The ATLATL

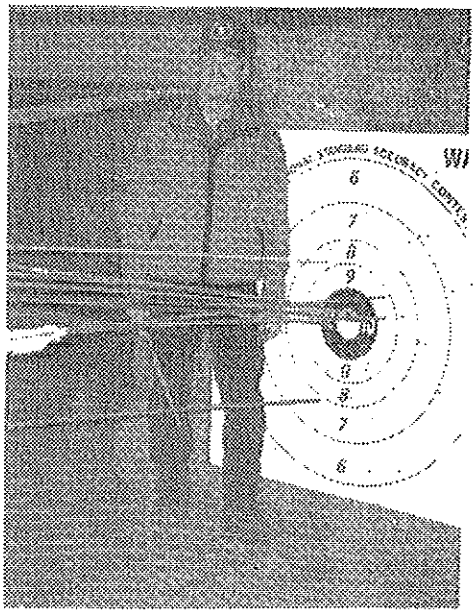
"Too long have I hunted mammoth alone!"
Rich McWhorter

January 1999 THE NEWSLETTER OF THE WORLD ATLATL ASSOCIATION, INC. Vol. 12 No. 1
1390 South Paris Court, Aurora, Colorado 80012, USA
BILL TATE, EDITOR

NOW IN OUR 12TH YEAR

GARRY FOGELMAN - TOP THROWER

By Lloyd Pine



Gary Fogelman, standing before the ISAC target with spears replaced in holes made in his championship throw showing grouping. (Photo by Margie Takoch)

In his last contest of the year, November 11th, **Gary Fogelman** moved into first place in the 1998 International Standard Accuracy Competition (ISAC) with a score of 93-2X. This beat out **Ray Strischek's** 93 score, which had been on top since early June, and pushed Strischek into second place. Ironically, Fogelman's 93-2X tied Ray Strischek's winning score for 1997.

Courtney Birkett won the ladies division with a score of 67. Last year's winner, **Aude Labarge** of France, placed second with 63 points.

Scores, overall, continue to improve with four people throwing in the 90s, versus only one last year. In 1996, the first year of the competition, only two people threw scores of 80 or higher. This year, there were 22. A total of 49 contestants scored 70 or better this year compared to only 15 in 1996. The top ladies scores were not as high as last year, but the total number of women competing and scoring above 50 increased significantly.

Some of our competitors under 16 years of age also achieved outstanding scores. **Thomas Chauvaux** of Belgium, is to be congratulated for his 73-X. **Alex Pritchard** and **Tesha Keefer** scored 53 and 52 respectively in the Ladies Division. (With last names like Chauvaux, Pritchard and Keefer, it makes me wonder if there is a genetic component in atlatl skill.)

Scores were received from 87 different contests, and I know of several others that were held without submitting scores for record. This comes close to doubling the number of contests over the previous year.

Below is a complete listing of the top ISAC competitors with special awards going to those highlighted:

score	equip.	name	from
93-2X	P	Gary Fogelman	PA, USA
93	P	Ray Strischek	OH, USA
92-3X	P	Pascal Chauvaux	Belgium
90-X	P	Charlie Brown	CO, USA
89	O	Bob Berg	NY, USA
88	O	Terry Keefer	PA, USA
87-X	P	Chris Pappas	NY, USA
87-X	P	William Hobbs	UT, USA
87	P	Jean Speckens	Belgium
85-X	O	Lou Becker	MI, USA
85-X	O	Jim Gilligan	MI, USA
84-2X	P	Jeff McGill	UT, USA
84-X	P	Mark Bracken	GA, USA
84	O	Ron Mertz	MO, USA
84	P	Denny Bard	PA, USA
84	P	Ray Madden	MO, USA
82	P	Mike Glenn	OH, USA
81-2X	O	Chris Oberg	MI, USA
81	P	Gernard Gnelli	France
81	P	Patrick Bidart	France
80-X	P	Chuck Butorajac	PA, USA
80	O	Roger Klindt	NY, USA
79-3X	P	Paul Gleckl	PA, USA
79	P	Laurent Bernat	France
79	P	Olivier Brasseur	Belgium
78	O	Jim Ray	MT, USA
78	P	Pascal Rouzo	France
77-X	O	Martin Strischek	OH, USA
77	O	Victor Ahearne	MI, USA
76-2X	P	Dean Pritchard	ID, USA
76	P	Alain Selekaerts	Belgium
76	O	Richard Lyons	IN, USA
76	O	John Whittaker	IA, USA
75	O	Don Roberts	OH, USA
75	P	Robert Hamilton	UT, USA
75	P	Serge Vigier	France
74	P	Alain Grospiron	France
73-X	P	Thomas Chauvaux*	Belgium
73	O	Tom McLaughlin	WV, USA
73	O	Mike Petrucha	MI, USA
73	P	Ken Wee	CO, USA
72-X	?	Tony Ostronski	MI, USA
72	P	Jerome Galletti	France
72	O	Greg West	MI, USA
72	P	Uli Weigel	Germany
70-X	P	Ulrich Stodiek	Germany
70	P	Jean-Francois Peres	France
70	P	Steve Cabaraux	Belgium
70	P	Barry Kimball	CO, USA
		Women's top scores	
67	O	Courtney Birkett	PA, USA
63	P	Aude Labarge	France
62	O	Toni Roberts	OH, USA
61	P	Susie Brown	CO, USA
54	P	Florence Cavalin	France
53	P	Alex Pritchard*	ID, USA
52	P	Catherine Cretin	France
52	O	Kay Inman	NY, USA
52	P	Tesha Keefer*	PA, USA
52	O	Kerri Meldron	MI, USA
51	P	Sharon Keefer	PA, USA
50	O	Tina Mengon	ID, USA

* Under 16 years of age. (Equip. O = Open, P = Primitive)

HINTS ON FILLING OUT THE ISAC SCORE SHEET

A properly filled out, easy to read, score sheet is the heart of our record keeping. The quality of the sheets has been getting better each year. However, there are some errors that have been repeated enough that I thought it might be worth while to point them out. First, please use an **official score sheet.** Having a uniform format makes the data entry faster and helps reduce errors. There are several versions of score sheets out there that claim to be "official." Starting in 1999, the official score sheet will have on it "REVISED JANUARY 1, 1999." None of the older versions should be used.

Fill out **complete** information on each competitor. Put down the city and state, use either "F" or "M" to denote gender. If the competitor is under 16 years of age, **write in their actual age.** Many of the score sheets come in with just a check mark for age. The WAA Board would like to give more recognition to our young competitors, but the last year's data are very incomplete. Please **print** all of this information and make sure that it is easy to read. The score sheets must be clear enough that a copy can be made that is also readable. Legibility has been a major problem.

When a competitor scores an "X," put an "X" on the score sheet rather that a tiny x beside it. All too often the "Xs" do not become part of the total score. I check the sheets for this error, but I cannot be counted on to catch it every time. The revised score sheet will list "X," rather that 10X as the proper way to score this kind of throw.

Finally, check that the total score is correct. I have had several competitors phone me about their scores either being not listed in the newsletter, or listed incorrectly. I do want your calls, if you feel that I have made a mistake. We handled over 200 score sheets in 1998, and while a good quality score sheet is a big help, some mistakes may still be made. Although cross-checks between our data entries and the listing I submit to Dean Pritchard for posting on his web page, errors do creep in. If you find a discrepancy in the listing, please bring it directly to my attention.

Note that there are some minor changes in the rules for 1999. All contest organizers should obtain both rules and score sheets that are labeled "Revised January 1, 1999."

Address correspondence to Lloyd as follows:

Lloyd Pine
5858 Berkshire St.
Baton Rouge, LA 70806

LENGTHS NOT TO GO TO IN ATLATLS

by Courtney Birkett

I once attributed my success in throwing darts accurately to the length of my atlatl, which was longer than most. But does length really affect the accuracy of throws? Does greater length increase the distance a dart can be thrown? I decided to try throwing darts for both distance and accuracy with atlatls that were different lengths, but the same in all other respects, and see what happened. I expected the accuracy to be best with a medium-sized atlatl, since a longer one might be awkward and I expected the distance of the throw to increase with the length of the atlatl. As I found out, this is not exactly the case.

The first requirement for the experiment was obtaining atlatls of different lengths. With a lot of help in their manufacture, I made five atlatls ranging in half-foot increments from 1 to 3 feet. They were as alike as possible except for the length. Next, I selected 10 darts of approximately the same weight and flex. To collect my data I threw all of the darts in sequence with one atlatl, then with the next, and so on. For distance, I threw them out into the football or rugby field and measured how far they went. For accuracy, I used the ISAC target and recorded which circles on the target the darts hit, if any.

I found out from this experiment that there is a good reason why giant atlatls have never been found archaeologically. Extreme sizes are hard to use. The lengths of more that two feet felt heavy at the back when I got ready to throw, although over time, the 2.5 foot one became more comfortable. The 3-foot atlatl was especially inconvenient and unwieldy. The weight and its distribution affected my throw so that instead of having a normal follow through, my wrist just flopped over, which probably affected the distance. This size also made my wrist hurt, sometimes even at times when it had been days since my last throwing session. Anyone using it for an extended period of time might end up with medical problems.

The tiny atlatl was also awkward. It was so short that I had to hold the dart at the feathers, which affected my grip so that sometimes the dart fell off when I was getting ready to throw. A dart nocked on this atlatl felt heavy at the point because I was holding the dart too far back for it to be balanced. I kept trying to support the dart with my ear. I was unable to throw very far with this size, so most of the time I do not know what score I would have gotten for accuracy because the dart never reached the target in the first place. As time went by I must have gotten stronger, because I hit the target more often, but for the most part using this atlatl was hardly better than using my unaided hand.

The distance averages for the different lengths rose until the 2.5 foot atlatl and then fell off again, so size is a factor in the distance a dart can be thrown, but excessive length is counterproductive. The accuracy data presented more problems. When I looked at the mean of all the scores, the 1.5 foot altatl seemed slightly better, but when only actual hits were counted (I missed a lot because it had been months since I last practiced) the 3-foot one seemed best. However, I felt that the 3-foot atlatl was one of the worst and that a few lucky shots are distorting its real accuracy. A larger sample of scores would probably clear up the problem.

For throwing longer distances, the longer the atlatl, the better – up to a point. After a certain length, a long atlatl becomes self-defeating. A different design with a lighter hook end might make slightly longer atlatls easier to use, but there are still problems of unwieldiness. A ridiculously long atlatl is not going to set a new record.

As for accuracy, any length could be accurate with enough practice, but very long or very short ones are probably not good ideas. If the atlatl is too short, so much effort is expended just trying to make the dart reach the target, that there is no time to concentrate on where it is going. Long atlatls can get the dart to the target, but they feel awkward. Although any size could work, personal comfort makes medium-sized the best for accuracy.

Now that I know for sure which sizes work best, I would recommend making the length of an atlatl about two feet. For distance throwing an atlatl can be slightly longer, but longer ones are harder to control, so they are not recommended for accuracy, where precision and control are more important than power. Make the whole atlatl and especially the hook end as light as possible without weakening it, to avoid wrist trauma. And then practice, because even the perfect length is useless without a competent thrower.

FIRST CONTACT -- Post Script

By Bill Tate

When the "gang of eight," as WAA President Charlie Brown calls us, went to France last Summer to meet and compete with the European spear throwers, we had no idea what to expect. As I mentioned in our lengthy report in the October issue of this newsletter, we were treated as royalty by Pascal and the others. Among the gifts we received were fire making kits from Jean Speckens of Belgium. Now I am not really a primitive technologist in any sense of the word. I waited until I got home to even try making fire with the flint and steel packaged in the leather pouch. To my utter amazement it worked the first time. That was a wonderful experience for me. Pascal Chauvaux and others showered all of us with gifts, some of which were indeed valuable, such as Ulrich Stodiek's monumental thesis on spearthrowers. My treasured copy of this 400 page book now sits prominently in my livingroom and has been examined by a wide assortment of archaeologists and other interested people. I have even taken my copy to distant atlatl competitions to show it off. Further, months after our return, Pascal sent us copies of photographs he took, of us in action at the competitions. These pictures stirred memories of that marvelous and educational trip. Once again, we extend our heartfelt thanks to Pascal and all of the others who made this memorable experience so wonderful.

LET'S EXERCISE THOSE
"ATLATL" MUSCLES
by Lou Becker

I often hear people complain about sore arms and shoulders from prolonged atlatl-dart throwing. A lot of this soreness could be eliminated by exercising the muscles associated with the use of the atlatl. If your arm and shoulder have been strained from trying to throw too many darts, the exercises described in this article will help you to come back strong.

So how does one develop the strength and muscle necessary to become a more skilled atlatlist? There are a few simple exercises which, when done regularly, will increase your strength dramatically in a very short time. "Ah," you say, "Here comes the pitch for the Charles Atlas course. In only three short hours a day, you too can look like this." Or, "For only $375.00, you can purchase a handy-dandy barbell set guaranteed to destroy all the floors in your home in only seven days." Not So! No, what I want to show you is a method of increasing your arm and shoulder strength in the absolute minimum of time. And, this method is neither as difficult nor as boring as you might think.

To begin with, the muscles you use to throw a dart aren't the ones you usually associate with strength. Doing hard physical work every day won't necessarily help your ability as an atlatlist. Of course, any general body strength you develop will help make it simpler to build the muscles you are going to need for improved atlatl dart throwing.

The muscles used for dart throwing, and in my opinion, in order of importance, are:

1. Trapezius -- This is basically your upper back and neck muscles.
2. Triceps – The muscles on the back of your upper arm, behind the biceps. (Feel both the underside and top of someone's arm when they have a dart ready to cast. You'll probably be surprised to find loose biceps on the top and tensed triceps underneath.)
3. Deltoid – This is the muscular cap of the shoulder at the juncture of the arm and shoulder.

To a lesser degree:

4. Forearm and wrist.
5. Pectoral – Chest muscle.
6. Biceps – Major arm muscle.

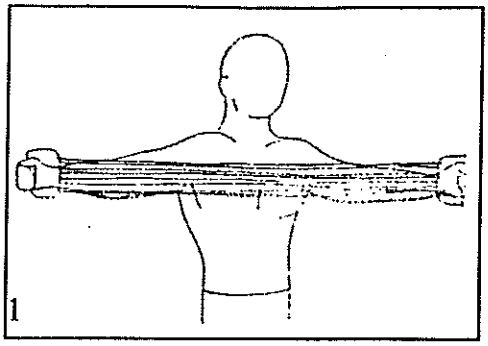
There are other muscles used as well, but these are the basic ones.

When you draw your atlatl back with a dart on the hook, you use the triceps and back or trapazius muscles. At the moment you come forward, your back muscles really come into play. At the moment the dart leaves the hook, your forearm and wrist are used strongly.

I have found that the simplest and most convenient way to exercise these muscles is through the use of a spring cable set. These are the gadgets you see in every sporting goods store and most discount houses. There are four or five parallel springs or cables, approximately 15 inches long, attached to a handle at each end. You'll hear them called everything from cable sets to chest pullers. Any of them will work. One very nice feature of the cable set is its portability. It can be tucked into a drawer or hung on a doorknob when not in use. I've thrown them into my duffle bag on numerous occasions for a little exercise while traveling.

Here's my program:

Exercise #1 – Front pull. Hold the cable straight out in front of the chest, just below eye level with the elbows slightly bent and stretch the cables until your arms are fully extended straight out from your shoulder with the cable stretched across your chest. Return your arms to their original position. This exercise works most of the muscles in your upper body, with particular emphasis on the chest and deltoid muscles.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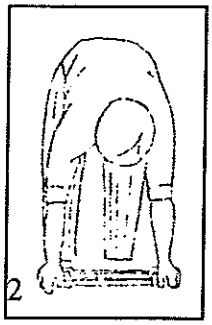
Exercise #2 – Bent-over pull. Bend over at the waist holding the cable set toward the floor, and fully extend your arms straight down. This exercise is similar to No. 1, except that you are bent at the waist while performing it. This movement almost totally isolates the trapezius or upper back muscles. I consider it the very best exercise I know. The triceps receive a good workout also. Be very careful on this one. Warm up with a few pulls using only one or two cables. It is very easy to injure the trapezius.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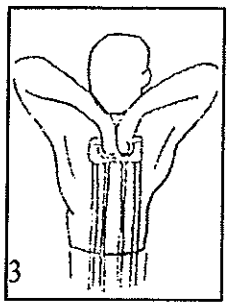
Exercise #3 – Upright pull. Place one foot through one handle, holding it against the floor. Hold the other handle with both hands in front of the body and pull the handle straight up to your nose. The elbows should be bent and pushed straight out from the shoulders. This exercise is very good for the deltoids and all of the upper body.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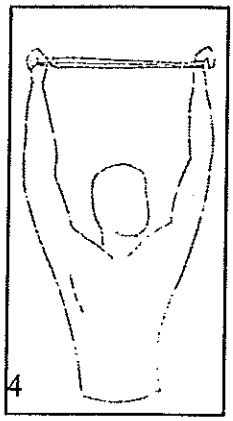
Exercise #4 – Pull downs. Hold the cable set as shown, arms overhead, knuckles turned inward, and stretch the cables until the arms are straight out from the shoulders, and your palms pointed toward the floor. Return to the original position. This exercise is good for the deltoids and to a lesser degree the triceps. Maintain as much muscular resistance as possible when bringing the arms back to the overhead position, it will double the benefit of the exercise.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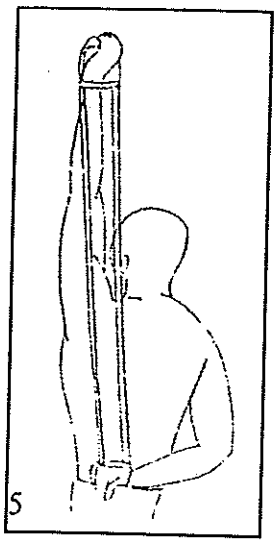
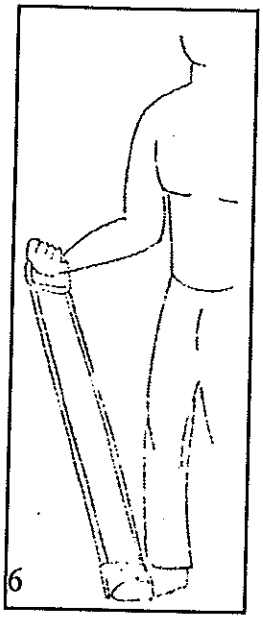


Exercise #5 – <u>One arm cable press.</u> Holding the cable set as shown, with knuckles turned outward, grasp your waistband and one handle with your lower hand. Push the other arm straight up until fully extended. Be sure you do an equal number of repetitions with each arm. This is a very good triceps exercise. Don't be surprised if you find it a difficult exercise.

Exercise #6 – <u>One arm cable curl</u>. Placing your right foot through one handle, grasp the other handle as shown with the right hand. Keeping the upper arm stationary, "curl" the lower arm up, touching the right shoulder. Return to the original position. Do an equal number of repetitions with the left arm.



<u>Recommended exercising procedure:</u> Try to exercise three times each week, such as on alternate days, Monday, Wednesday, Friday, etc. For the first two to three weeks, do one set of 10 to 15 repetitions of each exercise. After about three weeks do two to three sets of the 10 to 15 repetitions of each exercise. **Remember form is very important.** Start out with just one cable or spring, then try adding another after a couple of weeks. Temper your workout to your needs. Actually, any single one of these exercises will help your atlatl dart throwing ability simply because you will be exercising and building almost all of your upper body muscles. Along with these exercises, practice your dart throwing a few times each week. You will be more than pleased with the results.

WINTER COUNT'S A COMING

By Jo Guill

Winter Count, the winter season's equivalent to Backtrack's Rabbitstick rendezvous, will be here before you know it. This years Arizona event will be Feb. 8-13th. As usual, workshops will be held on many topics including: brain tanning, pottery making, tracking, quillwork, useful plants, flintknapping, fire making, basketry, and of course atlatls and darts. Contact Dave Wescott at (208) 359-2400 or e-mail <u>dwescot@aol.com</u> .

ON TARGET

by Leni Clubb

As you can see by the 1999 calendar, the atlatl season is in full swing already with contests starting in January–even a Wintertime event in Rome, Italy on February 7th. In order not to miss a contest between newsletter calendars that you might want to participate in, if you are on the "net," check Dean Pritchard's web site: <u>http://netnow.micron.net/atlatl</u> then click on the 1999 calendar of atlatl events. Dean updates every week.

It would be a good idea for contest organizers to check the newsletter calendar and Dean's list to avoid scheduling events in conflict with previously scheduled contests in your area. That way, eager throwers can participate in more events. It has been suggested that what we need is a "Regional Coordinator" in both the Eastern Seaboard and Midwest to avoid conflicts in dates.

We have nine WAA T-shirts left: six X-Large (46-48), and three XX-Large (50-52). The cost is $12.00 plus $3.20 priority mail postage. Contact me if interested. First come, first served.

By the time you read this, the 1999 rules for the International Standard Accuracy Competition (ISAC) will have been approved and will be made available to all contest organizers who contact me. It is important that <u>everyone</u> is on equal footing in the ISAC competition. Please phone, e-mail, or snail mail me for your copy. Leni Clubb, P. O. Box 56, Ocotillo, CA 92259, phone (760) 358-7835, e-mail <u>leniwaa@inreach.com</u>

ATLATL ART

Among the surprises your Editor received this past holiday season, was an unexpected sample copy of a hand-painted greeting card by Don Albert of San Antonio. This card, titled "Hunter and Atlatl," is available from Don as one-of-a-kind greeting card. Other subjects include hunters, gatherers, shamans, etc. Don's artistry can be seen on his web page at: http//ourworld.compuserve.com/homepages/vision_vessel To contact Don, e-mail him at <u>vision_vessel@compuserve.com</u> or write: Don Albert, 1023 Flower Forest, San Antonio, TX 78245.

There are two kinds of pedestrians...
the quick and the dead.

ATLATL EVENTS AROUND THE WORLD - 1999

Jan.	16	Hudson Valley Knappers Association, Knap-in and Atlatl Contest, Leeds, NY. Contact Rick Antonelli (518) 943-4317 or antcen@mhonline.net or Bob Berg (617) 687-4064.
Jan.	23	Bundle-up and Throw ISAC, Ligonier, PA. Contact Chuck Butorajac (724) 238-6878.
Feb.	6	20 Below Throw ISAC, Ligonier, PA. Contact Chuck Butorajac (724) 238-6878
Feb.	7	ARC.A ISAC Competition Rome (Center City), Rome, Italy. Contact Bruno Morucci or Pascal Chauvaux.
Feb.	8-13	Winter Count, 50 miles south of Phoenix. Contact Dave Wescott (208-359-2400 or dwescot@aol.com
Feb.	20	Fannettsburg, Fort Loudon, PA, local and ISAC. Contact Terry Keefer (717) 349-2262 or tkeefer@cvn.net
March	6	Finger Freezing ISAC, Ligonier, PA. Contact Chuck Butorajac (724) 238-6878.
March	20	Fannettsburg, Fort Loudon, PA, local and ISAC. Contact Terry Keefer (717) 349-2262 or tkeefer@cvn.net
April	3-4	Second Annual April Fool's Atlatl Throw, Arvada, CO. Contact Charlie Brown (303) 421-0035 or sazi@prodigy.net
April	10	Give Me a Brake ISAC, Ligonier, PA. Contact Chuck Butorajac (724) 238-6878.
April	16-19	Ninth Annual Atlatl Contest at Valley of Fire State Park, Overton, Nevada. Contact Leni Clubb (760)358-7835or leniwaa@inreach.com
May	1	Annual Idaho State Open Atlatl Competition (held in conjunction with Idaho Archaeology Week) at Celebrtation Park near Melba, ID. Contact Tom Bicak (202) 495-2745, or Dean Pritchard (208) 323-0293 or atlatl@micron.net
May	1	Second Annual Gathering of Atlatlists, Turbotville, PA, Local and ISAC. Contact Gary Fogelman (570) 437-3698
May	1-2	Indian Creek Archery (and Atlatl) rendezvous, Pawhuska, OK. Contact Dale or Norma Pinney (918) 287-4585 for rendezvous information, and Ray Madden (417) 781-0962 for atlatl events.
May	8	Edge of Cedars State Park Atlatl Contest, (Utah Prehistory Week) Blanding, UT. Contact Deborah Stevenson (435) 678-2238 or dstevenson1@hotmail.com or Leni Clubb (760) 358-7835 or leniwaa@inreach.com
May	14-15	Fort Osage Knap-in and Atlatl Competition, Fort Osage National Historic Landmark, MO. Contact Ron Mertz (314) 822-2514.
May	21-23	No Name Rendezvous at Ahlman's 2 miles north Morristown, MN. Contact Skip Edwards (507) 625-3352 or Jerry Schaefer (507) 243-3300.
May	29	Pennsylvania Spring Fling ISAC, Ligonier, PA. Contact Chuck Butorajac (724) 238-6878.
May	29	Mastodon State Park, Jefferson County, MO. Atlatl and other primitive events with ISAC. Contact Ron Mertz (314) 822-2514.
June	18-20	Fremont Indian State Park Annual Atlatl Contest and ISAC, Sat. the 19th, Sevier, UT. Contact Pete Weimer (435) 527-4631.
Jun.	26-27	European Championship plus ISAC, Lago della montagna spaccata (Broken Mountains Lake) Abruzzo national Park, Italy, Contact Bruno Morucci or Pascal Chauvaux.
July	9-10	Aurora Spear Sling Fling Thing, Aurora History Museum, Aurora, Colorado. Contact Bill Tate (303) 755-5591 or atlatl@mho.net.
July	10-11	Keefer Klan Atlatl Competition, Fannettsburg, Fort Loudon, PA. Contact Sharon Keefer (717) 349-2262 or tkeefer@cvn.net
July	17-18	Montana Mammoth Hunt Contact
July	17	Alder Acres Atlatl Tournament, Lorraine, NY. Contact Rodger Klindt (315) 639-6293 or mammothdoc@juno.com
July	24-25	French Creek Artifact Show and Atlatl Tournament, Saegerstown, PA. Local and ISACs. Contact Gary Fogelman (570) 437-3698
Aug.	28-29	Stone Tool Technology Show, Letchworth State Park, Castile, NY. Contact Bob Berg (607) 687-4064.
Aug.	28-29	Ahlman's Shooters Round-up at Ahlman's 2 miles north of Morristown, MN – Note, Big Red will be there. Contact Dale Torma (218) 865-7049.
Sep.	11-12	World Atlatl Association 12th Annual Meeting and Atlatl Contests, Cahokia Mounds State Historic Site, Collinsville, IL. Contact Ron Mertz (314) 822-2514.
Sep.	18-19	Pennsylvania Championship and Deer Hunt, Naugle's Game Farm 1½ miles east of Rt. 219 on Rt. 30. Contact Chuck Butorajac (724) 238-6878.

*Note, our contact for all Europoean Spearthrowing Championship contests is Pascal Chauvaux, Rue Au dela de l'Eau, 3 B-5630, Cerfontaine, Belgium – Telephone: (32) 71 64 34 16 or atlatl@skynet.be

Please send us dates of atlatl events for inclusion here, and keep submitting your reports, cartoons, and suggestions to us. Your editor can be reached by FAX at (303) 755-1145, or mail at 1390 S. Paris Court, Aurora, CO 80012, phone (303) 755-5591, or by e-mail: atlatl@mho.net

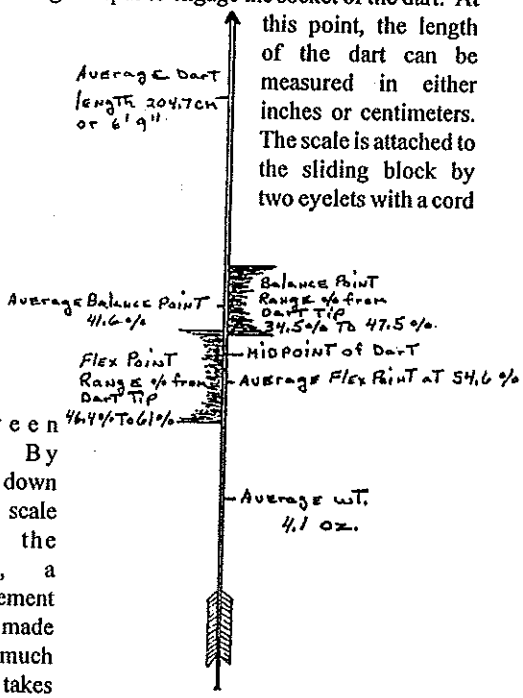
We regret any errors in the listing for Events Around The World, but occasionally we receive wrong or confusing information and sometimes we just plain make mistakes. Please help out your poor old editor, and proof-read submissions. Make sure that the event's date coincides with the days indicated, that you name the competition or event and include the location where people can find you. Give a good phone number and the event's contact person's name. If what you are submitting is a correction, please so state. Everyone will be happier if you follow these instructions.

The Spine Tester

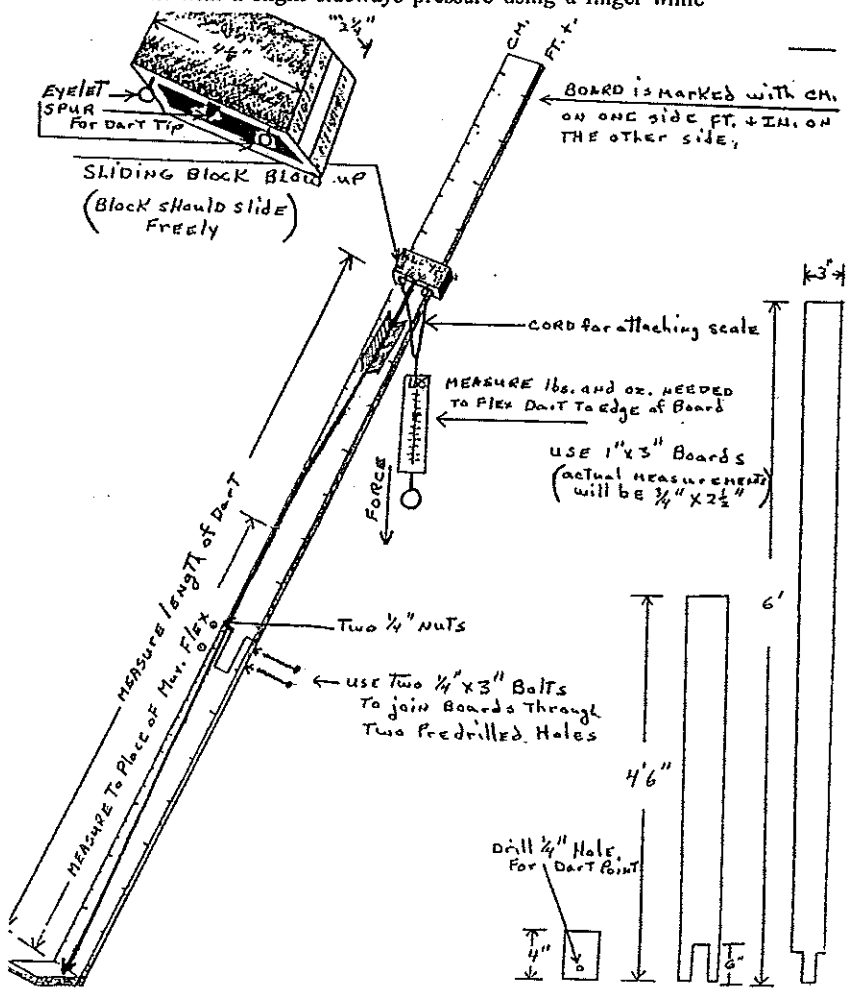
by Richard B. Lyons

The spine tester is easy to make and requires only hand tools. Materials required are two 6 foot 1X3s, two 1/4 inch bolts with nuts, two eyelets and one fish or other type hanging scale. The 6 foot 1X3 boards will be sufficient to make a 10 inch spine tester and the sliding block to which the scale is attached. The spine tester can be marked in feet and inches on one side and centimeters on the other to facilitate measuring the length of the darts and point of maximum flex.

The spine is tested by attaching a hanging type scale to the eyelets of the sliding block. The sliding block should be equipped with a spur for attaching the dart. The dart is placed on the spine tester with the point set in a 1/4 inch deep hole in the perpendicular 1X3 board at its base. The sliding block is brought down from the top allowing the spur to engage the socket of the dart. At this point, the length of the dart can be measured in either inches or centimeters. The scale is attached to the sliding block by two eyelets with a cord between them By pulling down on the scale using the cord, a measurement can be made of how much force it takes to make the dart flex a certain distance. I suggest measuring the force needed to flex the dart to the edge of the board. At this stage, the location of maximum flex of the dart, can be measured from the tip or point. An example might be of a dart which is 210 cm long which takes 5 lb. 2 oz. to flex to the edge of the board, and the location of maximum flex is 163 cm. from the dart's tip.



Now, a paradox develops in testing the spine of darts by compressing them along their lengths. A perfectly straight dart, when compressed in this manor, will not flex at all. It will compress to the point at which it shatters. Of course, there are few, if any, perfectly straight darts. Still, the straighter a dart is the more force is required to get it to flex. However, we want to measure flex, not degree of straightness. This problem can be overcome by initiating the flex with a slight sideways pressure using a finger while



HOW DO YOU MEASURE UP?

The above spine tester was employed to measure and compare favorite darts of eighteen WAA members at recent competitions. The following tables include descriptive details about their atlatls as well as their darts.

Name	Dart Length cm.	Weight Oz.	Diameter mm	Material	Foreshaft Employed	Point Material	Balance Pt cm/%	Fletching No.	Fletching Length X Width	Spine Weight Lb.	Spine Weight Oz.	Max Flex cm/%
V. Aheame	198	3	9	glass	yes	steel	76/38	4	12X2.5 cm	3	12	92/46
M. Petrucha	186	3	9	glass	yes	steel	72/39	4	12X2.5 cm	4	5	105/56
L. Becker	209	3	9	glass	yes	steel	92/44	3	15X2 cm	3	8	113/54
J. Whittaker	184	5	13	maple	no	steel	84/46	4	16X2 cm	6	9	106/58
R. Madden	148	1.5	9	cane	yes	wood	58/39	3	4.5X1 cm	2	9	70/47
J. Gilligan	183	3	9	glass	yes	steel	73/40	3	11X2 cm	4	13	101/55
M. Bracken	217	5.25	13	cane	no	copper	75/35	4	22X2 cm	7	11	125/58
R. Mertz	215	4.5	10	dowel	yes	brass	91/42	3	11X2 cm	4		125/58
C. Butorajac	213	3.75	13	cane	yes	wood	90/42	3	28X2.5 cm	5	15	130/61
R. Lyons	203	3.5	10	aluminum	no	steel	79/39	4	22X2 cm	5	5	110/54
M. Strischek	198	4.5	10	aluminum	no	steel	74/37	3	12.5X2.5cm	4	10	106/54
B. Tate	186	4.5	11	glass	yes	steel	88/47	4	12X1 cm	8		102/55
R. Strischek	230	5	13	cane	yes	copper	103/45	3	23X4.5 cm	8	7	133/58

B. Berg	246	6	14	spruce	no	metal ?	115/47	4	28X3 cm	5	10	120/49
C. Pappas	220	3	11	cane	yes	bone	86/39	3	15X2.5 cm	5	10	122/55
G. Fogelman	225	5	13	hemlock	no	wood	107/48	3	24X3 cm	3	12	124/55
T. Keefer	206	4.5	13	cane	yes	copper	86/42	4	21.5X2.5cm	9	5	115/56
D. Bard	218	5.5	16	cane	yes	copper	90/41	4	23X3 cm	9	12	120/55
Averages	**204.72**	**4.08**	**11.39**				**41.67%**			**5**	**12**	**54.67%**

ATLATL MEASUREMENTS

Name	Length cm.	Weight Ounces	Grip Style	Employs Atlatl Weight	Rigid or Flexible	Made From	Spur Type
V. Ahearne	60	6.75	Basketmaker	yes	F	Babinga wood	Male
M. Petrucha	60	7.5	Basketmaker	yes	F	Cherry	Male
L. Becker	63	6.25	Basketmaker	yes	R	Red oak	Male
J. Whittaker	65	7.25	Basketmaker	yes	F	Maple	Male
R. Madden	61	4.75	Center hole	yes	F	Gambrel oak	Male
J. Gilligan	61	5.5	Basketmaker	yes	F	Black locust	Male
M. Bracken	66	10	Unique (loop)	yes	F	Hickory	Male
R. Mertz	63	7.25	Hammer	yes	F	Osage orange	Male
C. Burorajac	62	14.5	Unique (Bmkr)	yes	F	Hickory	Male
R. Lyons	63	13	Basketmaker	yes	F	Osage orange	Male
M. Strischek	61	6.5	Basketmaker	no	F	Wood ?	Male
B. Tate	64	4	Basketmaker	no	F	Ash	Male
R. Strischek	60	9	Basketmaker	yes	F+	Purple heartwood	Male
B. Berg	74	4	Hammer	no	F	Maple	Male
C. Pappas	69	8.5	Javelin	yes	F	Osage orange	Male
G. Fogelman	64	8	Basketmaker	yes	F	Wood ?	Male
T. Keefer	56	10	Javelin	yes	F	Osage orange	Male
D. Bard	57	9.75	Hammer	yes	F	Walnut	Male
Averages	**62.72 cm**	**7.92 oz.**					

ATLATL SPURS

By Ray Strischek

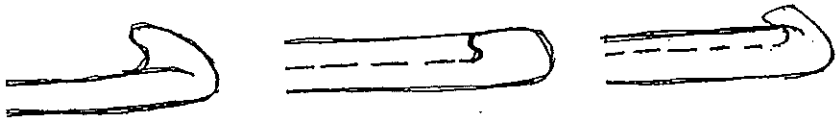
I was 1997's International Standard Accuracy Competition (ISAC) champion, but have no "natural" throwing ability. I have never been able to develop the kind of consistency and control that I have witnessed in others competing in the ISAC. The advantage I enjoyed in 1997 came from a spending a great deal of time studying information gathered by others on the basic design elements of a good dart, the utility of flexible atlatls, and the practical function of atlatl weights. In the process of designing my atlatl I ended up making a bunch of different atlatl spurs, primarily because I can never seem to make the same thing twice. Out on the practice field, I noticed that different spur designs had different effects on the flight of the dart.

Some of the effects were disastrous. Some spurs had the effect of dampening, or causing a vibration to occur in the flexing of the dart during the casting motion, or causing an initial lift in the point end of the dart during the first moments of the casting motion, while other spurs had no such effect at all. Some tended to push the point end of the dart down below the rear end of the dart just at the moment when the dart separates from the atlatl.

After a while, I began to see a repetition of cause and effect with certain design elements of the spurs. Eventually I stopped trying to make it pretty, and started exploring spur function when it became obvious to me that this could effect accuracy.

The spur is the thing on the distal end of the atlatl, which fits, however briefly, into the hole or cup in the butt end of the dart. Spurs can be made of bone, horn, antler, stone, metal, and even be a carved portion of the atlatl itself.

There are three basic classifications of spurs: male, female, and neutral. (See below.) In the archaeological record, there are very many variations of the above themes. In the four years that I have been attending atlatl contests, the spurs I have seen used are more creative or artistic in expression than they are copies of any spurs found in the archaeological record.



MALE FEMALE NEUTRAL

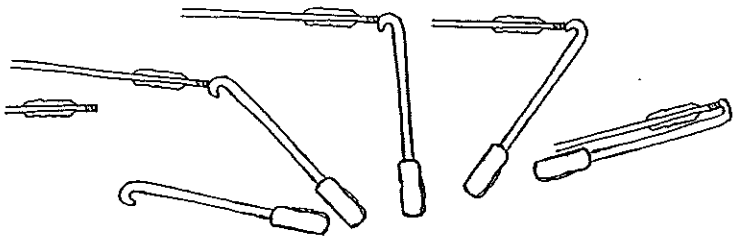
BASIC SPUR FUNCTION:

1. The tip of the atlatl spur is actually only inside the dart's cup prior to the cast. As the casting motion

begins, the spur tip should freely rotate inside of and exit the cup. Any design flaw that prohibits the spur tip from rotating into and out of the dart's cup will have a bad effect on the dart's flight.

2. During the remainder of the casting motion, the dart is only nominally connected to the top of the spur by the simple fact that the atlatl is moving faster than the dart.

3. And, during this same remainder of the casting motion, the rear end of the dart is actually sliding along the top surface of the spur, as the spur continues to rotate through the casting motion. Obviously, any design flaw in the top surface of the spur will have an effect on the dart's flight.



From right to left, the casting motion. Note how the dart disengages from the tip of the spur and slides along the top surface of the spur until the casting motion reaches a certain point at which time the dart separates from the atlatl.

SOME OBSERVED COINCIDENCES:

1. The design of the spur can lengthen or shorten the amount of time the dart remains in contact with the spur during the casting motion. For those of you who like to fully extend your throwing arm towards the target in its follow through, as a means of controlling the dart's direction, lengthening the amount of time the dart remains in contact with the spur is quite useful.

2. The top surface of the atlatl spur is a kind of a runway for the dart butt. A surface that is a flat plane rather than a curved plane will likely cause the dart to remain in full contact for a longer period of time.

3. Viewing the atlatl from a side view, if the rear end of the atlatl is curved up, the casting motion will tend to drive the point end of the dart down during the last moments of the casting motion. The opposite is true if the rear of the atlatl is curved down.

4. The dart butt is round, and if the spur is cone or tube shaped, only a very small amount of one edge of the dart butt will stay in contact with the spur during the casting motion, especially if the spur is a curved claw shape. Think about that.

SPURS AT AN ANGLE TO THE ATLATL SHAFT VERSUS SPURS PARALLEL TO THE ATLATL SHAFT:

The good news:

1. Spurs which are at an angle to the atlatl shaft (male) tend to provide a bit of initial lift to the point end of the dart.

2. Spurs which are parallel to the atlatl shaft (female) provide relatively no initial lift to the point end of the dart.

3. Neutral spurs can swing either way, behaving more like a male spur if the atlatl shaft is curved down at the spur end.

If you want to get an initial point end lift from a parallel spur, you can curve the spur end of the atlatl down. If you want to decrease the amount of initial point end lift gained from an angled spur, you can curve the spur end of the atlatl up.

I am unsure why or how angled spurs provide front end lift whereas parallel spurs do not. I have experimented with straight atlatls, curved up atlatls, curved down atlatls with both angled and parallel spurs. And, I have observed the differences each has caused in the flight of the same dart, thrown at the same target, from the same distance, and with the same force of throw. I have used the knowledge gained to my advantage, to the effect that I prefer angled spurs for use on targets that are up off the ground, i.e., ISAC targets, and prefer parallel spurs for small targets that sit on the ground, such milk cartons. Consider this as you read on.

The bad news:

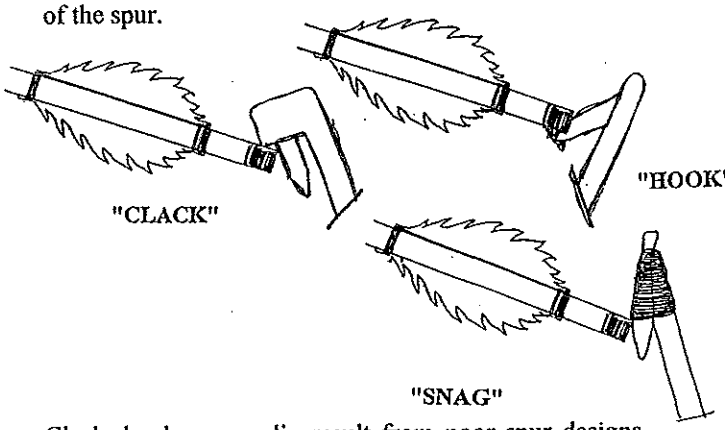
Atlatls which have some atlatl shaft beyond the rear end of the spur tend to beat down on the butt end of the dart at the moment of dart atlatl separation. This is generally accompanied by a loud "clack" noise. Spurs which have lashing on the top side of the spur tend to snag the butt end of the dart during dart/atlatl separation. The one exception to this snag problem is the design of Bob Berg's atlatls. His tines are set at a 45 degree angle to the atlatl shaft, and the dart separates from the atlatl long before the dart butt has a chance to slide into the lashing.

In the archaeological record, there is an atlatl from the American Southwest that has a spur lashed to it with sinew wrapping over the top surface of the spur. Interestingly, the spur is a male type and is angled about 30 degrees relative to the otherwise straight atlatl shaft. Further, the lashing is down low to the rear of the spur leaving about one inch of spur top runway clear over which the dart butt can slide unobstructed.

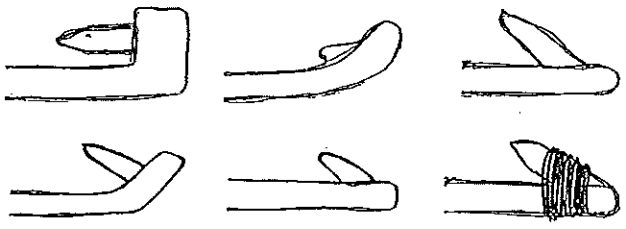
Spurs which have a really sharp point or shovel or duck bill-shaped spur tip tend to wedge into the sides of the dart butt's cup, or "hook" on to the lower lip of the cup. This causes the dart to lose some flexibility and sometimes creats a quite obvious vibration that tends to dampen the flex and reflex action of the dart after it separates from the atlatl. Such "hooking" can even split open the rear end of river cane darts and dent the butt end of aluminum darts. For hard wood darts, this damage is not much of a problem, but with any dart, "hooking" can cause a real problem with accuracy.

Do not confuse the above "hooking" with what happens when an atlatlist casts "off the shoulder," or slightly "sidearms" a cast. When a person thus "hooks" a shot, the dart will curve off to the left or right. In this sense, "hooking" is a bad choice of words since what has really happened is that the person has pushed the rear end of the dart off to one side or the other.

During nearly the entire casting motion, when the dart butt is sliding along the top surface of the spur, only a very small portion of the edge of the circular rim of the dart butt is pressing against the surface of a spur that is cone-shaped. The chances that the dart will slip off one side or the other of a cone-shaped spur are pretty high. This slipping can be reduced by flattening the top surface of the spur.



Clack, hook, snag, slip result from poor spur designs. None will cause a missfire every time, but it happens often enough in competition to ruin an otherwise good day.



Above are some spur designs likely to cause clacking, hooking, and snagging.

SHOULD I HAVE INITIAL POINT END LIFT OR NOT?

Think shotgun. Up to a certain distance, the shotgun can be aimed directly at the target. Beyond that distance, estimation, of the appropriate elevation of the barrel of the shotgun above the target is required. Obviously, aiming directly at a target is more conducive to accuracy than having to factor in elevation along with direction. Those of you who have participated in the European style atlatl contests which require throwing distances of from 8 to 26 meters, have probably discovered that targets at distances under 12 meters are as difficult to hit as targets at distances over 20 meters. At the shorter distances, it seems under elevation of aim, choke-up, or abbreviated casting motion is required, while at the longer distances greater force of throw and/or higher aiming elevation is required. In the ISAC, even the 5 meter difference between the 15 and 20 meter targets seems to require more force of throw, and/or elevation of the dart point above horizontal. Obviously, if the atlatl and dart can be aimed more like a rifle or bow and arrow, directly at the target, or at least using some point within the confines of the target for a reference point, rather than having to aim the thing like a catapult with lots of elevation "guess-t-mation" and "Kentucky windage" thrown in, consistent accuracy is likely to be more obtainable.

A spur which is at an angle to the atlatl shaft provides a point end lift during a horizontal cast. At the same throwing distances an atlatl with a horizontal spur would have to have the point end of the dart elevated prior to the cast. In my experiments with spurs, the difference accounts for about half a meter of altitude at 15 meters from the target. This means that at 15 meters, using an angled spur and aiming horizontally at the bulls eye of an ISAC target, my dart would hit the 6 ring above the bulls eye, while using a horizontal spur design, the dart would hit the bottom of the bulls eye. At issue here is which spur design will allow me to aim and cast within the confines of the target rather than aiming and casting at some imaginary point above it.

AT LONGER DISTANCES, WHY CAN'T I JUST THROW HARDER AND NOT HAVE TO WORRY ABOUT ELEVATION OF THE POINT END OF THE DART?

The most sensitive part of the atlatl and dart system is the dart's range of flexibility and degree of kinetic flexibility. Nothing effects that sensitivity quite like changes in force of throw. And, nothing undergoes quite as many changes during the course of a long drawn-out

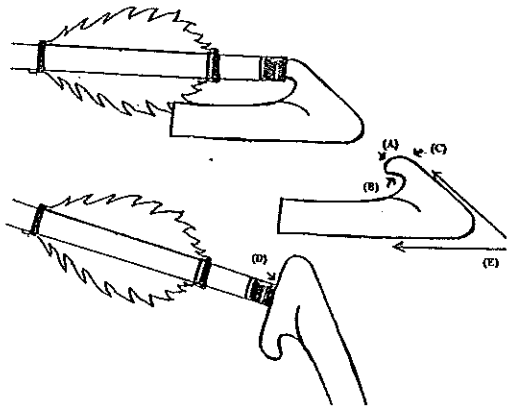
competition than your arm's muscles and consequently, your ability to gauge and control that subtle, necessary amount of change in force of throw from one distance to another. Throwing harder causes the dart to flex and reflex faster and wilder, generating obvious control problems directly related to accuracy. For the ISAC, with its 15 and 20 meter ranges, I find it easier to maintain consistency by simply adding a little more point end elevation at 20 meters. At 15 meters, I simply aimed horizontally at the bottom of the bulls eye, and at 20 meters, using just a couple of inches of point end elevation, aimed at the 6 ring directly above the bulls eye. I used the same force of throw at both distances..I used an angled spur, as a parallel spur at 20 meters would have forced me to aim at some invisible point above the target, substituting lobbing for throwing.

WITH YOUR PARTICULAR ATLATL AND DART, THE QUESTIONS TO ASK YOURSELF ARE:

1. At what distance from the target can I aim the atlatl and dart more or less like a rifle, seemingly directly at the target, and cast a dart that travels parallel to the ground with little or no arc, with little or no drop, straight to the center of the target?
2. At what distance beyond horizontal aiming do I begin to employ how much more force of throw and/or exactly how much elevation of the dart's point end prior to the cast to get to the same spot on the target?
3. Which spur type or design will best help me aim within the confines of the target, rather than having to employ some imaginary reference point above and outside the confines of the target?

Note that beyond 20 meters, all is pretty much elevation guesswork for which the only cure is a heavy investment of practice. For long distances, I don't think any change in design will permit aiming within the confines of the target. But with the short distances used in ISAC, good spur design can eliminate a lot of guesswork.

Only experimentation while thinking about the problem will provide you with the answers. What I have tried to do in this paper is to point out some common spur design flaws which can be avoided. If you don't have to worry about your spur hooking, snagging, or clacking, or about your dart slipping off to one side of the spur, you can put all of your thinking into more important concerns. If you copy closely any one of the three classic spur types shown in the beginning of this paper, you should have no problem. Below is a spur design of my own which I have discovered by trial and error, works quite well.



A. The tip of the spur is bulb-shaped (ball and socket), which allows the tip to smoothly rotate into and out of the cup at the rear of the dart. Care should be taken to make sure the cup size in the dart is compatible with the size of the spur's bulb.

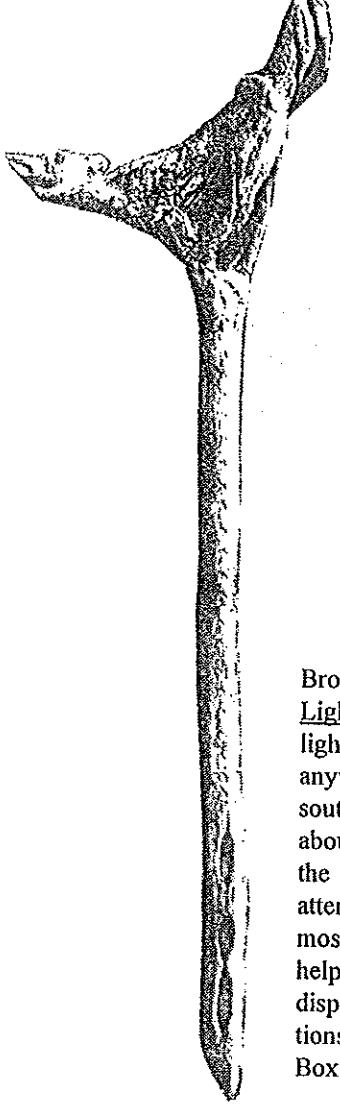
B. The bottom of the bulb is somewhat flat which catches just enough of the lip of the dart's cup to keep the dart from slipping off the spur prior to the cast. For those of you who use the grip style that requires the dart to be pushed rearward onto the spur and held in place by the thumb and finger prior to the cast, this flat bottom on the spur will allow you to simply rest the dart between your thumb and finger, eliminating that nasty tendency to grip the dart too hard or too long as the cast begins.

C. Behind the bulb, the spur widens quickly, causing the spur tip to disengage from the dart cup as soon as the casting motion begins so that the flat underside of the bulb does not have a chance to hook the dart.

D. The top surface of the spur behind the bulb is somewhat flat, not cone or tube shaped, so that the dart does not slip off one side of the spur or the other.

E. The angle of the spur to the atlatl shaft is about 30 degrees which provides initial point end lift for the dart. The length of the flat plane of the top surface of the dart, as well as the angle of the spur itself, is just right for lengthening the amount of time the dart remains in contact with the spur to allow me to fully extend my arm toward the target before the dart separates from the atlatl.

My intention here is not to carve anything in stone about atlatl spur design. Everyone's casting techniques and equipment being different, there is plenty of room for many perfect spur types. All I have tried to do is get people thinking about the function of the design of the spur and how such things effect accuracy. In 1998, American atlatlists made significant gains in their ISAC scores, primarily because they took a keen interest in their dart designs and made improvements. I am certain that still further gains can be made if atlatlists put some thinking into their spur designs. (Cont'd.)



This unintended side trip of mine into the function of atlatl spurs has rekindled my interest in the variety of atlatl designs in the archaeological record. It is impossible to ignore the reports that different spur types appear together at many sites. That fact, and my limited experimentation, leads me to believe that there may have been specified target-related, functional purposes for these different spur types found there together, and not just some accidental random re-invention or thoughtless experimentation. I am not a scholar, but someone who is, might want to look into that.

ATTENTION COMPETITION ORGANIZERS

Don't forget President Charlie Brown's request for donations to the Museum Lighting Fund. This fund is going to bring better lighting to the greatest display of spearthrowers anywhere. Located in Ariege Pyrenees in southern France, the Musee le Mas d'Azil houses about 18 spearthrowers and fragments including the one at left, which captures everyone's attention -- the one Pascal Chauvaux calls the most beautiful spearthrower in the world. Let's help provide badly needed illumination for their display. Give 'til it feels good! Send contributions to WAA Treasurer, Heidi Daetwyler, PO Box 1633, Dillon, CO 80435.

Plan your vacations now to meet at Cahokia Mounds State Historic Site, Collinsville, IL September 11 and 12 for the Annual Meeting of WAA and one of the great atlatl tournaments in the country.

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The next issue will include Europe's full schedule for 1999 and a paper on whale bone dart-throwers from Washington and Oregon by Lorenz Bruchert. Also included will be registration sheets for Valley of Fire State Park, Nevada for April 16-19, and Fremont Indian State Park, Utah June 18-20. Both big competitions will have special events, camping, and Dutch Oven dinners. Watch for the April 1999 *The Atlatl*.

MEMBERSHIP IN THE WORLD ATLATL ASSOCIATION IS JUST $10.00 PER YEAR, FAMILY: $15.00. CANADIAN AND FOREIGN MEMBERSHIPS: $12.00. SEND ALL INQUIRIES AND DUES TO WAA SECRETARY.

LENI CLUBB
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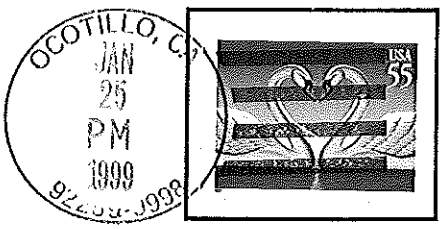

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