This instalment of the Round Table is the second half of the discussion recorded at the NSA Advisory Editorial Board meeting in May 1989 in Cologne. The first part was presented in NSA no. 3, Vol. Four. This part of the session covered the Practical Theme of this issue, the Vertical Jumps. The Advisory Editorial Board members who took part in the discussion were Jim Alford (GBR), Li Chengzhi (PRC), Kenneth Dyer (AUS), Vern Gambetta (USA), Victor Lopez (PUR), Tom MacWilliam (CAN) and Juris Terauds (CAN) and Executive Editorial Board member Helmar Hommel (FRG).

1. What are the qualities that you would look for in a high jumper and a pole vaulter respectively?

GAMBETTA
For a high jumper I would say jumping ability, a naturally, high standing centre of mass, explosiveness, and otherwise basically the same qualities test wise you would look for in the horizontal jumps. In the pole vault, courage, speed, strength, gymnastic ability, and a good insurance policy are needed.

LOPEZ
For a high jumper, speed relative to the event, which is needed for conversion to vertical velocity, a high centre of mass and good coordination of flexibility. A pole vaulter needs strength and the psychological capacity to overcome fear and adversities.

LI
The high jumper needs strength but also a relatively light body weight.

ALFORD
In a high jumper I would look for strength, elastic rather than pure strength, a light body weight and a high centre of gravity. In a pole vaulter the important
1. What are the qualities that you would look for in a high jumper and a pole vaulter respectively?

things are guts, determination, speed, suppleness, strength, especially around the shoulders, gymnastic ability and the ability to stick at it, as it takes a long time to learn the event.

MACWILLIAM

I don't think I could add much to what has been said about high jumpers. I would like to emphasise that for a vaulter flexibility, upper body strength, gymnastic ability, speed plus, a little bit of insanity, not in the clinical sense, or a craziness beyond guts are all required.

TERAUDS

For the high jump you need a high centre of mass, relatively long limbs, vertical jumping ability, as in a sargent jump, and a high weight to strength ratio. For the pole vault I think you have to start off with daring, the ability to perform with reckless abandon, speed, gymnastic ability, a high strength to weight ratio and, in particular, strength in the upper body, so that the athlete can actually do work while on the pole.

DYER

I don't have anything to add really. It just seem to me that a pole vaulter is a bit different. I mean strength, speed and coordination are common requirements for most athletic events, but courage and gymnastic ability are things that aren't required elsewhere.

ALFORD

One thing that has been mentioned, the sargent jump test, is not very reliable for high jumpers. I've found that my throwers do much better than high jumpers off two feet. Very often high jumpers are not all that good at it. What is important is the difference between what they do off a two foot take-off and what they do when they run and take off from one foot. I don't know about pole vaulters, perhaps the sargent jump test is more valid with them.

GAMBETTA

The sargent jump test is really an indicator of strength, of the ability to squat. I have seen people
who could do very good sergeant jumps but could not high jump all that well and 2.20m high jumpers who were not good at all in the sergeant jump.

2. Do you differentiate between speed and power floppers in the high jump and, if so, what adjustments would you make in the training of each?

GAMBETTA
I think to properly answer this question we need to have some biomechanical information, to see some parameters. But my suspicion is that there is somewhat of an artificial pedagogical division between the two and, in actual point of fact, the training does not differ that much. Even if there are some technical components or some technical drills that the "power flopper" would do a little differently than the "speed flopper", I believe the training is basically fairly similar. Maybe it is something that we should look at more. If we find that, in fact, the take-off phase is longer, then maybe we could look for things which should differ in training. But, again, it is my suspicion that the training is not that different.

HOMMEL
In our recent work at the World Championships in Athletics and the Olympic Games, we found different patterns to the biomechanical data on the last three strides of the two types of jumpers. But I feel that in training there should not be a big difference based on this. What should be important is the abilities that the athlete is bringing with him. The two techniques are not so very different to require different training. I should point out that the trend here in the Federal Republic of Germany is towards the "speed flop". Since this has been the case we have found that we have very few, if any, injuries to high jumpers.

LOPEZ
I think we are dealing with terminology and we need some kind of a definition here. For me, a "speed flopper" is someone who we can see is fast and the "power flopper" is someone who is relatively slow at take-off.

TERAUDS
There is a real problem with terminology. A "speed flopper" is not necessarily running faster,
2. Do you differentiate between speed and power floppers in the high jump and, if so, what adjustments would you make in the training of each?

and a "power flopper" is spending more time on the ground at take-off, which means there is less power.

HOMMEL

These terms have come from non-English speaking people. "strength flop" is probably a better term than "power flop".

ALFORD

The "speed flopper" is more likely to have a very bent knee of the leading leg at take-off, which is quicker, and he doesn’t exaggerate the arm action too much. The "power flopper" looks much more like a straddle jumper. His lead leg is much straighter, which makes it more powerful, and his arm action is more pronounced. Sometimes their lead foot has the tendency to hit the ground, the way the straddle jumpers used to. But I still think that it is a characteristic of the individual. You don’t take an athlete and say "your are going to be a speed flopper". You make your own interpretation of the technique.

MACWILLIAM

That was going to be my question. Are "speed flopping" or "power flopping" coaching techniques or an adaptation of the back-lay-out jumping technique to the physical characteristics of the athlete? The athlete who is tall, light on his feet with fast leg turnover is going to come into the bar quickly and jump a "speed flop". I think the "power flop" is much more akin to the straddle. When athletes hit their lead foot it is because they have dropped their centre of mass, which is what both the straddle jumper and "power flopper" do.

HOMMEL

I think that you are totally right. It was only in history when we had many straddle jumpers changing over to flop that we saw the straightened swinging leg and double arm action similar to the straddle. Until 1976 we could see real differences between flop technique, but nowadays what we see is individual approaches to the same technique.
3. How would you promote the development of the pole vault?

LOPEZ

When I grew up in Puerto Rico every kid used to pole vault. We used to go down to the river, cut a bamboo, sand it so we didn’t get scratched and then vault over fences. We developed a lot of pole vaulters and Puerto Rico has a history of being strong in the vault in the Central American and Caribbean area. It is a part of the recreational cultural activities the youngsters do naturally. I believe it is the key to developing an event like the pole vault.

ALFORD

The problem in every place is going to be equipment, especially poles. I coach at a public track and I find that I just don’t do the pole vault because organizing the poles and the pit are so time consuming. Once there were some kids who were interested and it just happened that there was one teaching pole. I saw the kids starting to use it, just playing around. In a few weeks they were bending in the right place and letting go. But they were unable to progress further because the other poles they had were too long for them. If we can make more equipment available, especially for beginners and kids, I think we can popularize the event and that will lead eventually to a development of performance.

GAMBETTA

I think the pole vault is a very attractive event and when kids see it they want to do it. It is an event which we can promote but there are several problems which must be overcome. Within the USA we are having great problems now at the younger ages because of liability and safety. I think to promote the event the most important thing is to have a safe landing area. This would mean pooling a lot of economic resources to get a big pit so that you can feel comfortable trying these things. Secondly, as Jim said, in my experience I’ve seen different schools develop beginners, particularly where they had short poles, 3.5m to 4m, which were relative to the height of the individuals. With these short poles they can learn to bend the pole and progress very rapidly. But to do this you need a lot of poles, which comes back to pooling resources. Thirdly, we have all alluded to the fact that you need a lot of courage to be a pole-
3. How would you promote the development of the pole vault?

vaulter, but, to simplify it, vaulting is basically a swinging activity. Consequently the idea should be to teach the kids not to be so concerned about bending the pole but to swing properly on the pole. I think this is where we have made the event maybe too complicated and its scares kids off. If, in fact, you do what many top coaches do in training and get beginners to pole vault for distance or, as Victor said, across something, it actually promotes proper mechanics which are applied to bending the pole, by staying longer on the pole and swinging through.

MACWILLIAM

I think the economics of the event is something that is going to come closer and drive the event out of the mainstream of athletics. In particular, we have the legal situation, which is of definite concern in the USA and increasing concern in the other western countries, the demands for the landing surfaces to be bigger, which leads to increasing costs, and the increasing costs of poles. Unless we can come up with poles and a landing surface which are relatively inexpensive, it will become impossible to introduce and develop the event in third world countries. The way to get kids turned on to the event is to give them a chance to do it. However, I am fearful for the continued existence of the event for much longer because of the expense involved.

ALFORD

The idea of centralisation is very important for people who live in industrialised countries also. It is all very well talking about the underdeveloped countries, but you can’t get much pole vaulting done in a place like England either. They haven’t got these facilities. The only way in London, for instance, is to have one or two centres which would be where you go pole vaulting. They could have the best equipment, the best instructors, and people would come there to vault. That’s the only answer. The same would apply to other countries.

MACWILLIAM

A training pole for youngsters that is safe, fairly inexpensive and durable would be just as critical for the event to grow, because you don’t need the big
3. How would you promote the development of the pole vault?

GAMBETTA

If we are going to prepare young athletes to go on and become elite pole vaulters we need big pits. You want them to be able to take risks and not have to land backwards. I can show you the scar on my ankle caused by improper technique that was the end of me as vaulter. There was a top vaulter in the US who shattered his leg with a training pole. If you plant the training pole correctly it will shoot you out the other end of the pit, like it did to him. So you really need the big pit to learn proper technique.

4. What steps would you take to enable your athlete to be prepared psychologically for competition in the high jump and the pole vault?

LOPEZ

It all depends on the level of the athlete. One thing that we have to develop in athletes is their intellectual capacity on the day of the event. By developing this they'll understand the whole spectrum of the event, the tactics and how to act. That is what they are doing, they are acting or performing in front of people, in one case with a pole and one case without a pole. The other side is the tactical approach of passing and not passing, depending on how the competition has developed, the athlete's personal ability and fitness level at that moment. Of course, I would have to work with the individual on specific aspects but generally I would try to develop an intellectual capacity in the athlete so they really understand the event.

MACWILLIAM

Sure, they must intellectually learn the tactics of the event, but they must also condition themselves to the fact that the momentum of jumping, in terms of the timing of the jumps, will be interrupted. In both high jump and pole vault, the nature of the event is that you get long spans between attempts, then, when you've had a miss, you have to be prepared to take another jump much sooner. I think you have to do a lot of work in practice so that the athletes learn to cope with various lengths of breaks between attempts. The other thing is to adapt to the different
4. What steps would you take to enable your athlete to be prepared psychologically for competition in the high jump and the pole vault?

ALFORD
One thing these events have in common is that they are both single explosive efforts. That means that concentration is vitally important, especially when the vaulter or the jumper gets up to a reasonable height. I agree that you can teach the jumpers quite a lot in the way they prepare themselves. You have got to start by watching them during training, because you can learn a lot from them. Then you have to teach them how to mentally rehearse what they’re going to do. They have to learn they’re not going to make an attempt until inside themselves they’re perfectly prepared to do it and that the time is right. Once that time comes they have to know inside themselves that they don’t stop then, that they have to go all the way through with it. They have to learn to get the rhythm in their mind. Make it smooth and get the rhythm right. Rhythm is a better word than speed I think. Those things can be explained in simple terms to the athlete. Youngsters, even of 13, 14 or 15 can learn those things. It is also important that they learn that what they’re trying to do is to get over on the first jump and not to think that they have 3 jumps to do it. They must always try to clear on the first attempt, if they don’t, then they must concentrate on getting it on the second.

TERAUDS
I quite agree with that. For preparation, it’s absolutely right that you rehearse and do the jumps in your mind’s eye. I would probably add just a little bit to that and say that, for each jump, as you’re rehearsing it, you want to go through the rhythm in your mind. So, you go right through the run-up, you cross the bar and you land. As soon as you have finished, you want to jump again in your mind’s eye, and you keep doing it. That way you don’t get distracted. Of course, the skill is not to get your enthusiasm too high, to stay at the right level. I think
4. What steps would you take to enable your athlete to be prepared psychologically for competition in the high jump and the pole vault?

GAMBETTA
To me it's a three step process. It's knowing yourself, knowing the conditions that your competing under and knowing your competition. Those are what are going to have a bearing on your success. In terms of knowing yourself, which you've all been alluding to, competition modeling, simulation, imagery and visualization are all important. If you know your technical faults and you know your strengths and weaknesses, then you are going to imagine the competition going many different ways. By the time you get to the competition you've been in every possible situation in your mind. You have to know the conditions and the many factors that enter into the situation on any particular day. For example, I think that, in both events, if you are in inclement weather you have to start lower right away. You also want to see where the competitions is starting. You need to know where the bar is relative to your personal best as well, if you want to gamble. But hopefully in the course of training you simulated a model of all the different situations and possible courses of action so that you have at least a chance. Finally, and of possibly lesser importance, you need to know your competition, to know if you have a realistic chance to win or if you are just going for your best mark. To me the toughest thing, as a former decathlon competitor, was the waiting. In a big competition the average time is maybe one jump every 35 or 40 minutes and so you have to distribute the mental effort. So many athletes will just be watching every jump. If you watched the women's high jump in Helsinki, which was one of the most incredible competitions I ever saw, none of those four jumpers watched the other people jumping. They were totally focused on their own performance. To me, that was a real good indicator of competition demeanour which can help to control anxiety.

MACWILLIAM
I think knowing the competition is very important. However, there is a danger of getting too
4. What steps would you take to enable your athlete to be prepared psychologically for competition in the high jump and the pole vault?

caught up in what the competition is doing, too caught up in saying, 'Gee they're starting here and I've got to start there,' instead of knowing yourself and saying, 'I don't care what the competition is going to do, this is where I'm gonna come in'.

ALFORD
I think the point Vern made about the length of time between attempts was good. You can't quite anticipate that in training because you will be going on all afternoon. I've never tried autogenic training and I don't know a lot about it, but it would seem to me that is a time when some form of autogenic training would be useful. What the athletes have to learn to do is to not dissipate their energies during the waiting time as they tend to do by watching the event or walking around all the time. They have to have a period where they can relax and build up energy, then they have to have another period where they get warmed-up again and mentally prepare for the jump. That is the sort of autogenic training I admire and think is important. You learn to relax, you learn to wake yourself up.

LOPEZ
That's what I call a ritual. It's like in warm-up situations, it's a ritual and it always pays off.

GAMBETTA
Terry Orlick, a Canadian sports psychologist, calls it focusing and refocusing, but there's also a physical aspect. I see too many young athletes in the vertical jumps expend way too much physical energy re-warming up between attempts. Consequently, that also needs to be built into the imagery process. You have to realise that you have a ritual for your warm-up and a ritual which is the minimum that you have to do between jumps to be ready.

HOMMEL
In this case we should also take care of rules, because they have changed twice recently. It is important and the athlete needs to know every detail in order to be prepared to compete. The athlete who knows the rules already has an advantage.
5. Where does the greatest possibility for improvement of performance in the pole vault and high jump lie?

GAMBETTA

In the high jump, I think it is in the area of specific strength. I'm not sure that jumpers can go more towards absolute strength. However, if they can develop their specific strength levels higher they may be able to handle a greater run-up speed. There was a period of time when a lot of people were experimenting with a 12 to 14 step approach, but everybody seems to be going back to 10 now with pretty positive effects. I think the main problem with the run-up was that they weren't strong enough to handle it. In the pole vault, it is a matter of technology, to get a pole light enough, to hold higher and then be able to go faster on the runway. That is Bubka's advantage right now. He is able to hold higher and maintain his speed better than anybody else.

TERAUDS

I would partially disagree. In the pole vault, the balance between speed and how much work is being done on the pole is the key. There is an optimum velocity. You need to realise that, if you run too fast, there will be less work on the pole. If you go too slowly, you will not have enough momentum to carry you through the vault. So it's a balancing act. To accomplish the best possible jump the athlete must be able to train with almost instant feedback, by which I mean within 5 or 10 minutes in practice. They must go through and analyse again and again until the vaulter knows what velocity is the best velocity and the work that is done on the pole is optimised. It is a very delicate thing.

GAMBETTA

I think what we are talking about is breakthroughs. Bubka's dominance of the event is simply because of the fact that his effective handhold is much higher than any other vaulter and he is doing exactly what you say. He has the optimum speed to handle that handhold. If the other vaulters tried to hold that high they would land back on the runway. On that I couldn't agree with you more, but if we are talking about consistent 6.20m performances, it is going to have to be on a lighter pole with the same strength.
5. Where does the greatest possibility for improvement of performance in the pole vault and high jump lie?

ALFORD
I think we are looking all the time at the top people, the elite, for the source of a breakthrough. I don't think that is the place to look, especially in the pole vault. We need to provide opportunities and facilities for thousands more people to do the event. There are many youngsters all around the world who could be great vaulters if they could get the chance, but they never do. If you could get a large number of them vaulting they would push each other and it would be the biggest breakthrough in performance you could possibly get. The same goes for the high jump.

LOPEZ
The best high jumpers right now come from Cuba but, if you give the same sort of facilities and training opportunities to kids anywhere in the Caribbean, there would be more Sotomayors.

GAMBETTA
We tend to focus on the top level and maybe forget that high performance begins with numbers and involvement. If you get more kids and teach them how to jump correctly, out of that base you will have more potential champions. The same is true in any event.