

## Two years with the New Javelin

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“ In this second article on the new men's javelin, the author describes briefly the tests and the experiments carried out by Swedish coaches and athletes in an effort to adapt the training content to the characteristics of the new implement. ”

Almost two years ago, on April 1, 1986, the new rules concerning the Men's Javelin came into force. Before this change of rules, there were a number of discussions among athletes, coaches and other people, who, in one way or another, were involved in javelin throwing. Quite a number of negative opinions were expressed, but never the less, all of us had to face the decision taken by the IAAF at their Congress in Los Angeles 1984.

The two main differences in the rules were:

- the centre of gravity was moved forward;
- the rear part of the javelin was made thicker.

These two things changed the aerodynamics of the javelin. Together they bring the centre of pressure at different angles of attack backwards to behind the centre of gravity. Because of this, the javelin would no longer be able to “fly”. It would have a much more stable flight and land very distinctly tip first.

Coaches and athletes tried, together with biomechanists and other specialists, to figure out the consequences on technique and training. Some, very common, opinions that were put forward said that this new rule most

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## THE NEW JAVELIN

	JAVAGUN *		TOP-THROWERS **	
	Whithout rotations $V_0$ : 27,8 m/sec	Whith rotations 21,5/sec $V_0$ : 28,3 m/sec		
OLD	82,18	84,60	86,25	
NEW	78,74	79,58	79,30	80,00
DIFFERENCE	4,2 %	5,9 %	8,1 %	7,3 %

\* Average of 300 shots with the javagun. Models from NORDIC, HELD and APOLLO

\*\* Average of athletes ranked 21 - 50 in the Worldlist from 1985 (old), 1986 (new) and 1987 (new).

COEFFICIENT OF CORRELATION; THROWINGDISTANCE AND SPEED OF RELEASE ( $V_0$ ).

OLD  $r. + 0,90 - + 0,97$  (Ikegami, Miura, Matsui & Hashimoto/1981; Terauds /1978; Komi & Mero/1985)

NEW  $R. + 0,80 - + 0,87$  (Borgström & Almström /1986)

probably would lead to bigger and stronger javelin throwers and that the demands of technique would be less. In Sweden we had the big advantage of having Nordic Sport, producer of the famous Sandvik javelins, in our country. This meant that we had good opportunities to follow – and influence – the development of new models.

We were also supplied with tests models.

During the autumn of 1984 and all of 1985, we tried to get used to the new javelin. Testing it in the javagun consequently showed less difference from the old javelin than the difference made by throwers. From this, we should have been able to draw some conclusions...

Anyway, in Sweden we accepted the theory "bigger" – "stronger" – "decrease of technical demand" and therefore, we put more emphasis in developing the physical capacity of the thrower than developing the throwing technique. I must say, that as early as the spring of 1986 we saw how wrong this was. The new javelin was actually more sensitive to technical errors than the old one. We should have been able to predict this, but, I must admit, we had been blinded a little bit by the international debate!

Why should it have been possible to make these conclusions earlier? Let us put some details on record:

— In October 1985, Nordic Sport was visited by a group of excellent coaches and throwers from GDR. Some throws of Uwe Hohn were filmed at 1000 frames/sec. with a high speed camera from Kodak. When analysing these throws we found that Hohn reached a release velocity of over 31m/sec. but the javelin was flying less than 78 meters... Further analysis

showed that Hohn didn't "hit the point" on these throws. During the throw he introduced oscillations of great importance into the javelin. These oscillations seemed to have an even bigger influence on the new javelin than on the old one. The loss of speed during the first meters of the flight was quite considerable!

— The fact that the difference in throwings distances were smaller with the javagun compared with throwers gave a clear hint of increased technical demands. Shots with the javagun gave no oscillations and were made with no angle of attack and the force put into the javelin was linear. These observations have been pretty well confirmed by the first two years with the new javelin.

— Some research findings on the correlation between speed of release and throwing distance gave the same indications. With the old javelin we can look at the results given by Ikegami, Miura, Matsui & Hashimoto (1981), Terauds (1978) and Komi & Mero (1985), all giving coefficient of correlation between  $r. + 0,90$  to  $+ 0,97$ .

With the new javelin, Borgström & Almström (1986) found corresponding values of  $r. + 0,80$  to  $+ 0,87$ .

These results don't prove, but they certainly indicate, that the demands of technique with the new javelin probably have increased compared with the already high demands of the old javelin!

The speed of release is still the most important biomechanical detail of the javelins throw. But it is also of extreme importance that the thrower gives as few oscillations to the javelin as possible and that the flight is as undisturbed as possible by "misforces". Therefore a consequence in the

training should be that coaches and athletes should give more attention in developing technique up to a very high level.

I do not think that this change of rules influences the training in general in a strong way. The big advances are to be found by improving technique. The development of methods of training is always moving on and javelin throwing is no exception. But these advances are more related to the general development of training than the new rules.

Some of the thoughts among Swedish javelin coaches and athletes can be expressed by the following

keywords:

- high intensity
- very special speed strength
- a lot of throwing
- variations in small ranges
- complex training sessions
- balance between load and rest

The mistakes that we made during 1985 and spring 1986 are still a little bit heavy to bear. However, we are most certainly aware of this situation and we will try extremely hard to find new ways in accomplishing the technique, knowing that the only way to success is hard, determined work!

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