



Flight Characteristics of Javelin

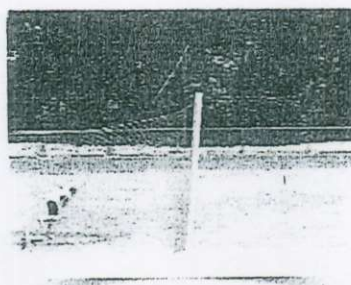
Duncan Attwood



1. What's the Problem?

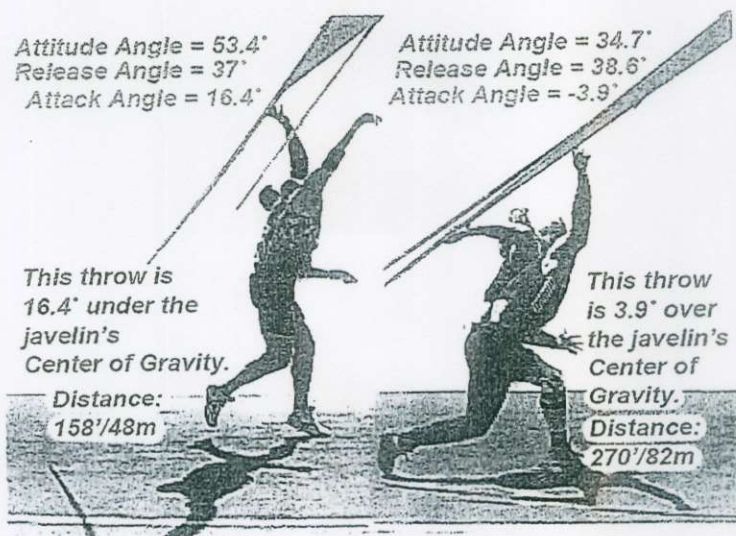
A. New Rules javelin self-corrects. This can make it hard for coaches and athletes to see when there is too much angle of attack. Old Rules javelin was easy to see. I will explain how the New Rules javelin's bigger tail makes for more lift, which works to make the javelin turn over sooner for a good flight and how it self-corrects for a bad one.

Here I will show a video of a self-correcting flight. I use the Ubersense app to do on-screen graphics to make it easy to see.



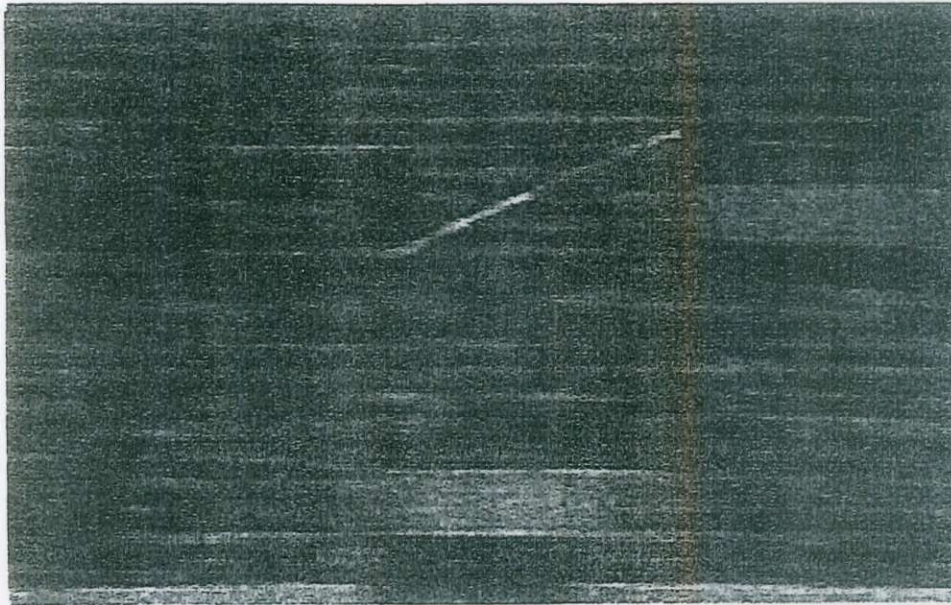
B. USATF biomechanics reports often show athletes losing up to 5m because of too high angle of attack. This might be true in many countries. Most coaches don't know that there can be so much loss from a high attack angle.

Here will be pages and pictures from these reports. I will explain release angle, attitude angle, and attack angles.



3. Old Rules javelins. Advantages: Easy to see good flights from bad. Strong.

Here I will show comparison video of two Old Rules flights, different but both over 90m.



Disadvantages: Very hard to find now. Flight characteristics maybe too different from New Rules. Many Old Rules javelins are now worn and not balanced well

3. How to Have a Good Flight Training Practice

A. Throw into any wind. This makes the flight easy to see. 1-4m/sec is best.

B. Make easy throws that "float", not hard throws. Put a mark at the landing point, then:

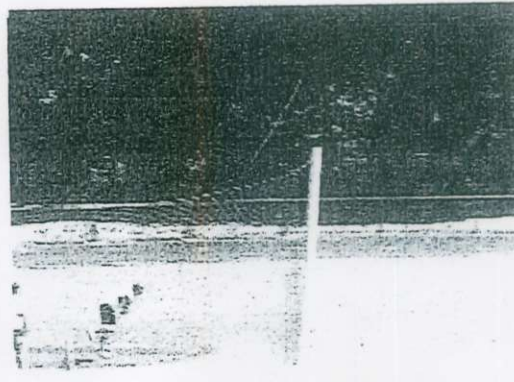
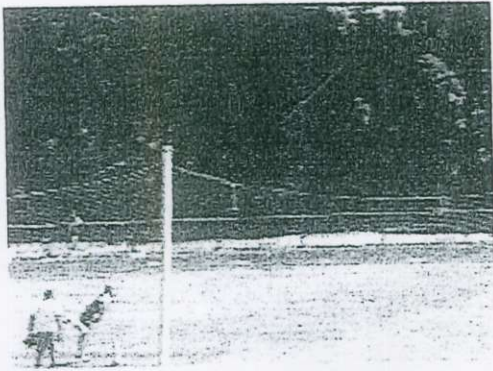
C. Beat the mark BY FLYING THE JAVELIN, not by throwing harder. It will be obvious to the athlete that very clean flights give the most distance for the power.

4. Other Considerations

If the coach and athlete can see the slowing effects of a high attack angle throw, and the athlete can control their attack angle, then simply experimenting with different attack and inclination angles can show everyone what works best. No need for a flight-sensitive javelin.

But most men @70m and below and women @55m and below need to develop their flight skills and will benefit from throwing light weight, flight sensitive implements.

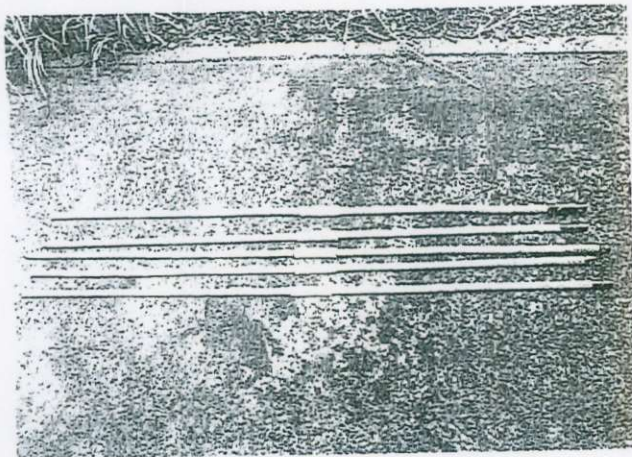
C. High angle of attack causes drag, slows the javelin flight. Better to throw with no angle of attack or slight negative angle. I will tell about how reports and interviews show 33-40 degrees are good inclination angles, and how -3 degrees is good for an attack angle. Here will be pictures like this, and video clips comparing good flights with bad ones.



2. What's the Answer?

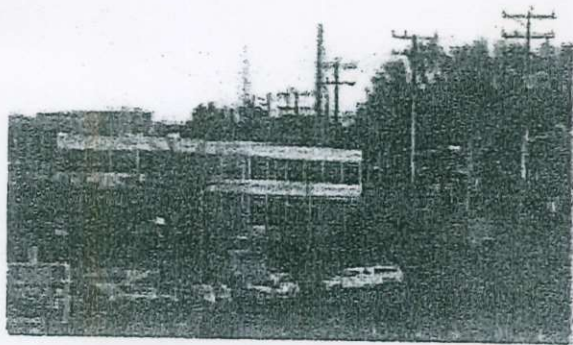
A. Athletes should throw implements that make it easy to see when they have a good throw.

1. Bamboo or similar. Advantages: A good piece of bamboo will fly very well, and it's cheap. Disadvantages: Hard to find a really good piece. Inconsistent quality. They break. Here I will include this picture and video clips of how the bamboo javelin flies. I will make a short discussion of how to build a bamboo javelin.





2. A plastic training javelin, like the Finnjav. Advantages: Consistent, strong, accurate flight behavior. Disadvantages: Not so cheap.



Here I will show this picture and video clips of how the Finnjav flies, and how athletes learn from throw to throw.