A NEW MODEL AND APPROACH TO VIEWING POLE VAULT TECHNIQUE

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INTRODUCTION

The Pole Vault World has often debated the value and technique of what a "free takeoff" is. The most commonly accepted free takeoff model is one in which the vaulters body, just prior to the pole tip contacting the back of the box, is fully extended, with a slightly outside step (see diagram 1.1). This article raises the question of whether this is a true "free takeoff".

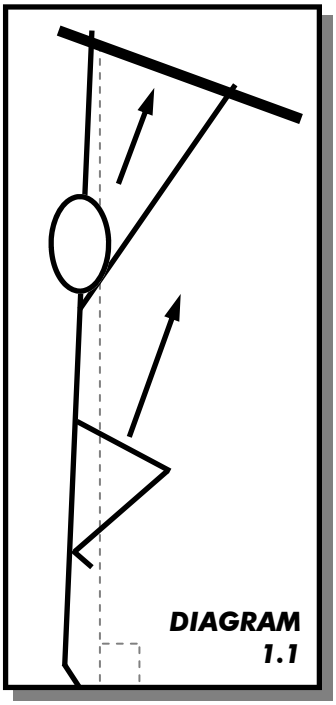

DIAGRAM 1.1

When theorizing vault technique, is it possible for a vaulter to takeoff without any hindrance? In other words, is it possible for a vaulter at takeoff, to jump freely, without any counter/negative force while the pole moves to vertical (and beyond)? In the current model, the free takeoff is solely about position and/or taking off prior to the pole tip hitting the back of the box, not about using pole drop/timing technique to allow the pole to move freely to vertical, without hindrance to the vaulter.

To my knowledge no one has ever mentioned this type of truly free take-off. We often view and teach the vault in parts (run, plant, swing, flyaway). After witnessing a drill/ technique in which a pole can be taken to vertical (and past) without the need to push the pole physically, this article proposes that we look at the vault in a whole new angle and how we coach it.

THEORY

The theory is that by using this new model, **a truly "free take-off",** which has no counter force exerted against a vaulter, can be accomplished. The result being that a vaulter will be able to:

- Maintain proper running posture
- Have a higher take-off angle
- Have a higher take-off velocity
- Use stiffer and longer poles
- Swing faster, rotate earlier and raise center gravity faster (catch ride)
- Clear high bars

The margin for error of a world class pole vaulter is extremely small compared to an average vaulter. The vaulter and the pole must become one unit/one system which depend on each other in order to produce successful vaults. Due to the size and weight of the poles used by elite athletes, the run, pole drop and plant/delivery are the most important components which must be executed precisely and consistently in order to vault successfully. Proper execution will reduce weight load on a vaulters run (pole should feel weightless if done correctly) while failure to do so will cause the vaulter to lose proper posture, use poor technique and decrease vault clearance heights.

Vaulters must train consistently from their long run in order to be successful. This technique requires precise and consistent timing which can only be developed by training/practicing with the competition run (long run). Vaulters who train primarily with short runs will have a very difficult time developing the precise timing and technique from a long run which is necessary to be successful at the world class level. It will be difficult to consistently accomplish this technique perfectly, however, the closer to perfecting this technique, the better.

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TECHNIQUE

A vaulters run should begin with their pole at a 75 degree angle. This angle must be maintained until 4 lefts out (First Triangle, see page 3) when the vaulter initiates the pole drop. During the drop the vaulters speed must increase (accelerate) and only the weight of gravity should aid in the pole drop. At the last left/takeoff (Second Triangle, see page 3), when the pole tip reaches around eye level, the vaulter should initiate the plant with his/her arms. This pole delivery is mandatory in order to accomplish the free take-off. There may be slight distance variations among different vaulters, however this is the basic model.

The need for a balanced take-off is important to allow the left arm to be in a position which places the body in an "elastic" position that allows the vaulter to swing, quickly and freely, to vertical. With this take-off model it is not necessary that the left arm be completely extended for a vaulter to be successful.

After witnessing drills and technique used by many former Soviet Republic Coaches, it can be assumed that they understand this concept, however their thoughts and ideas may have been lost, mistranslated or never stated (kept secret).

DRILL

POLE BOUNCE
www.usapolevaulting.org/articles/videos/polebounce.mpg

Standing in place, with the pole held at an angle of around 75 degrees, the vaulter allows the pole to fall (be lowered) without aid, assistance or hindrance, allowing the weight of gravity to lower the weight of the pole. Once the pole tip reaches a height around eye level, the vaulter shall initiate the plant with his/her arms. If done correctly the pole will store energy and rebound out of the vaulters hand, traveling to vertical and beyond without additional physical aid (tip of the pole should remain solidly on the ground). This drill is a technical, timing and patience drill which must be practiced continually to achieve a consistent result. An improper or poor plant/pole drop (too early or too late) will result in the pole returning energy negatively towards (against) the vaulter, however a well executed plant will place energy in the pole and aid a vaulter to take-off upwards rather than inward.

SAND PIT PENETRATION
www.usapolevaulting.org/articles/videos/sandpitpenetration.mpg

The Sand Pit Penetration emphasizes the timing of the pole drop in order to use the pole as an aid in developing penetration and pole speed. From a short run about 4 to 5 lefts out into a sand pit, using a slightly narrower than normal grip, on a pole above the vaulters weight, have the vaulter try penetrate/move pole to vertical and beyond. The higher the grip, the better the mastery of the pole plant/delivery. This drill emphasizes the technical components of this new technique and the importance of the pole drop to the success of a vault, with the distance factor (step) isolated out of the drill.

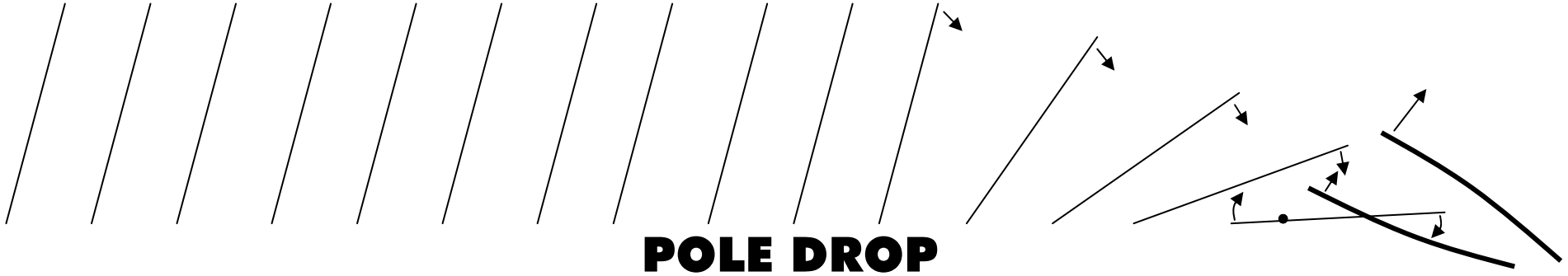
The sand penetration drill used by Petrov and Isinbayeva is a great example of how this technique is being applied.

TEACHING METHODOLOGY

- Explanation of theory/technique
- Plant Mechanics (see page 4)
- Pole Drop /Run System (see page 3)
- Pole Drop Bounce
- Sand Pit Penetration
- Development of full vault run off of runway (develop running and pole drop rhythm/consistency)
- Implementation of full vault run on the runway

POLE VAULT RUN

triangle system



Approximate distance it takes for the pole tip to fall, with the weight of gravity, from 75 degrees to around eye level

TRICK STEP

L R L R L R L R L R L R L R L R LS RS TO

START

ATHLETES *Optional*

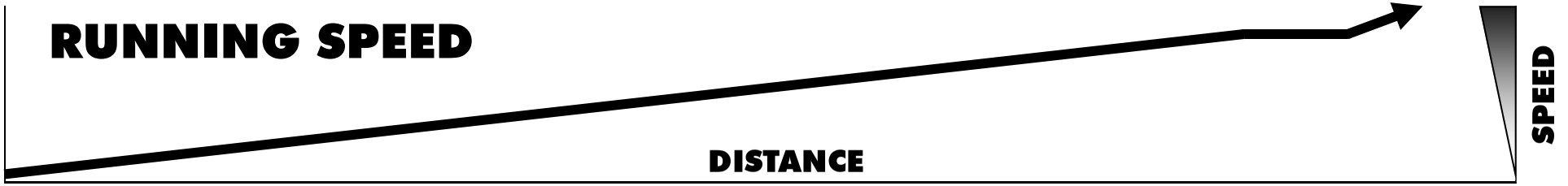
TRIANGLE 1 *Pole drop begins*

COACHES *Optional*

TRIANGLE 2

1. *Pole Tip height is around eye level*
2. *Center of gravity must rise*
3. *Arms must initiate the plant.*

TAKEOFF



THE TAKEOFF

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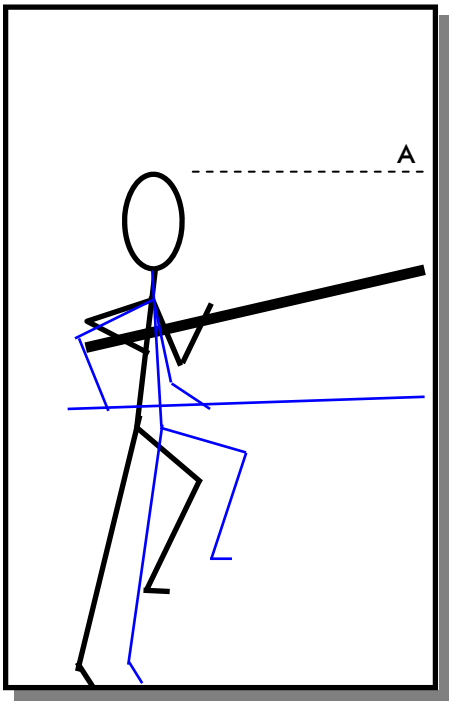
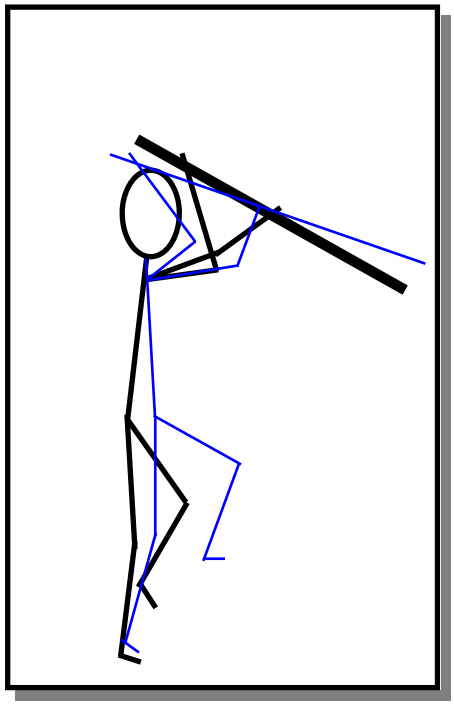
The takeoff (plant) is the most important technical aspect of the pole vault. It is responsible for transferring running energy(speed) into the pole and setting up the swing/rockback. As the efficiency of the plant increases, a greater amount of energy is transferred to the pole, allowing for the use of stiffer poles and increased clearances.

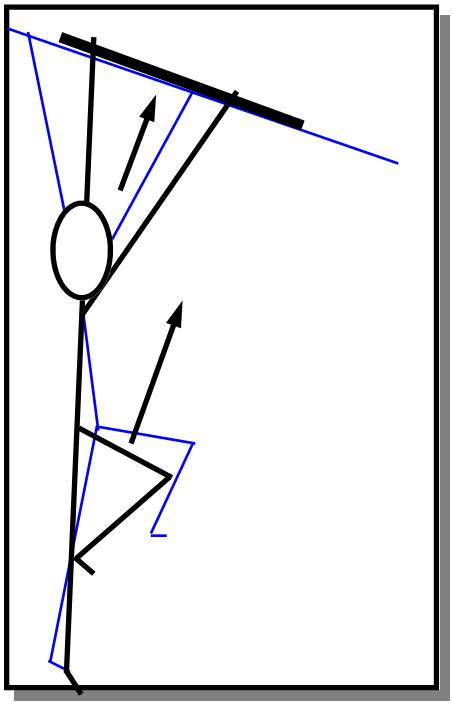
Previous biomechanical studies have shown many vaulters to be inefficient in the transfer of running energy into the pole (1991 Tokyo World Championship Biomechanical Study). Often, coaches have utilized set up techniques which produce inefficient takeoffs. This causes vaulters to be consistently under their top hand at takeoff. Adjusting the running distance (step) will not alleviate this problem. In order to increase efficiency at takeoff, maximize pole size, swing ability (rockback) and heights, coaches and athletes should consider converting to this European/Russian plant teaching system.

These methods utilize a takeoff placing the pole vaulter at a 90 degree angle, perpendicular to the pole. An example can be demonstrated by placing a pole horizontally supported at each end. Bending of the pole is most efficient when force is applied at a 90 degree angle (perpendicular to the pole). Any angle greater or lesser than 90 degrees would result in lost energy. The pole vault takeoff should emulate this concept (figure 3). Set up should prepare the vaulter to takeoff at this angle.

The following diagrams demonstrate a three phase model of this takeoff (the model is a right handed vaulter: left foot, right foot, takeoff). The light colored figures represent set up techniques resulting in inefficient energy transfer.







Left Support Phase (Fig. 1)

- A Right hand is parallel to the body, not behind it.
- B Both arms are tucked up high (forces the vaulter to plant forward).
- C Body is in a slightly forward sprinting (power) position.
- D Pole tip is at position at about the top of head level (A)

Right Support Phase (Fig. 2)

- A Both arms are in front of the head (the arms guide and the body follows behind).
- B Body is in a balanced position.
- C Left leg is cocked and ready for a explosive takeoff (penultimate step).
- D Arms are ready to help jump

Takeoff Phase (Fig. 3)

- A Arms and body are creating a 90 degree angle with the pole.
- B Both arms are extended and equally placing pressure into the pole.
- D Body and foot are fully extended prior to the pole impacting the back of box.