin at your progressively changing positions and move with your partner. You should be able to feel how to apply the **maximum force** against your partner's pull on the DHW.

Please, note how your second **neutral position** is much different from your first, which was entered into with your **Ukrainian Swing**. A long radius, drawing a big circle with your hands and keeping your **CoG** back, [as far away from the hammer as possible], are of prime importance in the first turn. Once you **enter into your throw**, it'll be more difficult to correct any instabilities in your body positions and your hammer's orbit and inclination. If you begin poorly, it'll never improve in the subsequent turns. Therefore, it's very important to do your first turn as well as you can.

To do a little testing, start in **neutral position 2** with your knees bent and find a stable position. Once you are stable, try to move your partner by leading with your hips. What happened?

Try moving your partner by turning and forcing your hips forward as you **lean back**. Was that forceful?

Next, try moving your partner by turning and **leaning and falling backward** from above your **CoG**. As is shown in Figure 7.5, it's crucial that you **lean back** and not move your hips forward. By **leaning backward**, as though you would **fall**, takes advantage of the **force of gravity** on your body. You have placed yourself at a tipping point with the hammer, ready to **fall**. Combining your muscular strength with the **force of gravity** optimizes your ability to place **tension** on your arms and the hammer's wire. In **pendulum** terminology, this is the **force of tension** on the wire hanging on a pivot point. In general physics, this is **centripetal force** toward the center. Anyway you say it, you'll need to be able to increase your

force of tension on your arms and the hammer's wire as your hammer accelerates, traveling around its inclined orbit.

Your Body as a Lever, Your Heel as a Fulcrum

When you learned how to maximize the length of your relaxed arms, find a balance with your body weight and the hammer ball, and be in a water drop **position at 90°**, you were on the heel of your foot. This established your **fulcrum**., the point on which a **lever** turns. And the **lever** is your body, as you progressively **lean and fall backward**. With the **pivot point** of your swinging hammer at your shoulder level, this allows for leverage to increase the **tension** on your arms and the hammer wire.

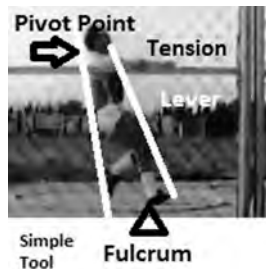
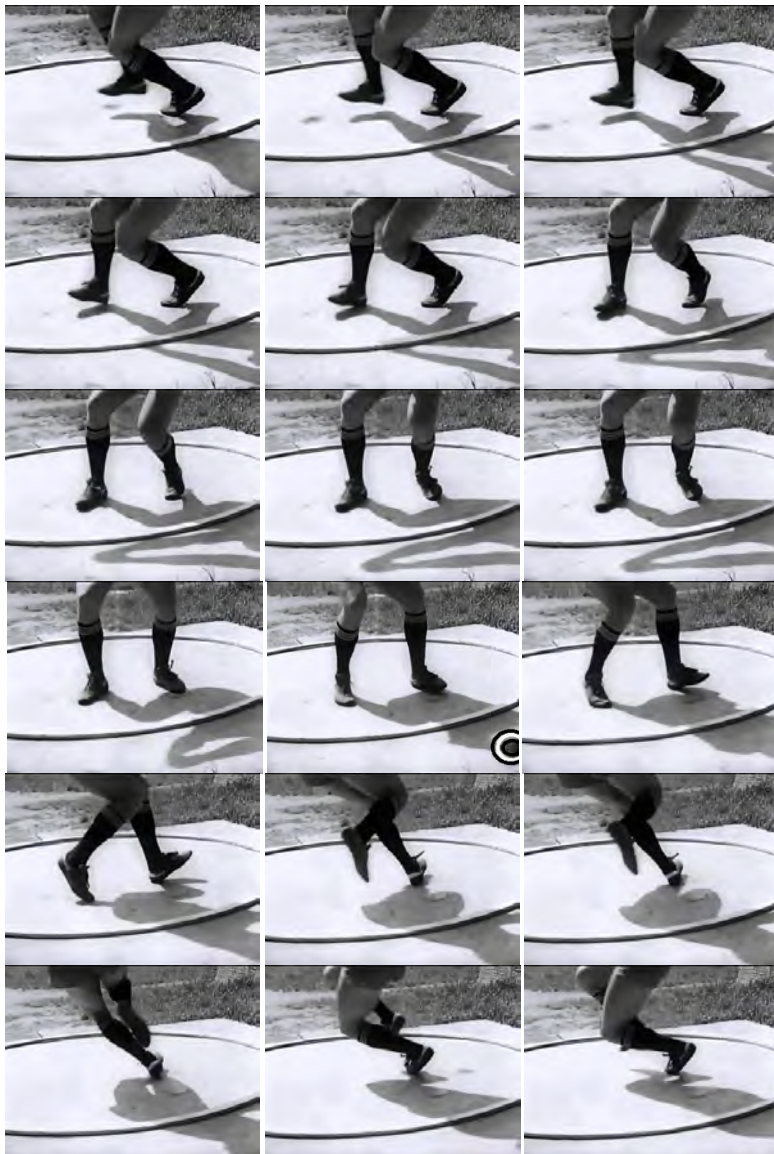


Figure 7.7: Your Body as a Lever, Heel as a Fulcrum

Timing Your "Footwork" with Your Swings

Timing your "footwork" with the **swings** of your hammer is of prime importance for the **Ukrainian Swing**. Your swinging hammer determines your "footwork" not the other way around. After you get the hang of it, you'll soon forget about your feet and focus only on the ball. You must have **patience to wait** for the hammer to reach its **low point** with a good base. The following pictures are close-ups for you to study Yuri's "footwork." I captured the hammer each time it was centered. Take note of Yuri's strong stance, with his knees bent, in each of the three **pendulum downswing**

transitioning to pendulum upswing phases. Stability is a requirement for you to perform each one of your **upswing phases**. The pictures start during the **Shortcut, walking a straight line**, while **entering the throw** in the first double-support phase. This is after the **Ukrainian Swing** had already carried you around in your first turn.



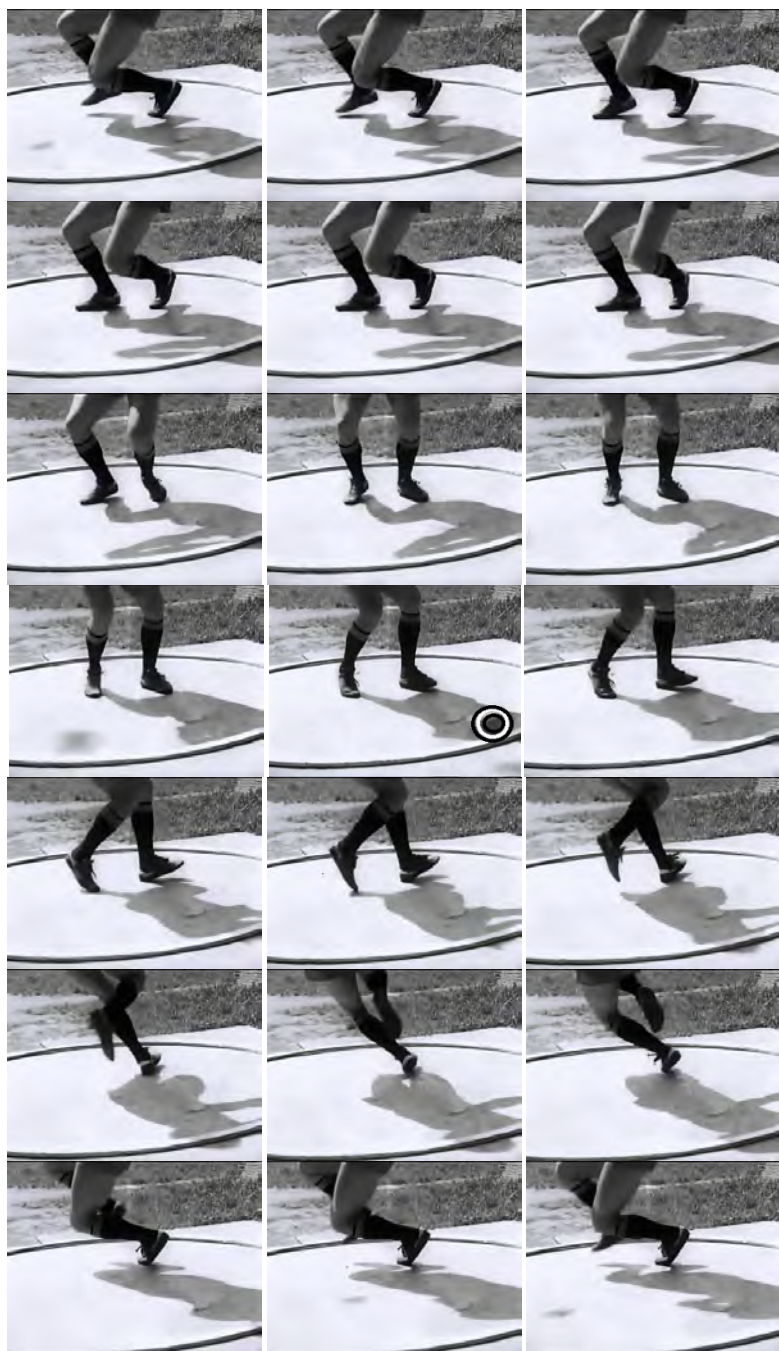




Figure 7.8: Close up of the footwork for last three Pendulum and Power, front view.

You can see, in Figure 7.8, the relationship between your "**footwork**" and the hammer **swinging**. You can see the hammer ball being centered with a very stable stance in all three turns. Your knees will be bent just enough for you to handle the **force** of the hammer at its low point. Bent knees are necessary to enable you to apply **force** to the hammer while you **lean and fall backward** into the turn.

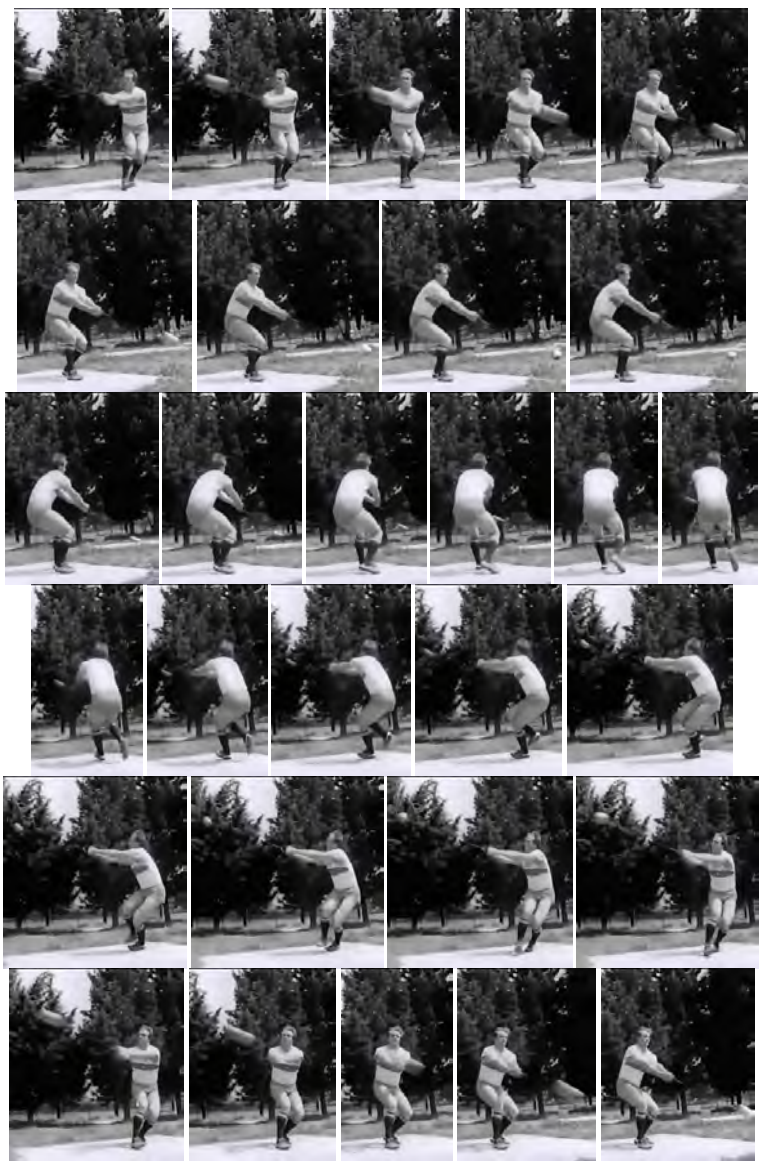
Never practice your **footwork** without a hammer or a hammer substitute in your hands. The hammer's swings determine your "footwork." Taking your **shortcut** across the circle is a matter of timing. Your right foot is slow in coming off the circle going past 90° and then quick when coming down in your double-support phase. Remember, don't stomp your right foot down or reach out to touch early - **walk** don't strut. You must be **patient** to coordinate your **pendulum downswing** with the movements of your legs and feet. You must also time your **upswing boost**.

A broom can be used for timing your "footwork" with the hammer's orbit and inclination. Start with your first double-support phase stance. Remember the **1-2-3 Broom**

Drill and your position for number 1. Now you can do the **Broom Timing Drill**. With the broom handle in your hands, let the broom swing **smoothly** from your first "catch" position to your second **neutral position**. Remember the **pendulum** and how **gravity** will help you when you add your **swing** with the **pendulum downswing**. You should be **smooth, timed** and not jerky. Be **patient** until the broom is in front of you. Let your left leg and left foot move with the broom first. Then, as the broom is in front of you, after your stance narrows, feel a good base and then **lean and fall backward** slightly as you turn with your broom to 90°. [Remember to **lean back** without pushing your hips forward.] You should be on your left heel. As you lift the broom upward toward its high point [giving your broom **potential energy**], **turn the corner** and **take the shortcut** to your next **downswing and upswing pendulum phases**. You should feel that you can reach back a little more with your broom and have it a little higher than the previous double-support phase "catch." Repeat your **timing** of letting your broom **swing downward** as you add your **swing** going to your **neutral position** with your knees bent. Repeat your **upswing phase**, lifting your broom a little higher. Repeat **turning the corner** and **taking the shortcut** to your next double-support phase.

Perform 3 to 5 turns with the broom. Make sure you're **smooth and rhythmic** and your **swings** are well timed. You'll see how the actual hammer in Yuri's drill accelerates downward as it **swings** like a **pendulum** with a seamless swing by Yuri. The hammer ball becomes blurred as it approaches the **neutral position** in each turn. Your broom is lighter than a hammer, but you should still feel the acceleration as you let the broom **swing downward**. Its movement is helped along by your body moving [left leg and foot first with your **CoG** opposite the broom] with the broom. You're providing your arms and broom with a stable pivot point with **relaxed** arms and shoulders while looking at the end of the broom [in your **water drop**]. Remember as the broom rises, it's gaining **potential energy** and then, after it reaches its peak at 180°,

this energy is transferred to *kinetic energy* [movement] as it *falls* under the influence of the *force of gravity*. On earth, with its *gravitational pull*, "what goes up must come down."



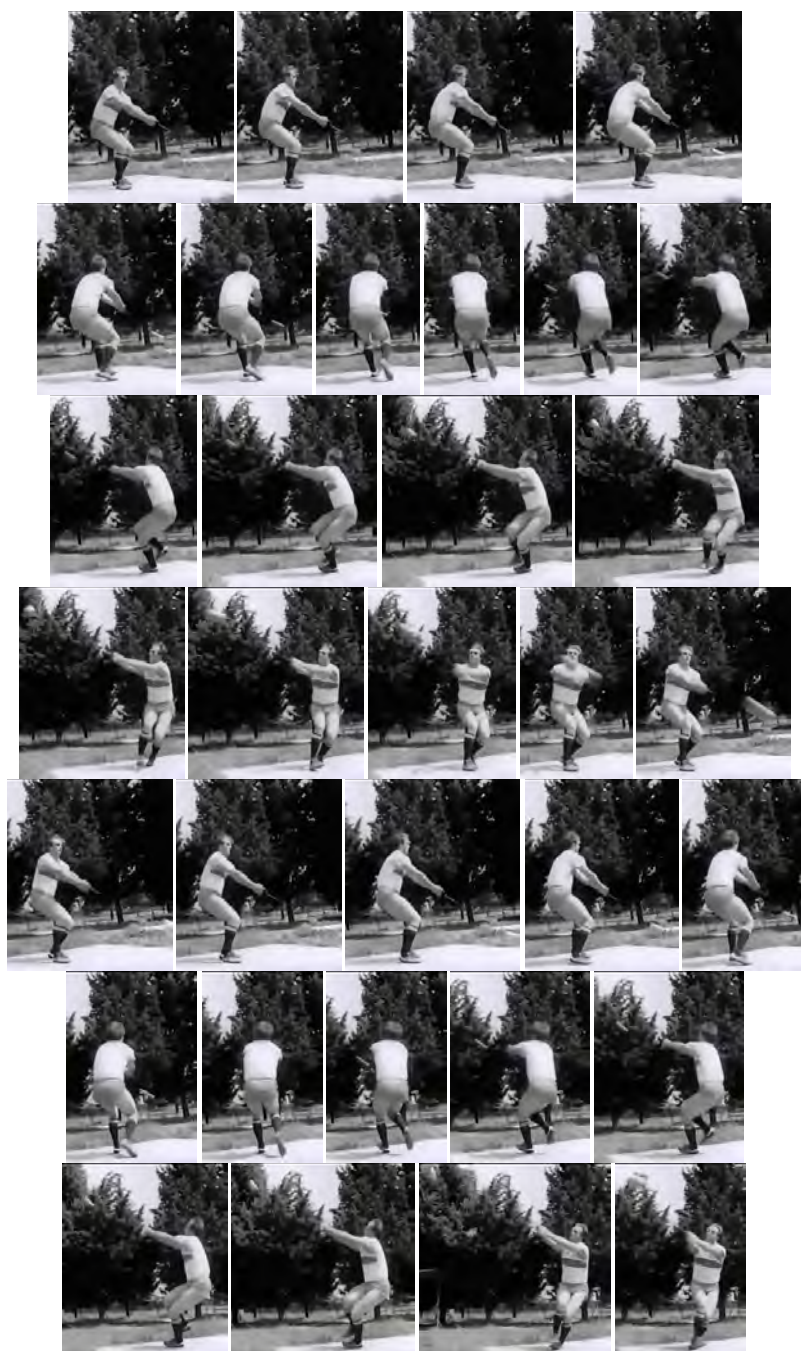






Figure 7.9: An Example of Yuri doing Multiple Turns, side view.

You can see, in Figure 7.9, Yuri doing multiple turns with a hammer. This is similar to your **Broom Timing Drill** during which you'll need to **time** your **pendulum downswing** with your swinging as you center the broom and continue your **pendulum upswing** while you turn to 90° and up to 180° . You can see how you'll need to time your **walk across the circle** with your broom ascending from 140° to 180° . Then let your right foot touch as your broom descends during the **downswing** to 270° and farther down to 0° . You should be able to "catch" your broom high and far behind you.

As Yuri does multiple turns, you can see how his hammer gets higher and faster. In the last couple of pictures, Yuri looks like he's holding on to a flying kite, his hammer has risen so high. These last couple of turns are of course too high for an actual throw, but they do show you how the inclination of the hammer's orbit increases gradually with each **powerful pendulum phase**. Remember, vertical displacement creates **potential energy** that can be transferred into **kinetic energy** for the **powerful pendulum swing**.

How much should you **swing** with the **downswing** of the hammer? My advice to you is to first feel the speed of your hammer **falling** with just **gravity** alone. Guide your hammer **downward** with your hands. Never jerk the hammer. Be **smooth**. As you get a feel for the **downswing** to your **neutral position**, you can add a little more forceful **swinging**

and see if you can handle it. Add your effort **gradually**. The important thing is not to disturb the orbit and inclination of your hammer.

What Might Disturb the Orbit of Your Hammer

If you don't keep your arms straight and **relaxed** in your **water drop** and don't move your hands with the hammer, you can change the hammer's circular orbit into an oval, or displace its high and low points.

To feel what might happen, try the following:

1. Hold a hammer in your hands and **swing** it back and forth **smoothly**, increasing the amplitude of the hammer ball a little each time. Now try to force the hammer to move by jerking your hands back and forth. What happened?
2. Start swinging the hammer **smoothly** again and have a partner try to increase the hammer's amplitude by moving the wire. What happened?
3. Start swinging the hammer with your shoulders, keep them tight in a rigid triangle. Try to increase the amplitude. What happened? Was it less than when you had loose shoulders?

Your **swing** efforts, added to the **pendulum downswings**, should be **timed, smooth and seamless** so that the hammer wire, your hands and your arms stay as straight as possible and in line with each other. Loose shoulders will also let the pendulum swing freely.

Repeat the **Broom Timing Drill** on a regular basis. Be **smooth** and **time** your "**footwork**" with your broom.

8. *The Delivery and Release*

To practice your delivery and release, you'll want to learn how to stop turning. By stopping your rotation, you'll be transferring your **rotational momentum** into your hammer's **linear momentum**. You'll want the hammer to be as fast as possible with the best inclination at your release in order to obtain the farthest distance for your efforts.

Delivering the Sledge Hammer Drill

Instead of a broom, a sledge hammer will be better to give you some weight to your implement. Get into your best third-turn position in your double-support phase. Just as you did in your **Broom Timing Drill**, be **patient** and **wait** until your sledge hammer **swings** down with gravity with a little help from your own swinging and is centered. Keep your left side straight. No bulging to the side with your hips. No leading with your hips. Stay on balance, don't force your weight onto your left foot and leg. With knees bent at your **neutral position** and the hammer swinging, you'll **lean and fall backward** as far as you can while straightening your left leg. This should stop your rotation and prevent you from going into another turn. Remember, be **smooth and rhythmic**. Don't try to rush the delivery or "kill it." **Waiting** for a good stable and strong base is fundamental for a great delivery. Feel your hammer accelerating **smoothly**, not jerkily. "Put on the brakes" as you move your head backward. Release your sledge hammer at your **90° position**. The hammer should fly at a right angle to your release.

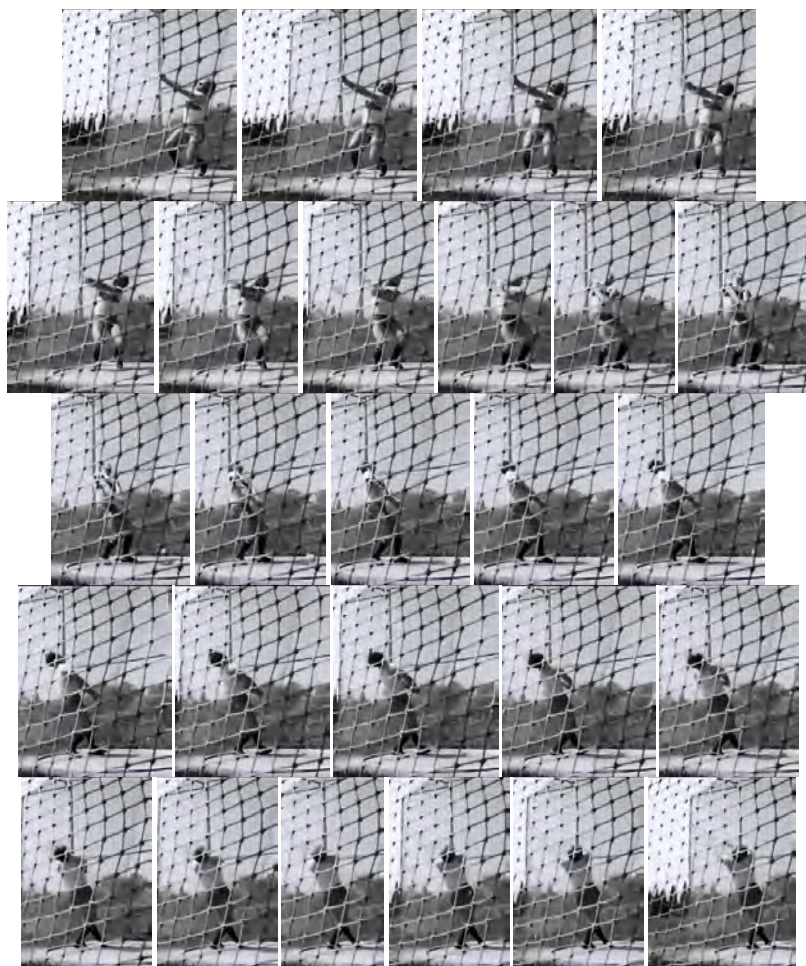


Figure 8.1: An Example of Yuri doing his Delivery and Release, side view.





Figure 8.2: An Example of Yuri doing his Delivery and Release, rear view.

You can readily see how high your hammer should be at 180° for your final **powerful pendulum phase** going into your delivery and release. You can see how you'll take the hammer's **potential energy** and let it be transferred into **kinetic energy**. It'll **swing downward** by the pull of **gravity**, and with some help from you, and then whiz past your stable **neutral position**. With your knees bent, it'll **swing upward** as you **lean and fall backward**. Because this is your last phase, you'll need to **lean and fall backward** to your maximum and extend your left leg as you "put on the brakes." Your body will act like a **lever** and your left heel as a **fulcrum**. This will turn your **rotational momentum** into **linear momentum** as your hammer soars into the air, like a cannon ball out of a cannon.

After seeing how high and steep your hammer's orbit and inclination should be, you can honestly say that you don't think your hammer's orbit should be flat. Nor would you say the hammer never goes above your shoulders. A nice high and steep orbit is necessary for you to give your hammer ball **potential energy**. This way, it can be transferred into **kinetic**

energy which is a key element of your ***Powerful Pendulum Phase***. May the ***Power*** be with you!

9. *Summing Up*

In the previous chapters of this guidebook, you've been given an introduction to the **Ukrainian Swing Technique**. As you practice your winds, forceful **Ukrainian Swing, powerful pendulum phases** and turns, you can move from rope hammers, brooms, mop sticks and sledge hammers to light throwing hammers.

*Appendix B has a sequence of one of Yuri's throws that was published in the January, 1977 issue of **Legkaya Atletika** magazine. The winds are missing, which was common at the time. The preliminary winds, as you have learned, are key elements for performing the Ukrainian Swing.*

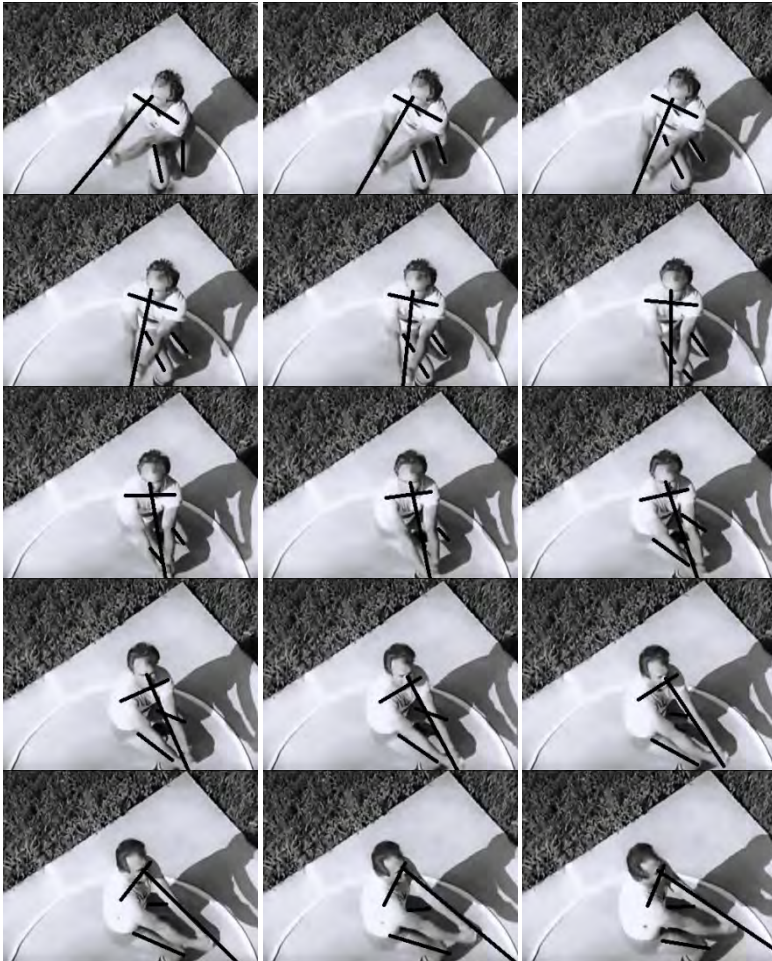
Your two simple and effective winds are the start of and build the basis for the rest of your throw. Never skip working on your winds and Ukrainian Swing into the entry of your turns. Each element is "stacked" upon the previous one. If you rush or skimp on the foundation of your throw, it will become more unstable with each successive turn. Be **smooth** and **time** each element. **Timing** with your hammer is critical to utilize your stable **neutral positions** and your **well-balanced 90° positions**. Your powerful **delivery** and **release** are a result of your performance of the previous elements.

Swinging with Finesse

The **Ukrainian Swing** technique combines the **downswing and upswing of a pendulum** with your ability to **swing** with loose arms and use your body as a **lever** and your heel as a **fulcrum**. In your **water drop** position, your arms and the hammer's wire create a very long "string" to the ball of the hammer. Your swinging with the **pendulum** should be

well timed and seamless so that your throw looks **smooth** and **quick**, almost effortlessly.

Having thrown with the **Ukrainian Swing** myself, it's often difficult to put into words the feeling of the **downswing** of the double-support phase. **Smooth** comes to mind immediately, but a series of pictures should help.



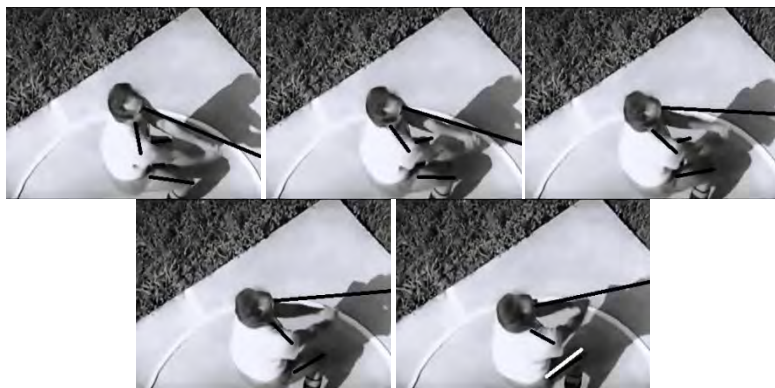


Figure 9.1: *Swinging with Finesse*

You can step through the sequence in Figure 9.1 to see how Yuri catches the hammer far and high behind himself in his double-support phase. His first movement is to **swing** with the hammer aided by **gravity**. He starts neither with his feet, nor his hips. Moving the ball is most important. You can observe how he **swings** the hammer toward his calm right leg as his left leg moves first. And as he continues his **swinging**, he finally squares up his shoulders, torso, hips and feet at his strong and stable **neutral position at 0°**. Because he catches the hammer so high and far behind himself, he has "plenty of time" to **swing the hammer smoothly** without jerking or yanking it.

After performing your **smooth, quick swings**, never try to "muscle" your delivery. **Keep it smooth**. If you're "off" at the beginning, your technique won't improve by going faster or forcing positions. Don't try to do your entire throw in your first turn. Take your **time** and be **patient**. Remember your first turn is "passive" initiated with a **powerful Ukrainian Swing**. You should do this **smoothly** and **effectively**. You'll use your first turn to set up the rest of your throw. Make a nice wide circle with your hands. Keep your **CoG** as far away from the hammer, **Tas Nazat**, as well as you can.

How well you use your **powerful pendulum phases** will depend on the height of your hammer ball and how far behind it is when you **catch** it entering your first double-support

phase. To get into your best "Discobolus" position, you'll use your **shortcut** across the circle when you **walk a straight line**. Your right foot will be a **reflex** to your **mini-fall**.

Catching your hammer high [**potential energy**] and far behind you, will use **gravity** during the **downswing** [**kinetic energy**]. When you **lean and fall backward** using your body as a **lever** and your heel as a **fulcrum**, you'll be helping your **upswing** by providing it with a stable **pivot point** and **tension** on the hammer wire and your arms.

If you feel you're having a problem sitting back "enough", then go back and do the **Ukrainian Pike Drill** to reset your stance. Remember your stance will be used to **swing** the hammer and not "counter" it into the first entry. Sitting back is to place your **CoG** back far enough so you can complete your **swings** and **delivery and release** with stability.

If you feel you're not **catching** your hammer high enough and not far back enough, then revisit your **shortcut**. You can do the **One-Legged Tilt and Walk Drill** to feel your "tipping point" and **time** your **walk** to **catch** your **mini-fall** as you **tilt** your torso and **walk a straight line**. You can also do the **1-2-3 Broom Drill** to work on your "Discobolus" position and stretch back, using bends in your joints and waist and a **tilt** of your shoulders.

Your Elements to Work on

1. Two simple and effective preliminary winds, each different in small ways.
2. **Ukrainian Swing**, smooth, timed and powerful.
3. "Passive" first turn, powered by your **Ukrainian Swing** and used to set up your throw.
4. **Shortcut** across the circle, walking a straight line.

5. "***Discobolus***" position, using bends in your joints and your waist with a tilt of your torso to reach back high and far.
6. First Powerful Pendulum Phase.
 - a. Double-support phase.
 - b. Downswing, helped by gravity, potential energy to kinetic energy.
 - c. Swing timed with the downswing to be seamless and smooth.
 - d. Upswing, helped by your leaning and falling backward, (lever and fulcrum).
 - e. Single-support phase, taking your short cut.
7. Second Powerful Pendulum Phase.
 - a. Double-support phase.
 - b. Downswing, helped by gravity, potential energy to kinetic energy.
 - c. Swing timed with the downswing to be seamless and smooth.
 - d. Upswing, helped by your leaning and falling backward, (lever and fulcrum).
 - e. Single-support phase, taking your short cut.
8. Third Powerful Pendulum Phase.
 - a. Double-support phase.
 - b. Downswing, helped by gravity, potential energy to kinetic energy.
 - c. Swing timed with the downswing to be seamless and smooth.
 - d. Upswing, helped by your leaning and falling backward, (lever and fulcrum).
 - e. Powerful delivery and release, inclination and speed - ***rotational to linear momentum***.

I recommend that you work a lot on your winds and entry with a light hammer in the beginning. Focus on **timing** and **smoothness**. Be **patient** and don't jerk or yank the hammer.

I also recommend trying your **Broom Timing Drill** with a light hammer. Remember always work on your "footwork" with a hammer or a hammer substitute. Never ever work on "footwork" without something in your hands that you can **swing**. Swinging determines your "footwork." After time and practice, you'll even forget about your "footwork" and focus on swinging your hammer.

If you need more time to practice your winds and three turns in order to establish your stable base for a good delivery, then you can practice your delivery and release with a sledge hammer. But never ever consider this as a replacement for getting to your delivery and release by starting with your two winds, **Ukrainian Swing** and turns.

When You Receive "Coaching"

Some thoughts about when you might be "coached" from well-meaning friends or fellow throwers.

First of all, always be polite. They're just trying to help you. You can say, thanks, man. It's really nice that you want me to throw farther.

But, when you hear:

"squeeze the handle," think, I'm gripping it, like holding onto a cliff for dear life,

"push," think, **Ukrainian Swing and Pendulum Swings**,

"stance is too wide," think, it's just right, I determined it with the **Ukrainian Pike Drill**,

"flat," think, I'll swing the hammer **steeper and higher**,

"turn and wind to your right," think, I do winds so I can center the hammer,

"move your hips in a circle when you wind," think, I could never do the Hula,

"turn on the ball of your left foot," think I'd rather roll on the side of my left foot,

"make a rigid triangle with your shoulders and arms," think, I'm a ***water drop***,

"drive your right foot around," think, I'm ***walking the line***,

"drive your left knee down," think, I'll leave the hammer farther and higher behind me,

"you're dipping your left shoulder," think, dip it down to go around,

"your hammer is too high above you shoulders," think, I love more ***potential energy***,

"you're leaning too much," think, I'll ***lean and fall backward*** as much as I want to,

"slow down your entry," think, I'll ***swing for the fence***,

"crush the bug," think, my ***right foot is calm at double-support, left then right***,

"push your hips forward," think, I know some Russian, ***Tas Nazat***, hips back,

"work on your footwork," think, footwork, I don't need no stinkin' footwork,

"you should do 4 turns," think, 3 were good enough for Yuri; 3 are good enough for me, and

"no one can throw like Yuri," think, ***yes, I can***.

Good luck with your training and ***keep your eyes on the ball*** and

Swing, Swing, Swing, Swing!

.

Afterword

There will be some challenges for you as you learn the **Ukrainian Swing** technique properly. These challenges may not come to mind when you think of huge, muscular throwers spinning around at super fast speeds. Believe it or not, the major challenges for you will be **patience** and **timing**. Just like when you shift gears, [manual transmission], in a car from 1st, 2nd, 3rd and 4th, you'll need to be **patient** and **time** when you shift the gears until you reach your maximum safe speed. This is true in the **Ukrainian Swing**, too. **Don't try to do it all in one turn.**

Words of Wisdom from Yuri

To paraphrase Yuri from page 27 in his book with co-author, Dr. Vladimir Strelnitski, **Art and Science of Hammer Throwing**, Sept. 2018:

*Your hammer is your partner. You must trust and respect it. You must also muster up the courage within yourself to throw the hammer. **Trust, Respect and Courage.***

To quote Yuri from page 61 in this same book:

I may surprise and even frustrate many athletes and coaches, but from my long experience, I came to the conclusion that, however paradoxically it sounds, the very best "auxiliary" exercise for hammer throwing is ... hammer throwing.

These are words of wisdom because there is nothing that can build "hammer throwing muscles" and develop "hammer throwing speed" like hammer throwing. Lifting weights may give you good basic strength, but very few, if any, lifts are as quick and dynamic as hammer throwing. The

hammer throw is a 4 dimensional event, "3D changing over time." No two winds are alike. No two turns are alike. Each one has its purpose to ***gradually*** change the inclination and speed of your hammer until your explosive delivery and release. Remember to be ***patient and relaxed***.

And above all, please have fun and enjoy the challenge of learning to throw the hammer, no matter what technique you choose. After going through this guidebook, please, consider the ***Ukrainian Swing*** as one of your choices.

Appendix A

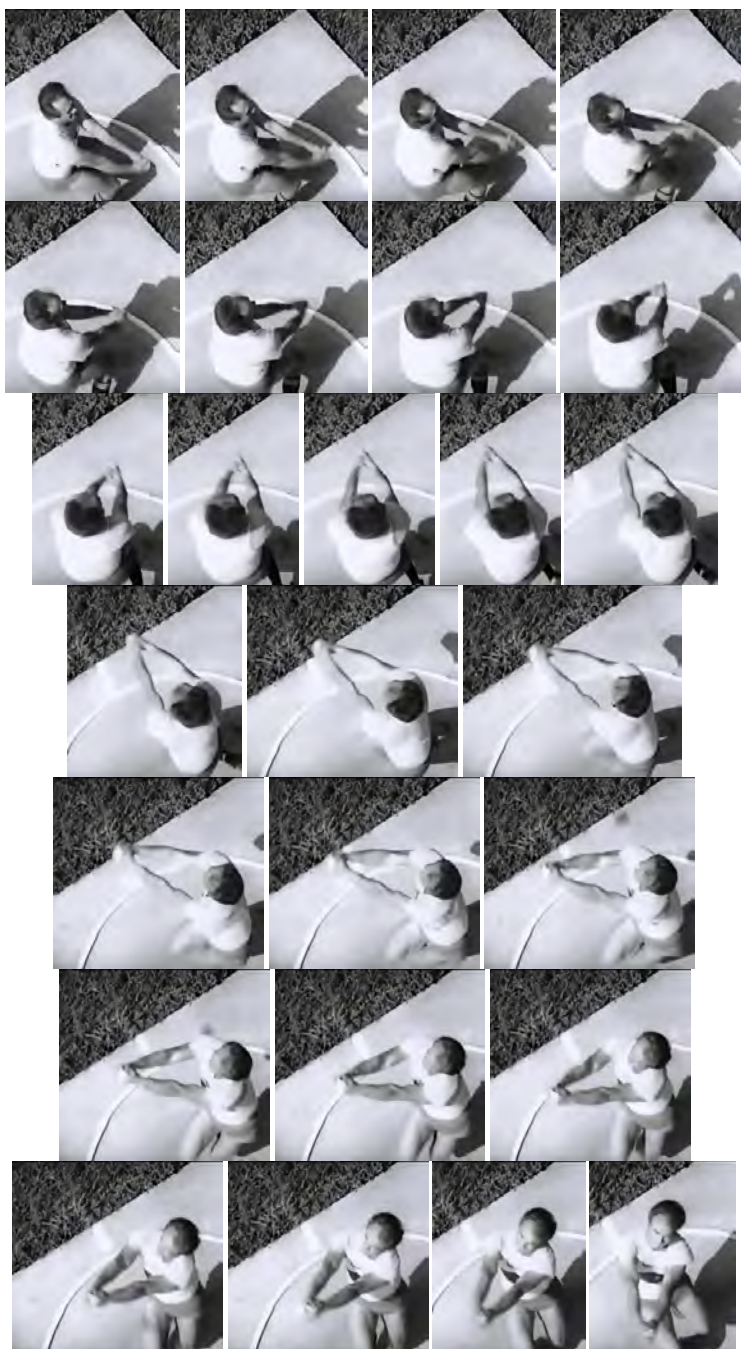
Water Drop from Above in Action

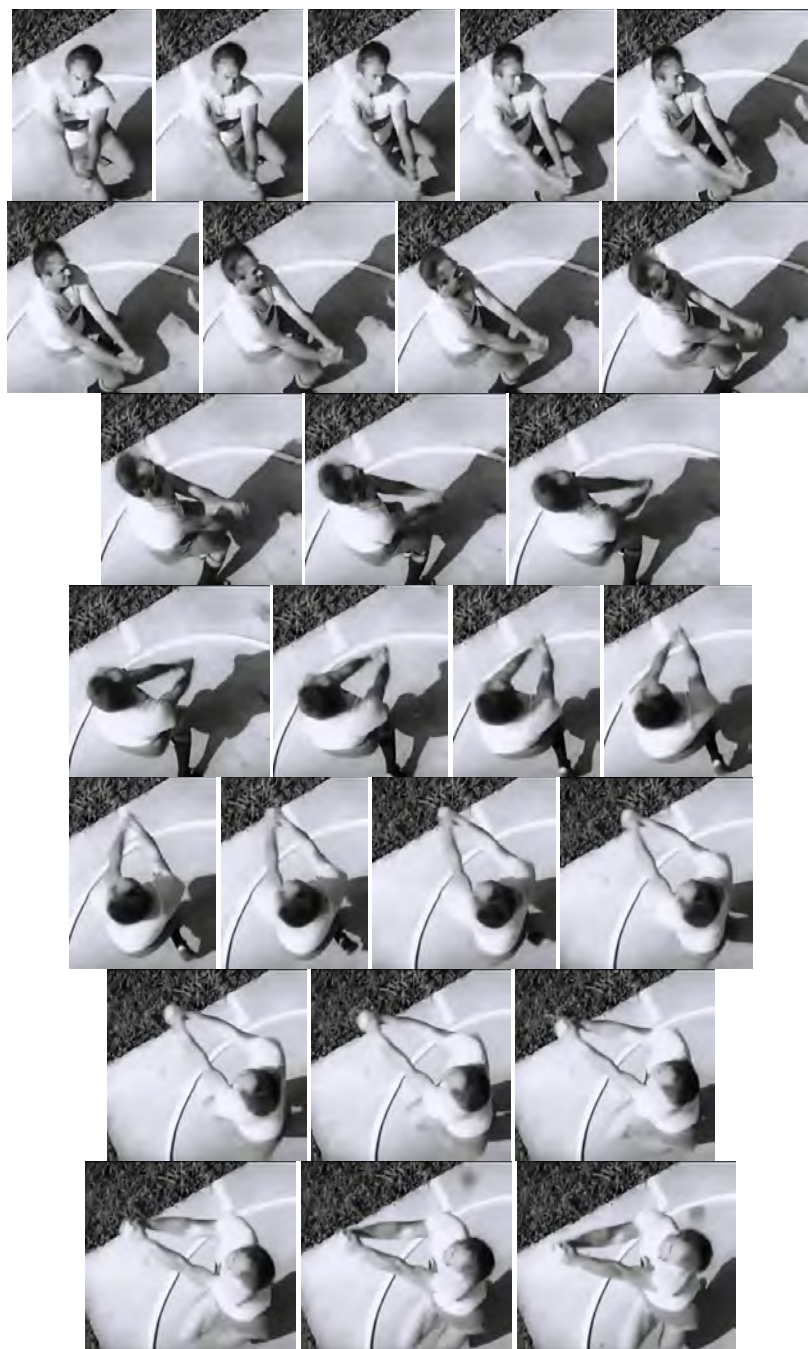
This shows the ***water drop***, eyes looking at the hammer with ***relaxed shoulders*** and ***long arms***, maintained by Yuri during his entire throw. It also shows how he provides his ***Powerful Pendulum Phase*** with a ***stable pivot point*** that makes his hammer ***swing*** freely like a ***pendulum*** during its ***downswing*** assisted by ***gravity***, and with a little help from him. His ***patience*** and ***timing*** are evident as he ***swings*** his hammer and lines up his ***stable and strong neutral points at 0°***. You can also see how he ***leans and falls backward*** to help his hammer rise during its ***upswing***.

Although the snapshots are from above, you can get a feel for how high Yuri ***swings*** his hammer to its ***high point at 180°***. This gives his hammer plenty of ***potential energy***. And then with the help of ***gravity***, this ***energy*** is transferred into ***kinetic energy***. You can also see his ***powerful delivery and release*** as he "puts on the brakes" and transfers ***rotational momentum*** into ***linear momentum, forcing*** his hammer to blast off like a rocket.

The first picture is when Yuri is at his first ***balanced position at 90°***, his ***winds*** and ***Ukrainian Swing*** are not included for this example. Just imagine his ***powerful swing*** into the first turn.



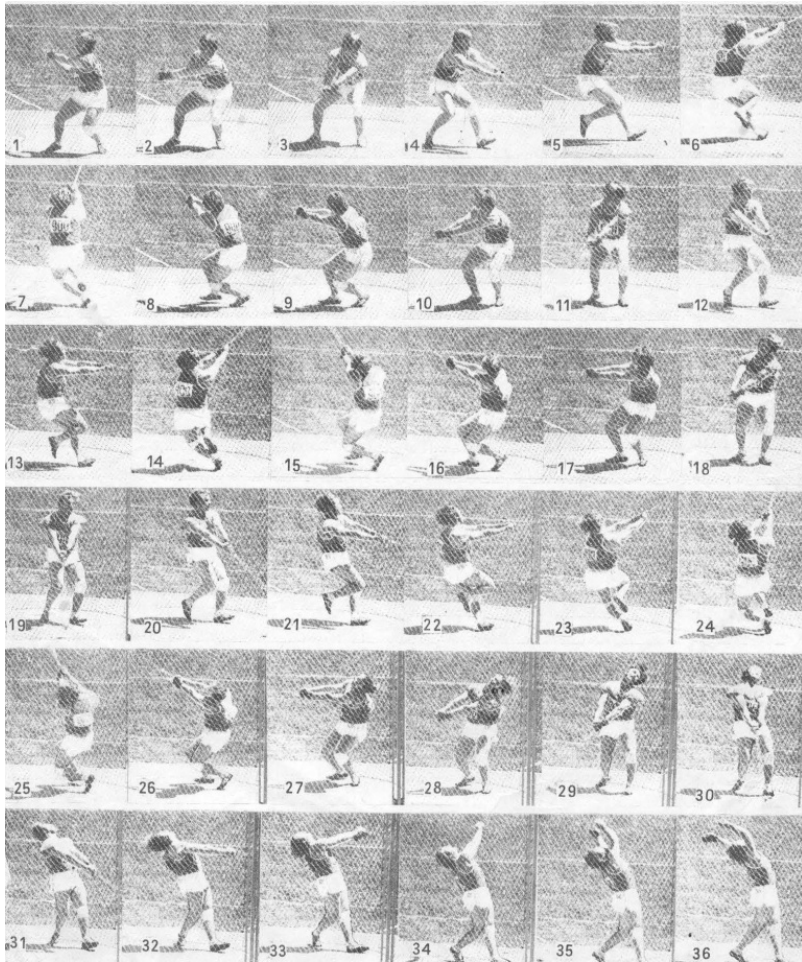






Appendix B

Legkaya Atletika, January, 1977. This is about two years after I had met Yuri in Rome, Italy.



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Ukrainian Swing



Swing, Swing, Swing, Swing!