

# OHIO ATLATL ASSOCIATION

## Atlats, by Ray Strischek

**ATLATL:** The ATLATL is the stick used to cast the DART. The Atlatl is the launcher, the dart is the projectile missile being launched with the use of the hand held atlatl.

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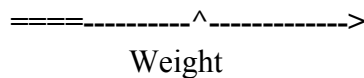
Below are some talking points about just the atlatl.

<b>Handle :</b>	<b>Shaft:</b>	<b>Spur:</b>
Hammer Grip	Flexible	Male/ Female/ Neutral
Basketmaker Two	Rigid	Spur Angle
Single Hole	Elastic	Ball and Socket vs Needle Point

**Material**

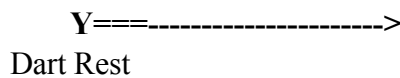


**The Atlatl Weight:**



Amount of Weight  
 Placement on Atlatl Shaft  
 Atlatl Weight Function

**The Dart Rest**



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**THE THEORY:**

When throwing a spear with the hand alone, velocity is produced first by the arm and shoulder moving the spear forward, building up momentum. Velocity then receives a final boost in momentum building (torque) from the flick of the wrist at the end of the throwing motion.

The original intent of the Atlatl was to increase the force of throw for **greater penetration** into tough ice age hide. By increasing the length of the wrist being flicked (atlatl in hand = longer wrist), greater torque would result when wrist did flick, thus vastly increasing velocity.

Serendipity: increased velocity also means increased effective range.

**Counter Theory:** The original intent was to **increase the distance** between an angry wounded animal and the person throwing the spear. By increasing the length of the wrist being flicked,

greater torque would result when the wrist did flick, thus vastly increasing effective range.

Serendipity: increased effective range also means increased penetration.

There is little about the atlatl and dart that does not produce the kind of chicken-and-egg theories I note above. I will try to control any further impulses in that direction. But, be warned. If you spend any time at all delving into scholarly tracts on the atlatl and dart, you will constantly run into such competing theory ironies more often than finding any useful how-to advice.

The three main parts of the Atlatl are the **HANDLE**, the **SHAFT** and the **SPUR**.

There are two other optional parts to consider; one is the **ATLATL WEIGHT**, the other **THE DART REST**.

The **handle** is obviously the part of the atlatl held by the hand.

The **shaft** is the part between the handle and the spur.

The **spur** is dull point carved into or added onto the end of the atlatl. The spur point or tip fits into a hole (or CUP) in the butt end of the dart.

Atlatls on record range from 6 inches in length to 4 feet in length (while darts range from 4 feet to 13 feet in length, feathered or unfeathered). There is probably an Aeffective usage@ correlation between atlatl length and dart length but no serious attempt has been made to devise a chart addressing any definitive correlation. Modern atlatlists= atlatls generally range between 18 and 36 inches in length (average about 24 inches) and use darts between 5 feet and 8 feet in length (average, or more popular, 6 feet to 7 feet).

The Atlatl may be **RIGID**, or the shaft may be of such design and material as to be either **ELASTIC** (some ability to bend) or **FLEXIBLE** (springy, like the bow of a bow and arrow).

**RIGID**: An atlatl made of a sturdy material that does not bend and is not flexible, such as a 2 foot long dowel rod, one inch thick, made of oak.

**ELASTIC**: A tall chimney made of brick can move back and forth in a strong wind. It is said a base ball bat bends a little when it hits a pitched ball. Some atlatl shafts are slightly tapered down from handle to spur, thus the atlatl shaft will bend a little during the cast. It is debatable if merely Elastic Atlatl Shaft can significantly enhance the result of casting a dart over the use of a rigid atlatl.

**FLEXIBLE**: Some materials are more flexible than others (bends further before breaking). . Some materials have more kinetic flexibility than others (how fast a material snaps back to its original shape after being bent). It is well known and accepted that a flexible atlatl shaft can enhance the performance of casting a dart with the atlatl. It is an open debate as to how much an atlatl should flex and how fast the atlatl should flex back in order to provide a distinct and significant

enhancement to the overall operation of casting a dart with such a flexible atlatl.

### **ATLATL GRIP:**

At the very beginning of the throwing motion, the spur's blunted tip rotates inside of and then out of the Acup@ or hole in the butt end of the dart. (Think Aball and socket@.) For much of the duration of the throwing motion, the dart butt is riding on the top surface of the spur, only nominally connected to the spur because the more flexible dart is momentarily flexing more than it is moving forward. (Think Ainertia@). The spur is some distance away from the handle of the atlatl, which is being gripped, pulled forward, and levered upward by the hand. Control of the interplay between the flexing dart and the moving, rotating spur, is virtually remote.

A good grip is supposed to prevent fumbling and slippage of the handle in the hand during the casting motion is imperative. There are basically only two atlatl grip styles. Hammer Grip, and Basket Maker II Grip.

**HAMMER GRIP.** The handle of the atlatl is held as if it were the handle of a hammer. The four fingers are on one side of the handle, the thumb is on the opposite side. Handle texture, leather loops, pegs, ergonomic sculpting of the handle can provide greater grip control.

**BASKET MAKER II GRIP.** The atlatl shaft passes between the first and second finger. The first and second finger may pass through leather loops, or wrap around pegs, or through holes carved into the atlatl handle. However the first and second finger are engaged, the atlatl shaft passes between them.

**THAT IN-BETWEEN GRIP.** I hesitate to mention it. People like it when you talk black and white, this or that, no split hairs, no grey areas. They get edgy when you give them more options to sift. But, well, here goes.

**THE SINGLE HOLE GRIP.** In the middle of the atlatl, a single hole for the number one finger. Its not quite Hammer Grip and not quite Basket Maker II. If you hold your arm up in the air in an AL@ shape, pretending to hold a Hammer Grip atlatl, and then rotate your wrist and fist around to get into the Basket Maker II position, you will pass right by the Single Hole Grip position. Maintain that AL@ shape and as you rotate your wrist and fist back and forth between Basket Maker II and Hammer Grip positions, please note what the muscle mass and tendons from fist to elbow are doing. They are changing! What might that mean in terms of greater control, or greater force of throw, or getting a case of Atlatl Elbow? Single hole atlatls are rare, being found only in Florida and South America, so far.

I have recently started making and using the Single Hole Grip variety of atlatl and note that it is a different feel altogether, but so far, has as many advantages and disadvantages as the Hammer Grip and Basketmaker II Grip. So far, the change to Single Hole Grip has had no noticeable effect on my accuracy at all. The difference, such as it is, is that the Single Hole Grip makes me feel like I am throwing a spear rather than launching a dart with an atlatl. Too bad. I was kind of hoping for

an accuracy miracle there.

Atlatl handles can be rod shaped, rectangle shaped, wedge shaped, paddle shaped, all with or without holes drilled into or through them, with or without pegs, with or without leather loops, smooth or rough finished, and even sculpted into ergonomic or abstract animalistic shapes. The whole idea behind so many atlatl handle shapes and treatments is a curious fact directly related to the throwing motion. No matter what, during the casting motion, the handle is going to shift around in the palm of the hand,,,,, and,,,,, the base of thumb, the tip of the thumb, and the remaining fingers are going to change the amount of pressure applied upon the atlatl handle, and even shift their position on the atlatl handle, during the casting motion.

I have yet to meet any modern atlatlist who is completely satisfied with his/her grip control design or who has not complained of missed shots due to the unavoidable gripage-slippage that takes place during the casting motion. The most often complained about digits: The thumb and pinky finger. If only the thumb were not so opposable or perhaps in the pinky were longer,,, ah well, nobody said this was going to be easy.

It is of course a matter of debate as to which grip style is better. There are of course, parameters even in grip control. Too much grip, not enough grip. The hand must pull the atlatl and dart forward, then lever the atlatl up and forward, then flick the atlatl sharply downward at the end of the cast, all in one smooth, momentum building motion, all the while forcing and controlling a reluctant flexible dart into an angle of elevation and direction towards a specific target. While all this is going on, the amount of gripping pressure and location of contact on the atlatl handle, for each of the fingers, for the thumb, the base of the thumb, and the palm of the

hand, necessarily go through varying degrees of changes. Does your atlatl handle design give you the kind of grip control you need? Does your grip style (Hammer or Basket Maker II) work with your grip handle design?

**SPUR:** The little pointy thing on the back end of the atlatl which is inserted in the Acup@ or hole in the butt end of the dart.

There are three basic types of spur. **Male** (sticks out from and usually above the atlatl shaft), **Female** (is carved into the existing top surface of the atlatl shaft itself), and **Neutral** (carved out of the atlatl shaft itself except that the atlatl shaft in front of the spur is carved down below the height of the spur). The most numerous (popular?) type of atlatl spur is the Male form. Beyond that, all is variability. Spur material can be wood, bone, stone, or metal. The spur tip, can be pointy needle shaped, or blunt and ball shape. The top surface of the tip of the spur can be round, or flat, or have a groove or flute carved into it. The spur can be part of the atlatl shaft itself, or glued or lashed or pinned onto the atlatl shaft.

The purpose of the spur is to **momentarily** engage the butt end of the dart prior to the start of the casting motion. As the casting motion begins, **the spur should easily rotate around inside the Acup@ or hole in the butt end of the dart, and then out of the Acup@ altogether.** The dart

butt should then ride and perhaps slide on the top surface of the spur, until the dart separates from the atlatl.

**A bad spur design** is one which interferes with the casting process. During the casting motion, a needle point spur tip may rip or tear at the butt end of the dart. Lashings holding the spur to the atlatl shaft may catch or snag the bottom lip of the Acup@ of the dart. Any atlatl shaft material extending beyond or behind the spur may smack down onto the top of the Acup@ prior to dart and atlatl separation. A rounded shouldered top surface behind the spur tip may allow the dart butt to slip off one side or the other of the spur prior to complete separation of the dart from the atlatl.

Very basically: the size and shape of the tip of the spur must have a direct and complimentary (easy in and easy out) relationship to the shape and size of the Acup@ or hole in the butt end of the dart.

**The angle of the spur**, relative to the atlatl shaft makes a difference in how the dart behaves. A spur parallel to the atlatl shaft requires the dart to be aimed/angled higher than a spur angled at 30 degrees relative to the shaft. A spur angled at 45 degrees can be lashed and have some atlatl shaft behind it without causing any snagging or smack down problems because by the time the atlatl is levered far enough forward and end over end, the dart has already separated from the atlatl.. However, it is more difficult to hold the dart back upon an a more steeply angled spur prior to starting the casting motion, than it is to hold a dart onto a spur that is more parallel to the atlatl shaft.

On the other hand, a DART REST built into the atlatl handle, can free up one or all fingers from the need to hold the dart to the spur prior to the casting motion.

**THE ATLATL WEIGHT:** Probably nothing about the atlatl and dart sparks more debate than the Atlatl Weight.

What it is:

It could be a rock, raw from the river or much worked over into a sculpted masterpiece. Or a raw or carved up piece of bone, or antler, or pottery, or metal or **anything** else for that matter, having some weight (highly variable) and in some matter **added** to the atlatl, or not. The atlatl weight could actually be a carved part of the handle, or a bulge in the shaft, or a part of the spur. And there may be more than one weight. Generally though, the atlatl weight is something **added** to the atlatl, being lashed on or glued on or both.

What it does:

Well now, that **is** the problem. Many scholars and/or atlatl enthusiasts of note have sifted the evidence and options to hell and back, sometimes vigorously denouncing each other=s theories, always defending their own just as intensely, or, they simply present their own theory mixed in

with others, as I do here, in hopes of avoiding a predictable back lash, or, they avoid the problem altogether by declaring the atlatl weight to be a **Aproblematic object@**.

The theories, generally speaking, or, simplistically speaking, as in over simplification:

1. **Increases velocity/distance**. Problem: The test results are conflicting. In some cases, adding the atlatl weight did increase velocity/distance. In others, velocity/distance was reduced. How can that be? Try tying a concrete block to your atlatl, and then go check your velocity/distance. (Tests documents indicated the testers used everything from 10 grams to 1000 grams as weights, different darts, different atlatls, and vastly different levels of atlatl/dart expertise.)

Actually, most testers did experience a **slight** increase in velocity/distance with 15 to 50 grams of weights, and, the few that went on to heavier weights reported losses in velocity and distance.. None of the tests were atlatl and dart accuracy oriented. They were only velocity/distance oriented.

2. **Tuning the flexing oscillations or vibrations of the elastic or flexible atlatl shaft to flexing oscillations or vibrations of the dart shaft so as to achieve maximum atlatl/dart launch/flight efficiency**, in much the same manner and for much the same results as a diver might adjust the tension in a diving board to achieve spring board perfection in his/her dive. Not many have attacked this theory, perhaps because its author won't put up with any guff from anyone, and perhaps because the theory sounds like it makes a lot of common sense.

I certainly wouldn't want any of my guff stomped out of me so I will wait patiently until an attempt is made by the author to explain how the theory can be directly applied to accuracy, not just a model of maximum atlatl/dart launch/flight efficiency. Efficiency does not automatically equal accuracy. The reason I draw this line in the sand is because any atlatlist who has spent time throwing darts at targets at different distances, up hill and down hill, low to the ground and high off the ground will tell you, that they have to tweak or choke or adjust their technique of casting a dart to accommodate such target changes.

3. **Centrifugal force**. During the entire casting motion, the atlatl weight counters the forces of the flexing dart playing on the spur of the atlatl, which is so very far away from the control point of the atlatl (the hand on the handle), thus providing a smooth, wobble-less casting motion, greatly aiding accuracy. Since this conforms to my own sacred beliefs/practical observations on the subject, I naturally think this theory is the cat=s meow.

4. **Counter balance**. The weight exists so that someone stalking a deer can hold the atlatl and dart in a horizontal position for a long time without getting tired. As anyone can see, two thirds of the dart is hanging out past the front end of the atlatl, creating an imbalance. The atlatl weight on the atlatl shaft balances out the weight of the atlatl and dart at the hand/handle point, thus allowing the hunter to remain motionless as long as it takes to get the shot profile necessary for the kill.

5. **Fetish or ceremonial emblem of rank**. Some weights are so small and light, (an extra dart

point or half a walnut husk, or small stone the size of a pea), as to make one wonder what effect if any the addition of the object would have on the normally un-weighted function of the atlatl and dart. Some or so heavy (1000 gram crescent shapes) that attempting to use it would probably separate arm from shoulder. Kiss that rotator cusp goodbye. And some weights are so beautiful or sacred or fragile looking that the possibility of breaking it would head trip its way into ruining every cast.

My final conclusion about the form and functions of atlatl weights is that perhaps it=s a little bit of all of the above.

Where do you put the atlatl weight?:

On the handle, on the shaft, on the spur, and everywhere in between. Use as many or as few, or as much or as less weight as seems appropriate and/or beneficial. (Start by putting a single weight of 25 grams in the middle of the shaft between your hand and the spur, or 15 grams way out on the spur end. Use duct tape. Throw a lot. Move the weight around. Change the weight=s weight. Try more than one weight. After awhile, you will notice that the weight does have an effect on the mechanics of the throw. Ponder, as other have done and still do, the effect of the weight on the mechanics of the throw, and then join in the debate, knowing that you are as much an expert on the subject of the form and function of the atlatl weight as anyone else already published.

(Word of warning: Even though the archeological record indicates weights up to 1000 grams, I personally suggest you use no more than 70 grams. I once used 200 grams and came down with **ATLATL ELBOW** for nine months. The only way I was able to get rid of this incredibly painful malady was to immediately decrease the amount of weight which only helped a little **and** eventually (9 months later) switch from Hammer Grip style to Basketmaker II Grip style. Upon doing so, the Atlatl Elbow went away in 3 days.)

**DART REST:** The hand holds the atlatl, the dart rest holds the dart. They don=t get in each other=s way. Or, suffer, and do it the old fashion way.

The most common old fashion method of keeping atlatl and dart together prior to the start of the casting motion is to:

Step 1,a. Squeeze the dart shaft between thumb tip and tip of the first finger,,,,,,,,,,,,,

Step 1,b. while using the pressure of the thumb and finger tip to push the dart to the rear in order to keep the dart butt from slipping off the spur,,,,,,,,,,,,,

Step 1,c. while gripping the atlatl handle with the three remaining fingers and the base of the thumb (Hammer Grip).

Step 2. Start the cast.

Step 3,a. Almost immediately after starting the casting motion, the thumb tip and the tip of the first finger releases the dart,,,,,,,,,,,,,

Step 3,b. to re-join the other three fingers and base of the thumb in gripping the atlatl handle during the remainder of the casting motion.

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Please note that all the commas in Steps 1 through 3 above are intentional, intended to imply that **while casting a dart the old fashion way, there= s a whole lotta finger flappin goin on.**

In the Basket Maker II version, the dart is either resting tamped down between the knuckles of the first and second finger, or being squeezed between the tip of the thumb and the knuckle of the first finger. Still, the dart must be pushed to the rear to remain seated on the spur.

**Dart Rests are rare and perhaps only implied in the archaeological record.** Our European counter parts in the W.A.A imply that some atlatls may have been curved to such an extent the front of the atlatl was high enough above the gripping hand that a AV@ cut could be made in the tip of the handle of the atlatl which could have been used as a dart rest for which only one finger would be needed to hold the dart in place prior to the start of the cast.

Atlatls found in Peru, have a bird shaped object lashed onto the handle, beak facing the rear, large round Apop-eyes@ in its head, upon which, either side, the dart shaft could have been held in place with one finger.

Atlatls found in New Guinea had abstract parrots and other animals fixed to the side of the atlatl just behind the handle. A thumb could push the dart against the these side boards prior to the cast, thus using them for dart rests.

In Alaska, some throwing boards have channels running the length of the atlatl, and at either end there is a hole drilled through the channel. The belly of the dart has two pegs which match the two holes. The dart shaft lays in the channel, the two pegs set in the holes, thus a dart rest which does not require much finger or thumb assistance to make the dart (harpoon) stay put prior to the throw.

Still, there are no obviously designed dart rests yet discovered in the archeological record that match the obviously designed intent of what modern atlatlists are using today, in the way of dart rests:

1. A AY@ shaped object, 1 2 to 3 inches high, on the top of the atlatl handle, in which leather is glued to the inside of the AY@. The dart shaft rests in the AY@. No fingers are needed to hold

the dart shaft in place prior to the cast.

2. A AU@ shaped channel in a part of the handle above the hand in which the dart shaft rests, sometimes held in place by a single finger.

The whole purpose of the dart rest is to reduce or eliminate the need to use any or at least no more than one finger to physically hold the dart to the atlatl prior to the throw, and also to eliminate as much as possible any need to re-grip the atlatl handle or shift the grip on the atlatl handle after the cast has started, and to eliminate the worse case scenario of having the use of only the three weakest fingers and the base of the thumb in gripping the atlatl while in the middle of the casting motion. **Grip control equals accuracy.**

### **MATERIALS:**

Atlatls are made primarily out of wood. For a rigid or merely elastic atlatl, any wood can be used. For a truly flexible atlatl, it is wise not to use something brittle (such as Walnut) or something soft (such as Pine). Modern atlatlists have used the following woods with excellent results: Purple Heart, Osage Orange, Hickory, Maple, Bamboo, the wood of most fruit trees, and with varying degrees of success or brittle failure, Oak.

However, nearly any wood can be thinned down to the point of being flexible, but tropical rain forest wood (such

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as Purple Heart) has a kinetic flexibility (and beauty) that modern atlatlists like a lot.

Unlike the bow (of bow and arrow or cross bow), the stresses playing on the flexible atlatl shaft are not anywhere as severe.

Example: My flexible atlatls are 22 2 inches long, handle to spur. The flexing atlatl shaft is only 12 inches long, generally 1 inch wide. From the rear of the handle to the spur, the wood of the flexible shaft is 1/4 of an inch thick and is thinned to 1/8 of an inch at the spur. If I anchor the handle to a table edge, and tie a 3 pound weight to the spur end, the shaft will deflect about 6 inches. Some atlatlists (Andy and Doug Majorsky of Derry PA) actually use half of a child=s fiberglass bow (15 pound bow) as an atlatl. It is less flexible than my own.

The most flexible atlatl I have ever seen is made by Chuck Butorajac of Ligonier PA. It is no longer in length than mine and the flexible portion is made of OAK, about 2 inch wide and 1/4 of an inch thick at its thickest point coming out of the back of its crushed walnut husk, molded handle. Chuck tried the same test I used, anchoring the handle on the edge of a table, and tying a 3 pound weight to the spur, but after the shaft rapidly deflexed 6 inches he became concerned and stopped the test before it went any further, fearing that the 3 pound weight would break the shaft.

Chuck Butorajac, Doug Majorsky, and I all use River Cane darts nearly 8 feet in length and weighing between 4 and 6 ounces and we have never experienced a flexible atlatl shaft breakage.

Andy Majorsky uses fiber glass darts made from sea bass fishing rods about 7 feet in length and weighing between 4 and 5 ounces. Andy Majorsky has never experienced a flexible atlatl shaft breakage.

I am not saying it is impossible, during the normal course of the throwing movement, to have a thin atlatl shaft break. Certainly, if you used pine or oak, or cedar or some other soft wood with coarse grain or brittle cell structure, an atlatl shaft could be made that would break. All I am saying is that the flex/stress/strain of casting a dart with a flexible atlatl is very much less than that of a flexing archer's bow.

Bottom line:

In the archaeological record, the real world of the past, people used whatever was available to make atlatls, including bone. In the real world of these modern times, the material options are simply more numerous.