

# Evolution of the Pole Vault

Revision 2

The Pole Vault has been an Olympic event for Men since 1896, and women since 2000. This article will examine the development and evolution of the Pole Vault.

## Early Origins



Bul Leaping source: <http://travelingclassroom.org/?p=124>

Pole Jumping competitions were known to the ancient Greeks, Cretans and Celts. It was used in warfare sieges to get over obstacles such as enemy walls or used to vault onto animals such as bulls and horses.

Poles were used as a practical means of passing over natural obstacles in marshy places such as provinces of [Friesland](#) in the [Netherlands](#), along the [North Sea](#), and the great level of the [Fens](#) across [Cambridgeshire](#), [Huntingdonshire](#), [Lincolnshire](#) and [Norfolk](#).

Artificial draining of these marshes created a network of [open drains](#) or [canals](#) intersecting each other. To cross these without getting wet, while avoiding tedious roundabout journeys over bridges, a stack of jumping poles was kept at every house and used for vaulting over the canals. [Venetian gondoliers](#) have traditionally used punting poles for moving to the shore from their boat.

In 1775 Poles were introduced into gymnastic competitions in Germany, for a vertical event.

One of the earliest pole vaulting competitions where height was measured took place at the [Ulverston Football and Cricket Club](#), [Lancashire, north of the sands](#) (now [Cumbria](#)) in 1843.<sup>[2]</sup> Modern competition began around 1850 in [Germany](#), when pole vaulting was added to

the exercises of the [Turner](#) gymnastic clubs by [Johann C. F. GutsMuths](#) and [Friedrich L. Jahn](#). The modern pole vaulting technique was developed in the United States at the end of the nineteenth century. In [Great Britain](#), it was first practiced at the Caledonian Games.

Initially, vaulting poles were made from stiff materials such as [bamboo](#) or [aluminum](#). The introduction of flexible vaulting poles made from composites such as [fiberglass](#) or [carbon fiber](#) allowed vaulters to achieve greater height.

Physical attributes such as speed, agility and strength are essential to pole vaulting effectively, but technical skill is an equally if not more important element. The object of pole vaulting is to clear a bar or crossbar supported upon two uprights (standards) without knocking it down.

## Evolution of the Poles

### Hardwood

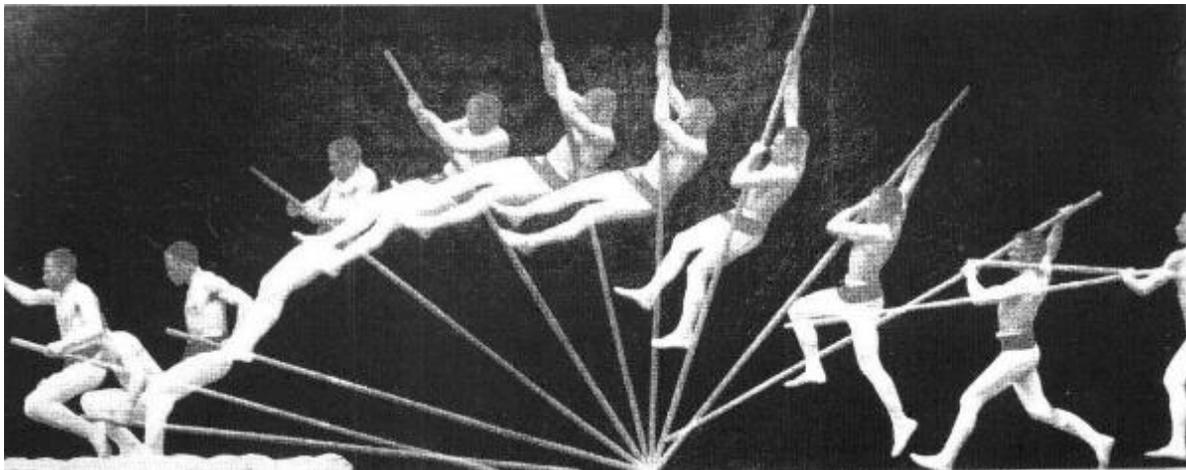


Figure 5: 1889 Photo showing the different stages of the early straight-pole technique used with ash or hickory poles.[/caption]

Competitive pole vaulting began using solid Hardwood (Ash or Hickory) poles. Were used in the mid 19th Century when Pole Vaulting began. The athlete would climb the pole after he planted and jumped, and throughout the jump the pole remained rigid and had essentially no bend.

In 1889 American vaulters banned the pole-climbing technique and implemented the swing-up technique, an early version of the modern method, which added height to the vault. Despite the advancement in technique the hardwood poles were limited as they had no bend.

As a result, the poles could not transfer horizontal motion into upward motion efficiently as a large amount of energy was lost in the plant and vaulters were constrained to lower heights.

## Bamboo



Ash poles were followed by Bamboo Poles (photo credit: m-cause.com)[/caption]

Around the same time that the swing-up method was introduced as the definitive technique in the vault, bamboo poles began to replace the hardwood ones. The swing-up necessitated a new type of pole that had some bend, and bamboo fulfilled that need.

Also, the box was introduced into the plant stage (previously vaulters had simply stuck the pole in the ground), which required the pole to have some bend as well. The swing-up technique can be seen in Fig. 6, where a vaulter uses one of these new poles to clear a height.

Bamboo poles were much lighter than the solid ash or hickory poles due to the fact that bamboo is naturally hollow, which allowed for a faster approach. Additionally, these poles had a lesser degree of stiffness and thus had a minor ability to bend when stressed.

For these reasons, vaulters were able to carry more energy into the vault and convert more energy into an upward motion.

By 1942, the world record, set on a bamboo pole, was recorded at 4.77 meters [2]. However, the bamboo pole still presented limitations to achieving higher heights. The pole still did not bend enough to significantly increase the efficiency of the vault and a large portion of energy was wasted once again on the plant. Additionally, bamboo is weaker (can take less stress/bending before breaking) than both the hardwood poles used before it and the fiber-glass poles used after, so vaulters could not put as much force into the poles, thus limiting the heights that they could achieve.



Figure 6: Photo showing the different stages of the straight-pole, swing-up technique used along with bamboo poles.[/caption]

As the heights increased Bamboo poles gave way to Aluminum which was tapered at each end.

### **Fiber Glass and Carbon Fibre**

While steel and aluminum poles made a brief appearance in the world of pole vaulting in the 1950s and 60s, the next major advancement in pole technology came in the form of fiber-glass and carbon-fiber poles. A cross-section of the design of these poles can be seen in Fig. 7, which shows the different layers that allow the fiberglass pole to be so versatile and effective. The poles were first introduced in the U.S. in 1956, and immediately made an impact on achievable heights, evidenced by the new world record set in 1961 at 4.83 meters [2].

With minor adjustments to the structure of the new poles, and the addition of carbon-fiber layers, these poles have become significantly more efficient at transferring and converting the vaulter's energy. Refinement of the swing-up technique has also augmented the effectiveness of the

fiberglass pole, and vaulters are able to go higher with the same amount of energy put in. These poles are substantially stronger, lighter, more flexible, and more responsive than any other pole used before, and have allowed pole vaulters to launch themselves to even greater heights.



Carl Geisser 1964, As in the high jump, the landing area was originally a heap of sawdust or sand where athletes landed on their feet (Photo Credits: Islander Track)

As technology enabled higher vaults, mats evolved into bags of large chunks of foam. Today's high-tech mats are foam usually 1–1.5 meters (3 ft 3 in–4 ft 10 in) thick. Mats are growing larger in area as well to minimize risk of injury. Proper landing technique is on the back or shoulders. Landing on the feet should be avoided, to eliminate the risk of injury to the lower extremities, particularly ankle sprains.

Rule changes over the years have resulted in larger landing areas and additional padding of all hard and unyielding surfaces.

**Sources:**

[Illumin Journal, University of Southern California June 13, 2013 Volume XIV, Issue II, Matthew McCormick](#)

[http://en.wikipedia.org/wiki/Pole\\_vault](http://en.wikipedia.org/wiki/Pole_vault)

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