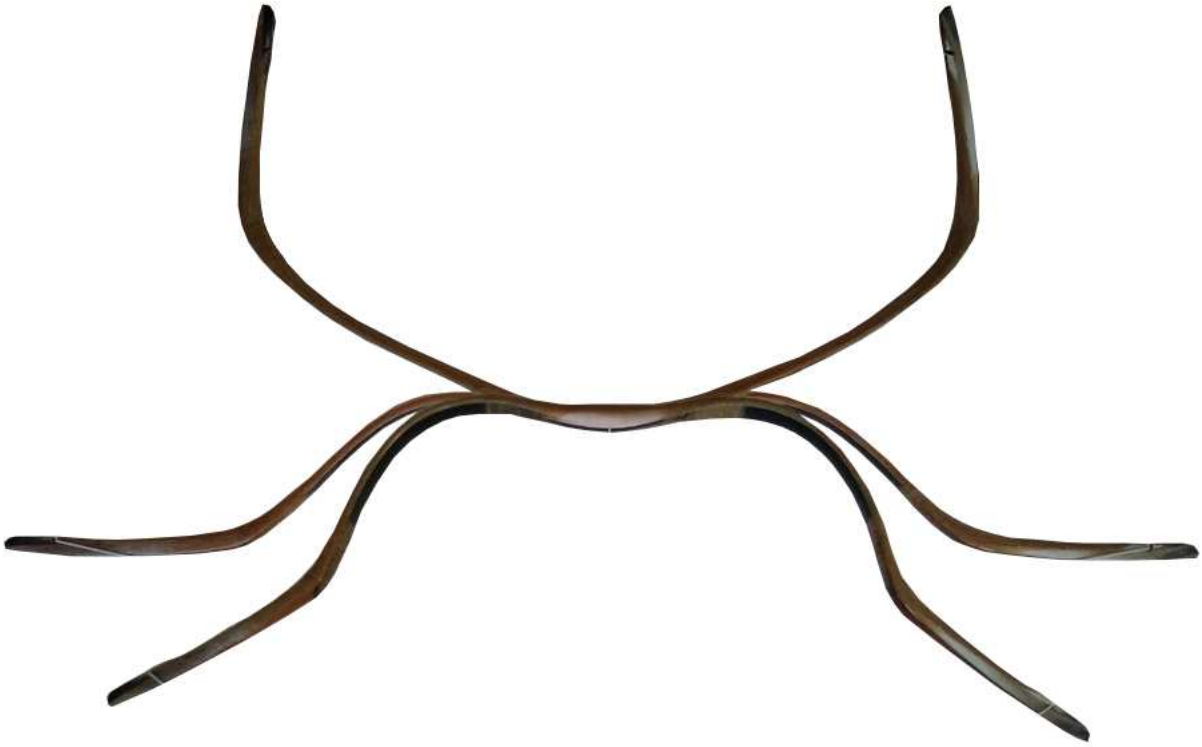
Péter Bencsik

The Hungarian Bow of the 9-11th centuries

– recommendation for bow constructions –



2011

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Preface

Despite the limited available factual data, a great deal of unproven probable information has been widespread in the public about our forefathers' fearful and notorious weapon.

Until now the Hungarian Bow of the 9-11th centuries has only been known based on a few bone plate findings. Peter Bencsik is a new generation bowyer who constructs Hungarian bow replicas from natural materials. Based on his personal experiences, he has undertaken to summarize the most important criteria and knowledge of the bow which can be considered as basic features.

Besides the „standardization" of the bow's features, the greatest merit of Bencsik's work is the technical vocabulary of the bow parts, providing a common and uniform knowledge for the next generation of archers and bow makers.

Being a teacher as well as the president of the Hungarian National Archery Federation I recommend this study for all those with an interest in the subject, because it fills a gap and it can also be used as curricula at school.

Levente Igaz

Introduction

The bow was our ancestors' most important weapon, and it is mentioned in numerous contemporary sources. Leo VI the Wise, Byzantine Emperor (886-912) describes the Hungarians' weapons as follows:

"The weaponry of the Hungarians is sword, leather armor, bow, spear; and thus in the battle most of them carry two weapons; spear on their shoulders, bow in their hands, using one or the other as necessary."

Regino of Prüm, Benedictine abbot in his Chronicon gives the following characterization of the Hungarians:

"They are tough through weariness and battles, their physical strength is immense...they kill less with swords, but many thousands with arrows, which are shot from their horn bows so skillfully, that it is nearly impossible to defend oneself against them."

We only possess indirect information about this weapon, since the only remains found in 10th century graves are bone (antler) plates used to stiffen the grip and the ear of the bow. Other, softer parts (such as wood, horn and sinew) crumbled to dust, thus one can only deduce the exact size and form of this dreadful weapon.

Figure 1. Bone plates

In the 1920s, numerous 10th century graves were discovered. Among spears, sabers and other findings, long and narrow bone plates were revealed (Figures 1-2.). Their purpose was unknown, until an ethnographer Károly Cs. Sebestyén realized that their task was to stiffen the grip and the ears.

Following this discovery it became apparent that the Hungarian bow was of Asian type.

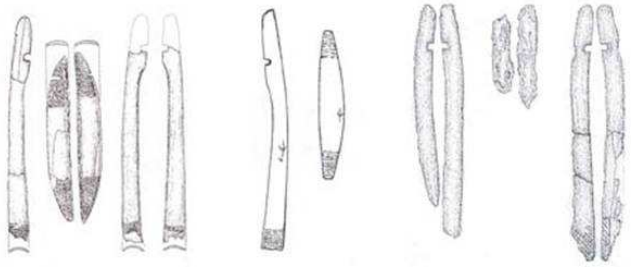

Figure 2. Bone plates from 10th century graves

As a next step, Cs. Sebestyén tried to define the exact shape of the bow, which was especially difficult. At that time no sketches were drawn of graves, thus the original position of the plates inside the graves is not known. This is the reason that the Asian bow has been used as reference during the construction. Cs. Sebestyén has finally come to the conclusion that the unstrung bow limbs between the grip and the ears were straight. One can deduce the possible limb angle from the shape of the grip bone-plate (grip angle). The angle between the limb and the ear is the result of a calculation based on the assumption that the string touches the ear at only one point, at the neck of the ear (Figure 3.).

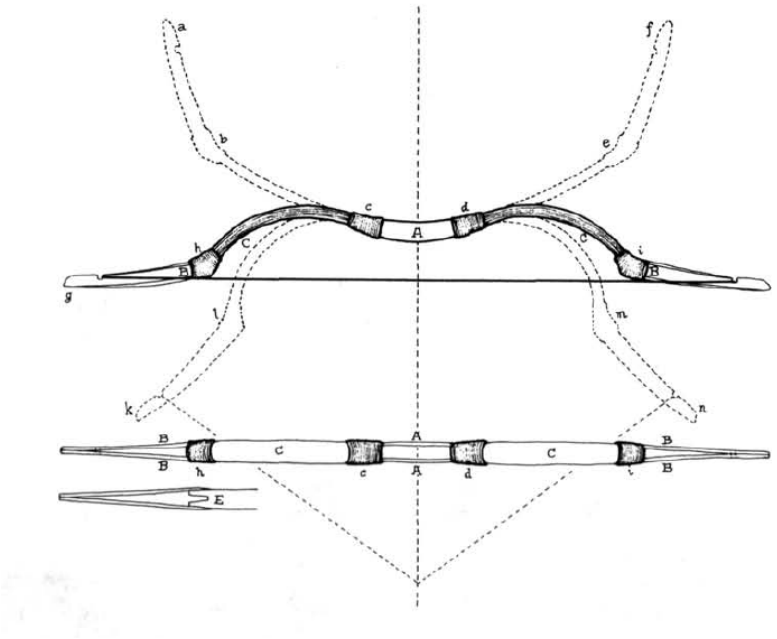

Figure 3. Cs. Sebestyén Hungarian bow construction

Gyula Fábián, professor at the Gödöllő Agricultural University has become interested in Cs. Sebestyén's descriptions. He has been long engaged in archery and is especially enthusiastic about the Hungarian bow. Although Cs. Sebestyén's theoretical construction answered his fundamental questions, Fábian wanted to know more. Some of his questions could only be answered though experiment, so he decided to build a copy of the bow. He has actually built over a dozen replicas. Fábián has found that maple is the best for the core. Deer sinew was used for the back side, while the belly side was covered with horn of the Hungarian grey cattle. Bone plates were made of antler. Most of Fábián's achievements confirmed Cs. Sebestyén's constructions with the only difference being in the shape of the un-strung bow (Figure 4).

Fábián has built less reflexed bows, reducing the danger of untwisting the limbs simultaneously and degrading the bow's efficiency.

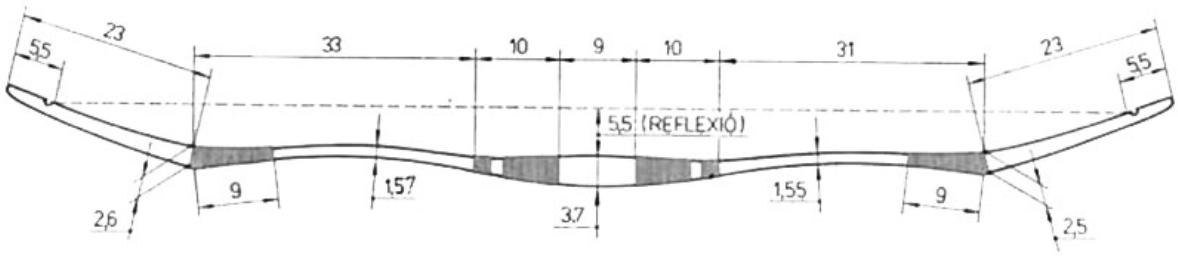

Figure 4. Gyula Fábián Hungarian bow construction

Besides Cs. Sebestyén and Fábián, others such as Kálmán Jakus have studied 10th century Hungarian grave artifacts, based on which the framework, form and parameters (size) of the weapon of that era were successfully reproduced. Until today, over a dozen people with zest for experiment have built operable Hungarian horn bows which show notable differences.

This study is not aimed at building uniform bows, irrespective of builders and available materials; however, the dispersion of imaginative "Hungarian bows" must be delimited. Modern reconstructions based on known technological restrictions of the period have also changed our view of Hungarian horn bows. We can confidently state, as these findings support, that some recent bow constructions have nothing to do with our ancestors' weapon.

Those who wish to resurrect the authentic Hungarian bow know that to eliminate the differences in shape and size is only possible within the limits provided by the grave artifacts.

The Hungarian National Archery Federation (HUNAF) has two main aims, firstly to make the Hungarian bow a protected "Hungaricum" of our nation's historical memory and secondly to make traditional archery with the Hungarian Bow a part of our intangible cultural heritage.

This study is meant to provide the first, necessary step in standardizing the Hungarian bow. To facilitate this work, we wish to establish the bow-related parameters, as well as to standardize the designation of the bow constituents.

Besides the definition of the most characteristic values, in the next part we wish to make also recommendations based on our experience.

Definition

The Hungarian bow is a Central-Asian-type (puszta) composite bow, made of natural materials (sinew, horn, bone and wood), built with complex (bending) limbs and rigid ears (in some cases equipped with stiffener (antler) plates).

Main parts

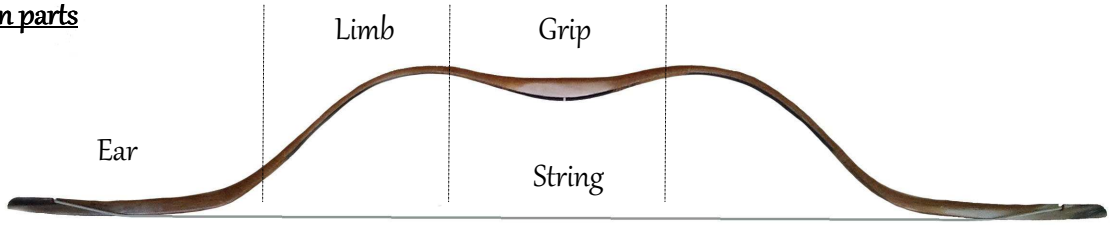

Figure 5.

Ear

The form of the ears is the "trade mark" of the Hungarian bow. The graceful and light ear plates contain typical functional elements, which are characteristic – besides only a few – of Hungarian bows only (Figure 6). One of them is the relatively big "forehead" (Figure 9), the purpose of which is still unclear.

Since we do not have direct evidence whether our ancestors used bows only with stiffened ears, those without stiffener plates are acceptable, if they are built in accordance with the general description or they are the original copies of 9-11th century grave artifacts.

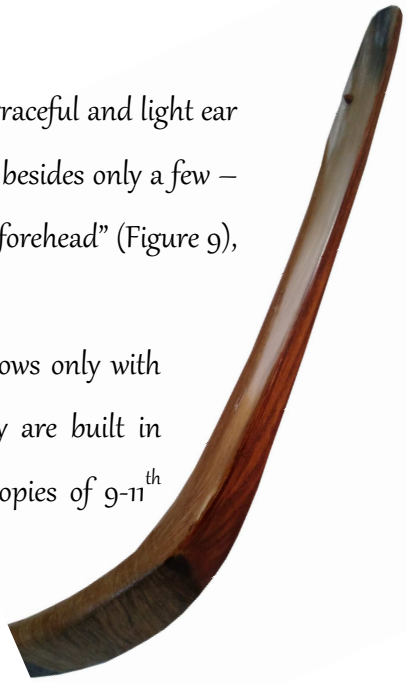

Figure 6.

Maybe the most common "mistake" of today's Hungarian bow constructions is the oversized and mass-produced ear shape – uncharacteristic of findings – which negatively influences bow efficiency. In the matter of sizing, one should aim to construct a bow that is as light as possible, but still safe.

Based on its build, the ear usually consists of three constituents:

- wooden core
- side stiffeners (antler, bone, horn or other natural materials)
- sinew plate (one or more sinew layer(s))

The ear itself can be divided into two parts, the head and the neck. On certain ears ("header" plate findings) the head (the part above the line drawn between the chin-tip & the nape-point) is very distinct. These parts cannot be identified on many findings. Due to the lack of reference points, the head is normally 1/3 of the length of the ear, while the neck is the lower 2/3 (Figure 7).

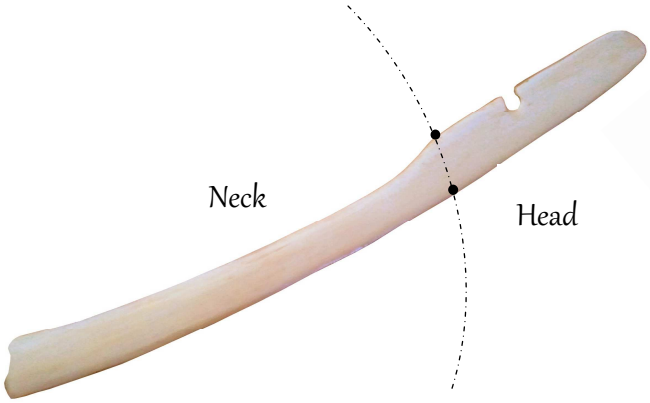

Figure 7.

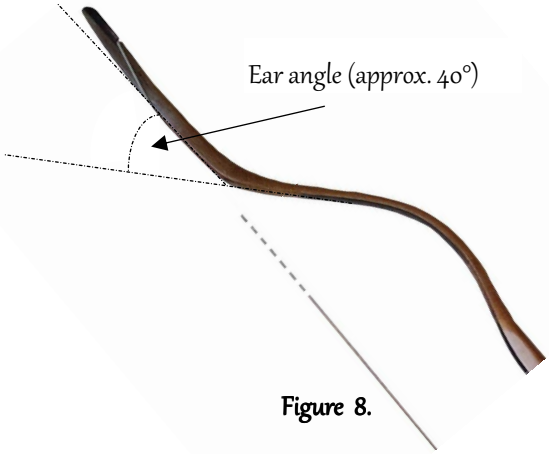

Figure 8.

Parts of the head:

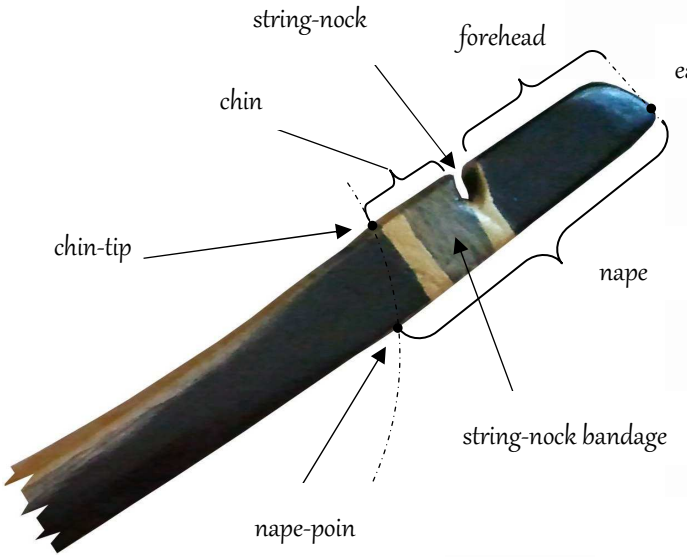

Figure 9.

Parts of the neck:

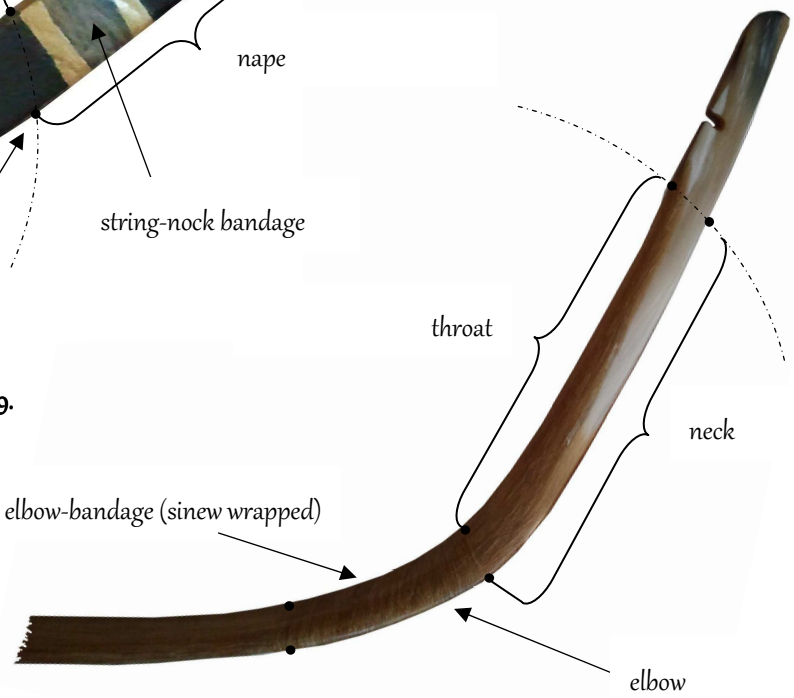

Figure 10.

Limb

Hungarian bows store mechanical energy in the limbs. Consequently, "rigid" ears (see definition) are not allowed to store energy arising from flexibility. Energy storage in ears can be a reason for disqualification. Bow dynamism can only result from the energy stored in the limbs. Many variables – which are not restricted by this "standard" – affect the limbs' efficiency in transmitting the stored energy to the arrow. Limbs are subject to extreme tension and repetition. While the limb is bent the outer side of the material is stretched and the inner side is compressed. Every material reacts differently to stretch and compression. Consequently, a kind of material has either a better tension or a better compressive strength. Furthermore, the material has to be tenacious since it has to endure strain several thousand times.

To achieve the above features, the limb structure of the Hungarian bow is "complex," as are classic Asian bows. It has to be made of sinew plates (layers), a neutral-flexibility wooden or bamboo core, and a horn plate (Figure 11). The ratio of these materials (sinew, wood and horn) is not predetermined as long as they match the general parameters.

Limb parts:

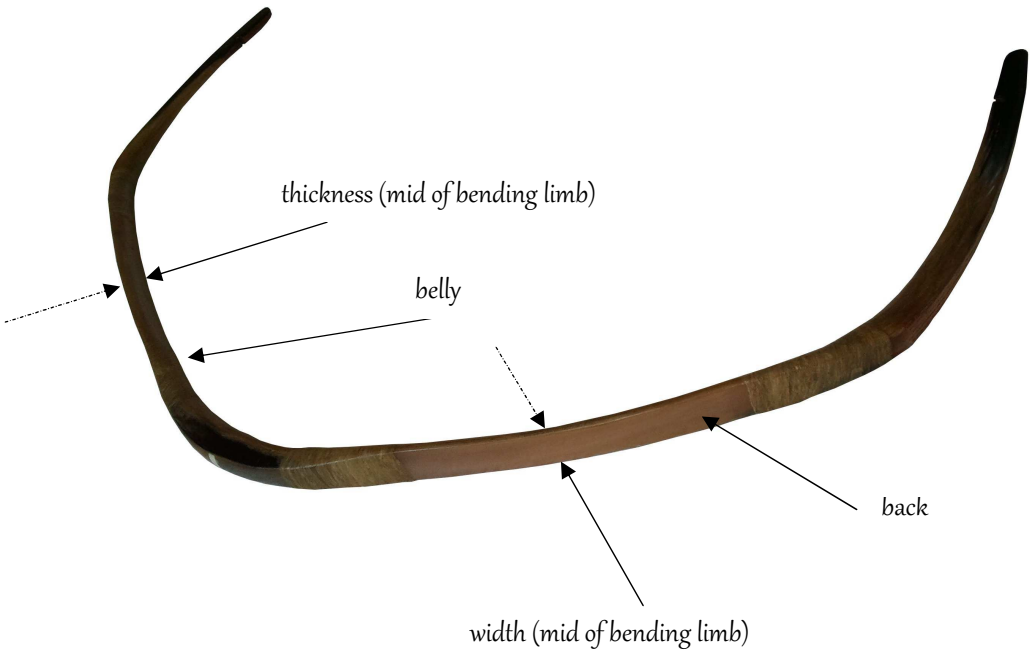

Figure 11.

Grip

The grip shape of the Hungarian bow raises an important question, namely which grip type was applied more often; the one with a grip angle of 170-180°, or the other with less than 170° (Figure 12.). In many cases the position of the stiffener plates found inside the graves provides an answer; however, due to the lack of solid evidence, it is not our intent to tie bowyers' hands.

Similar to ear stiffening, grips without stiffener plates are acceptable (Figure 13), yet HUNAF recommends the use of stiffener plates.

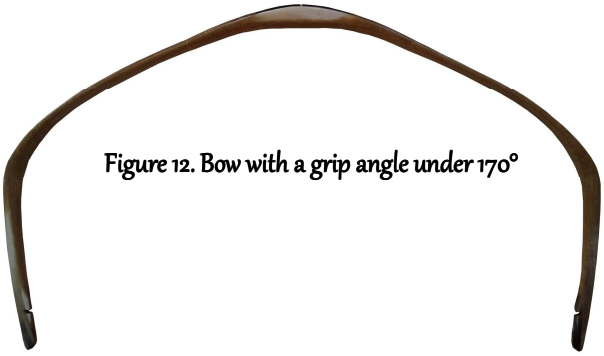

Figure 12. Bow with a grip angle under 170°

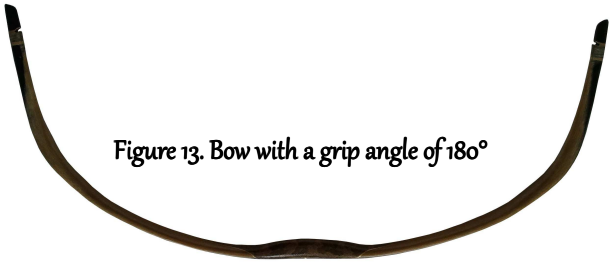

Figure 13. Bow with a grip angle of 180°

The "rigid" grip is not allowed to store mechanical energy. The transition point between the rigid grip and flexible limb – which is difficult to define accurately – is called "bow-shoulder". This point is often covered by bandage (Figure 14).

The horn plates covering the flexible limbs usually end on the grip. Their joint and fastening method (e.g. use of grip spacer or grip peg) is not restricted.

The grip usually consists of three structural parts:

- wooden core
- side stiffeners (antler, bone, horn or other natural materials)
- sinew plate (one or more sinew layer(s))

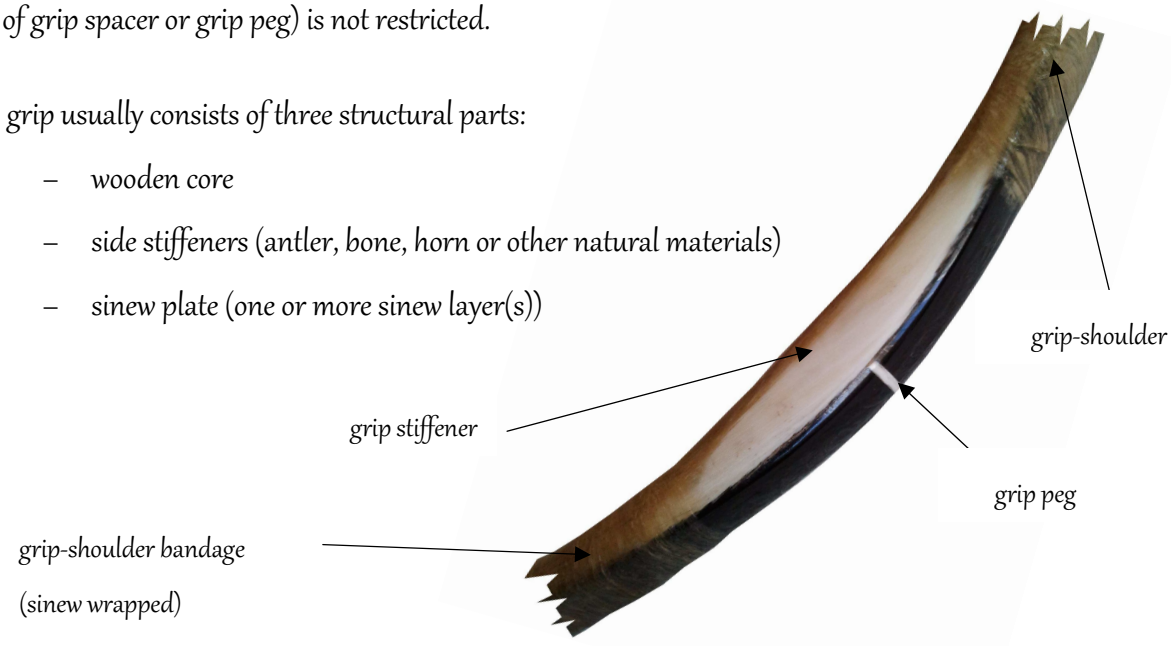

Figure 14.

String

Probably the most disputed issue at the moment is the question of the string(s) used. Based on HUNAF's recommendation (in order to provide an environment for the experiments to bring tangible results earlier) the string of the Hungarian bow shall only be made of natural materials (e.g. sinew, leather, gut, silk, vegetal fiber or a combination of any of these natural materials) (Figure 15).

Currently string reproduction experiments have just begun and the use of artificial strings is temporarily permitted.

Irrespective of this, HUNAF is planning to organize competitions in the future, where archers are only allowed to use bows equipped with natural strings.

String parts:

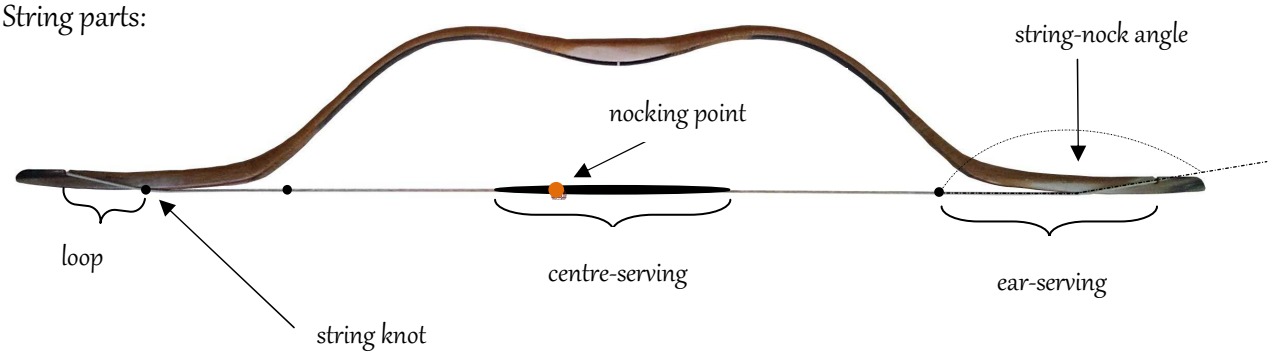

Figure 15.

Parameters of the Hungarian Bow

- constructed without any string-pads (string bridge)
- total length, measured on the horn (belly) side between the two ear-tips is less than 1450 mm (recommendation: between 1300-1400 mm)
- distance between the string-nocks (nock-to-nock) – measured on horn side – is not more than 1380 mm
- minimum length of the ears 200 mm but not more than 300 mm (recommendation: between 220-280 mm)
- forehead height of the ear is minimum 35 mm
- grip angle is less than 180° (recommendation: between 150-170°)
- recommended ear angle of strung bow is between 30-45° (Figure 8)
- angle between the string-line and knot-to-nock line (string-nock angle) is not less than 150°
- width of the limbs is less than 45 mm (recommendation: between 35-40 mm)

- string is made of natural material(s) (use of artificial string is temporarily allowed)
- bow coat (cover) can only be made of natural materials (e.g. leather, bark, etc.). The use of artificial materials such as synthetic varnish is prohibited
- structural parts must not contain artificial materials (e.g. synthetic adhesives and glue)
- if the size of a unique bow (built for an archer with an uncommon draw length) is outside the required parameters, but the ratio of its parts fits categorization will be decided on a case-by-case consideration (e.g. at HUNAF events)

This study has been written with two aims. On the one hand, the elaborated recommendations to standardize the Hungarian bow are meant to support bowyers to build replica constructions. On the other hand, we wish to provide help for those archery federations (and other organizations) who want to execute Hungarian bow categorization based on predefined and measurable parameters.

The Hungarian National Archery Federation is awaiting recommendations and information on findings, which can contribute to further development, refinement or complete revision of this publication.

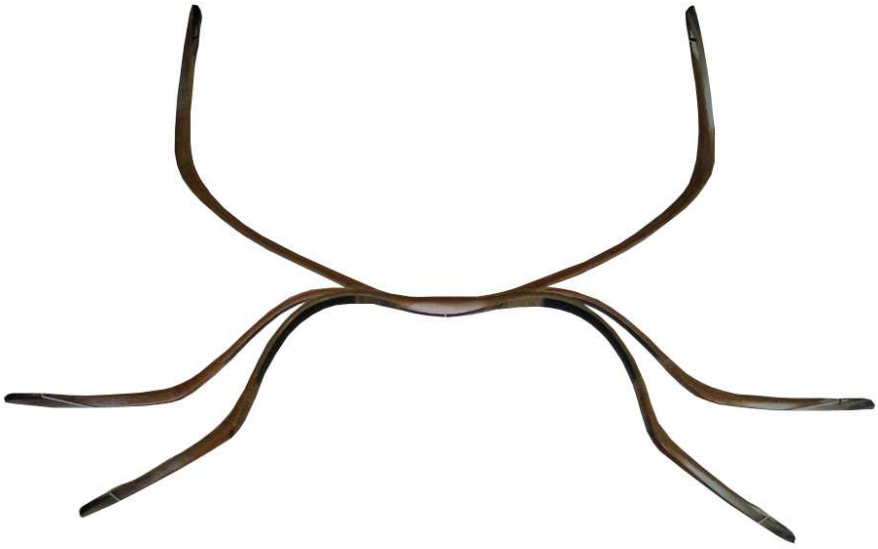

Figure 16. Hungarian Bow unstrung, strung and drawn

This study was written with the cooperation of the professional comities of the HUNAF.

The Introduction of this study was based on Bálint Csikós' *The Magyar Bow*

Special thanks to László Borbély, PhD Sándor Paku and PhD Balázs Sudár for their effort and contributions.

Bow constructions in figures are made by the author.