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**The Dancing Moon**  
**February, 2017**

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**W**arfare **L**ooms!



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**Gulf Wars XXI**

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**HL Paul Works on Largesse at Coronation, January 2017**

**ART, ARTICLE, AND PHOTO CREDITS**

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**HL Roselyn makes sure HL Paul Doesn't Starve at Coronation,  
January, 2017**

## SHIRE ANNOUNCEMENTS

The Dancing Moon is always published during the second week of each month (or as close to it as possible) rather than on the first of the month.

If you find an error that needs correcting in the shire newsletter or on the shire website, please inform your web minister or chronicler ASAP. It may make her grumpy, but she needs to know.

Please submit next month's announcements to the Chronicler by March 21.

Several of our officers are at or nearing the expiration of their warrants and are seeking deputies to train

Please contact the appropriate officers if you have any interest in learning the intricacies of and taking responsibility for any of the following positions:

Seneschal Fighter, Fighter Marshal, Minister of Arts and Sciences, Exchequer

Officer contact information can be found on page 9 of this newsletter.

**Congratulations to Her Ladyship Nest, the shire's newest Silver Hammer!**



Photo by Lucy E. Zahnle (SKA Lady Dulcibella de Chateaurien) ©2017 Used with permission.

**Their Newly Crowned Majesties Ashir and Ashland at their Coronation, January, 2017**

## Minutes of the February Meeting

### *Officer Reports*

**Arts and Sciences:** HL Paul taught a class on siege machines in January. Lady Margery will teach a to-be-determined class in February. In lieu of a class in March, the shire will hold a Gulf Wars review.

**Fighter Marshal:** No practice in February because of weather and lack of fighters

**Cut and Thrust:** Waiting for volunteers for a practice.

**Herald:** No Report.

**Archery:** Been no practices for awhile. Weather has been the major factor. See Newsletter for weather restrictions. January 8 meeting at Alan's was primarily focused on Arts and Sciences because of the weather. No archery practice at Beaver Creek Conservation Area on February 26 because of Chieftains.

**Exchequer:** \$3,813.34 on hand.

Owe: tithe [to be determined].

Have paid: \$100 deposit to St Robert Community Center for Spring Spears [March 31- April 2]. Will need to pay remainder of \$450 total bill before the date. This is both new policy and a greater fee.

**Web Minister:** Dulcie is new webminister.

**Chronicler:** Dulcie is new Chronicler.

### *Old Business*

Reminder: **Chieftains** is in late February.

~ Tithe amount has usually been half of the Autumn Arrows Auction.

~ HL Paul has volunteered to provide a number of medallions for the tithe.

~ Please be thinking of what we can do as largess.

**Spring Spears date** [March 31- April 2] **has been confirmed** on the Kingdom Calendar. Site. St. Robert Community Center has been secured.

Room currently being used as our **meeting room has been confirmed** for the first half of 2017.

### *New Business*

**Spring Spears:** Looking for event steward volunteer and helpers. If you have an idea for an event, speak up!

Join the Shire of Calanais Nuadh for

**Spring Spears XIV:  
Plowshares into Spears and Axes**



March 31-April 2, 2017  
St. Robert Community Center  
114 J.H Williamson Dr.  
St. Robert MO 65584

Site opens at 5pm on Friday and closes at noon on Sunday. No camping, but crash space is available. Site is discretely wet.

Site Fee:

Adult Event Registration--\$15

Adult Member Discount Registration --\$10

Youth (12-17)--\$5

Child (0-11)—Free

Dancing Moon Inn will be available for lunch

Feast on Saturday will be \$10 per seat.

Please contact Event Steward with any dietary considerations.

Please make checks payable to SCA INC-Shire of Calanais Nuadh

More Information in Next Month's Dancing Moon or on the web at  
[www.shireofcalanaisnuadh.org](http://www.shireofcalanaisnuadh.org) (will be posted by February 28).

Event Steward:

Thomas Fleischacker (Thomas Glueck)

573-336-5281

glueckc@yahoo.com

## ***CLASSICAL AND MEDIEVAL PROJECTILE SIEGE WEAPONS Evolution, Systems of Operation, and Nomenclature***

***HL Paul Adler, OSH***

The use of projectile siege weaponry, which is to say weapons less wieldy for an individual than personal weapons like a bow, sword, or axe and used primarily to defend or attack a fortified static position, dates back to the Greeks of the Peloponnesian Wars, reaching a high state of sophistication in the Punic Wars, and latterly the Roman Empire and its successor state, Byzantium. With the fall of Rome, the technology took a big step backward in Western Europe, though preserved in the East.

Development halted with the onset of the Dark Ages, although the technology had pretty well been taken to its limits in the Roman Empire, and the ability to maintain and make the parts for sophisticated launching machines ceased to exist in the tribal warlord states that succeeded the titanic organizational and economic machine that was Rome. In place of sophistication, as Europe gradually began to coalesce into economic states rather than unstable, basically-agrarian tribal entities, human ingenuity rose to the occasion and replaced mechanical sophistication of the Roman machines with the brute force solution of the trebuchet, which is probably familiar to all of us since it is the most easily-made of all the large projectile weapons.

Gunpowder, in the form of the earliest dart launchers, hand pole cannons, and then petards began to enter the scene during the Hundred Years War in the 1300s and would fairly quickly displace the huge array of variations in mechanically-powered projectile engines, though niches remained for them through World War I, where mechanical 'Catapults' (As almost all such weapons are generally called by the layman today) were widely used by both sides for flinging grenades into enemy trench lines through the end of the conflict, as were staff slings, as they required less exposure to fire as well as being less variable and demanding to use than mere throwing and providing better range than a physical throw.

And so after that brief introduction, turning back to the earliest times, it would be useful to break down these weapons into three broad categories:

1. Weapons that are based on a solid spring, relying on tension and compression of the spring material, in the same manner as the limbs of a bow, which I'll refer to as 'Spring weapons.'
2. Weapons relying on the torsion forces in one or more twisted skeins of rope for storing the energy to throw the projectile which for this class will be referred to as 'Torsion-spring weapons, and
3. Weapons that apply force through levers rather than springs of any sort, or 'Lever weapons.'

Each of the three types at one time or another would apply different types of projectiles (Solid, incendiary, and what we would today think of as biological or chemical weapons, even explosive ones at the dawn of the gunpowder age). Each would, at one time or another, incorporate a sling carrier for the types of projectiles other than darts, bolts, or arrows, in the manner of a staff sling, and so these features do not really amount to distinguishing characteristics of any of the three types except in differentiating one variation of a particular weapon from another within the same mechanical group.

With that laid out, let us look at a chronological walk-through of the development of these weapons with their names and systems of operation:

***Gastrophetes and oxybeles*** – Dating to ca. 400 BC, the gastrophetes was a large solid-spring crossbow, with the butt in the shape of a U braced against the shooter's chest so he could use both hands and arms to cock it while it was so braced. The bow was longer and considerably more powerful than an archer's bow, and the projectile an arrow. The cocking mechanism incorporated the ratcheting slide so characteristic of most later throwing engines, but was still small enough that it did not use an attached stand or base to mount and stabilize it for firing. It relied on one operator. The oxybeles was a more powerful and larger adaptation, mechanically similar but now mounted on a stand, and firing either a lance or a stone shot, powerful enough that a type of windlass was necessary to cock it. The gastrophetes was one of the first weapons clearly not just an individual

combat weapon, moving into what would be a crew-served weapon with the oxybeles.

**Lithobolos** – “Stone thrower” - Less than a century after the gastrophetes, the torsion-spring lithobolos appeared, some time prior to 330 BC. It was very much like a stone-throwing oxybeles, except that the bow had been replaced by two vertical rope skeins on either side of the projectile way, and the compartmented wood framework necessary to support the skeins. In these early days, the metal washers and ratcheting pawls used to tighten the skeins had not yet been invented, which limited both the power of the torsion springs and the lifespan of the frames due to the rods in the ends of the skeins setting into the frame. This system, obviously heavier and more awkward than the oxybeles, relied on a cocking windlass and a substantial base (on which it was flexibly mounted) for use.

**Catapult** – Actually not so much a distinct weapon as a broad Latin name for all sorts of weapons that relied on two torsion-spring skeins on either side of the projectile way, though it seems to be mainly applied to arrow throwers at first. The word means 'Shield breaker.'

**Ballista** – The lithobolos evolved over the next two hundred-some years with numerous detail improvements, mainly to the technology of tensioning the skeins, to incorporate bronze washers on the frames, bronze ratchet wheels and cross-pieces on the end of each skein, cogs and spanners for tightening them, and bronze ratchet pawls to hold the skeins under tension, but also fiddling with the geometry of the frame construction and arms for the working string, collectively known as variations of the ballista, with nomenclature slipping from Greek to Latin with the ascendancy of Rome. Like the catapult, the word ballista takes in a huge range of sizes and uses of weapon, quickly progressing from a weapon designed to break up shield walls to very large stone projectors launching stones against fortifications, the standard projectiles for the latter ranging up to 2.5 talents (65.5 Kg)...

**Cheiroballista** - ...culminating around AD100 with the appearance of the cheiroballista, with an all-metal frame, an arch-shaped sighting device, a larger angle of movement for the arms, all-in-all an elegant and more handy weapon immune to the problem of the frame cracking under the continual compression and release of firing.

**Onager** - Pretty much what you might call the 'Typical movie catapult,' the onager was a rectangular wooden frame powered by a single-skein torsion spring that ran across the base from side to side. The acting arm was inserted in this, and winched down to the rear. Conventionally we think of the action arm as ending in a spoon, but for the most part it would have used a sling. Its forward movement was stopped in the vertical position by a braced and padded bar, raised and set forward of the rope skein. Technologically simpler than a two-skein, the stories vary on how it earned its name ('Wild ass'), some saying because it jumped around like one when fired, while according to others it was due to the sounds made by the single massive rope skein as the operating arm was winched down or the skein tightened.

This transition of nomenclature results in a confused period in the 1st to 4th centuries AD. Per Konstantin Nossov's excellent book 'Ancient and Medieval Siege Engines' “Until at least the mid-1st Century AD the Romans' name for the arrow-firer was catapulta and the Greeks', oxybeles. The smallest arrow-firers were called scorpions. A stone projector was called a ballista by the Romans and lithobolos by the Greeks. Now ballistae fired bolts only on rare occasions, when it was necessary to secure an extraordinary range of fire. By the 4th Century, however, the term ballista, as well as its derivatives - such as arcuballista, carroballista, and manuballista – were already used for an arrow-firer. Ballistae were no longer used for firing stone balls, and the onager became the traditional stone-projector of the period.” (P. 150). He goes on to note that the word 'Onager,' as known from the end of that time, was formerly ALSO known as a scorpion, and from the construction of them it certainly makes sense since onagers have a single arm that flies up vertically when released, stopping in an upright position, in a manner similar to a scorpions tail.

**Trebuchet** – Finally, in the post-Roman world, we come to the last of the great machines. Neither a solid spring nor a torsion-spring weapon, this relies a lever, driven by potential energy stored in the form of gravity. A

very large counterweight is on the short end of the action arm, a proportionally much-smaller projectile is held in a sling on the long end. The falling weight acts through the lever of the action arm to fling the projectile a great distance, if the builder's calculations were correct. Machines of great size, able to fire with impunity from outside the range of any counterweapon save another giant trebuchet, were built and used, and which really were only bested with the advent of gunpowder weapons.

***Oriental lever weapons*** – Although not known, or at least not significantly used, in the West, Eastern chronicles from Arabia to China are replete with field weapons based on a lever action arm, but with muscle power rather than gravity providing the force. In these weapons, a gang of soldiers or technicians each had a rope to pull on signal, the ropes being attached to one end of the action arm, and the projectile spoon or sling being on the other. Often used with incendiary pots in the east, and latterly gunpowder grenade pots, the potential to use stone or iron solid shot to do major harm with them would be limited, but with specialized munitions they proved very easily deployable, simple, and light weight.

***Large solid-spring weapons*** – The most powerful Medieval siege or fortress crossbows seem to be at the limit of development for solid-spring weapons, essentially due to the limitations of materials available in Medieval times. By the time actual steel springs could be made that were large enough to make anything bigger than an extremely strong crossbow prod, gunpowder was on the scene. Designs certainly existed for many types of giant crossbows, einhorns, and such, in Leonardo's notebooks but the materials of the time were not up to the task, and by Leonardo's time such machines were already obsolescent and not worth the cost of attempting such a complex constructions even if material science of the day could have supported the build. The einhorn ('One-horn'), in particular, is in a class of 'Machines that probably never really existed.' It was basically a throwing weapon not unlike an onager, but based on the flexion of a large solid spring that was also the action arm. There is really no material other than extremely good spring steel, perfectly heat-treated, that would stand up to the repeated extreme deflections that such a weapon would have to endure, and any culture that could produce that would be able to make much more sophisticated and destructive weapons with much less trouble. In the class of 'Probably never existed' also go the illustrations of what I broadly refer to as "Arrow spankers." These are concept weapons that hold one or many arrows, or darts, parallel in a frame, while a resilient board (The spring) is winched down behind them, and when released, smacks them all hard on the nock end, theoretically propelling them downrange. Aside from nagging questions about whether the arrows could survive the slightly asymmetric impact of a bent board, I have trouble seeing how it could impart velocity in in the same ballpark as a conventional bow or crossbow, as well as issues of specific impulse compared to a bowstring.

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# The Coronation of Ashir and Ashland A Pictorial

By  
Lady Dulcibella de Chateaurien



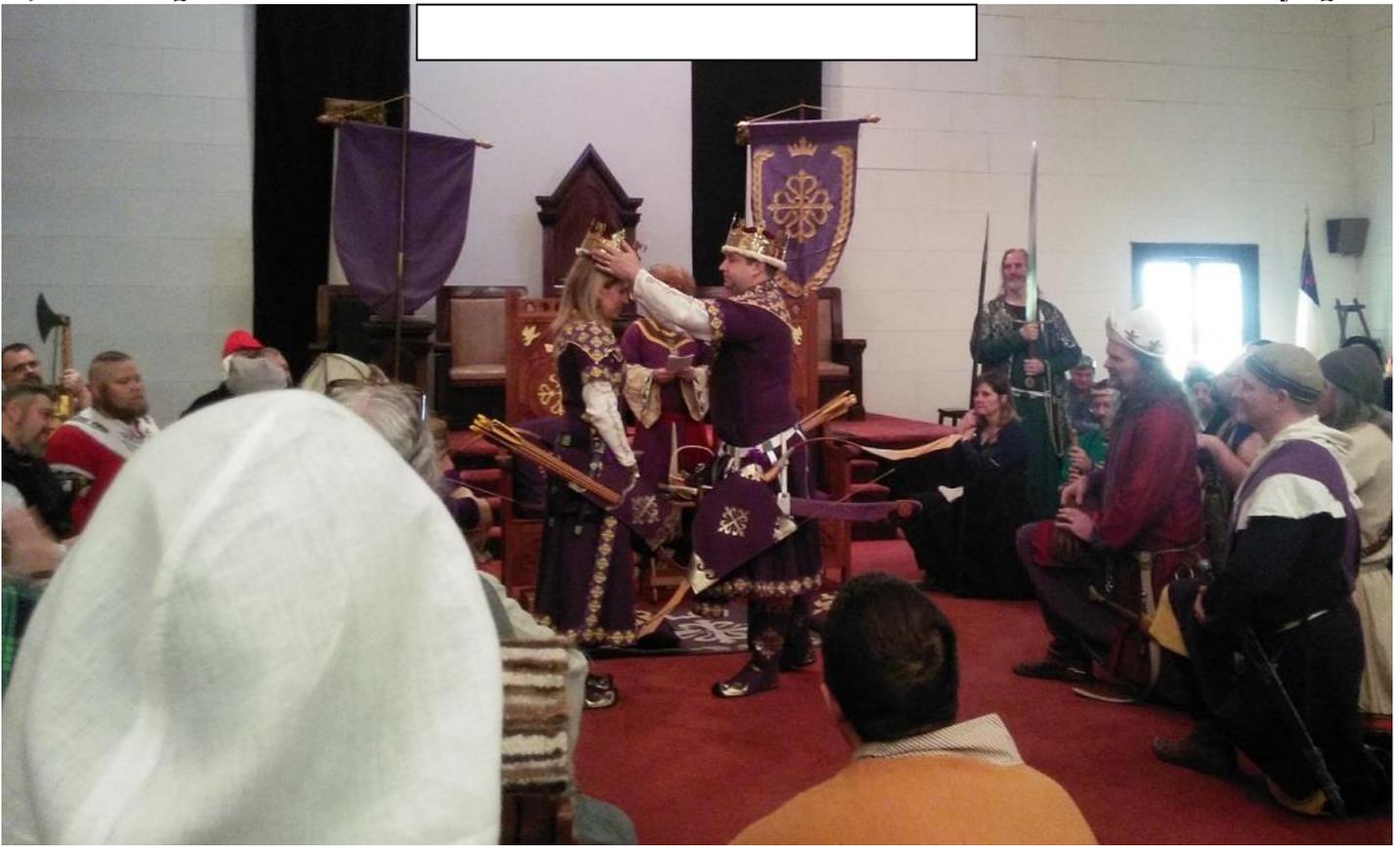
The king and queen  
step down to make  
way for their heirs.  
The Falcon Thrones  
stand empty.

# Prince Ashir Arrives to Claim the Throne.



# Princess Ashland is Summoned to Accept her Crown





HL Paul Swears Fealty Along with the Other Great Officers



## Shire Officers

### SENESCHAL

Lady Catin of Edington. *Cathy Glueck*;  
[glueckc@yahoo.com](mailto:glueckc@yahoo.com)

### HERALD

Crespin de Laon. *Christopher Cureton*; PO box 1380;  
Rolla, MO 65401. 573-201-8060.

### KNIGHTS MARSHAL

HL Paul Adler. *Vince Zahnle*; 11413 Upton Rd; Plato, MO  
65552. 417-967-1034 [vince.zahnle@gmail.com](mailto:vince.zahnle@gmail.com) No texts  
please.

### MINISTER OF ARTS & SCIENCES

Baron John Tristram. *John May*. 417-458-1046  
[jontristram@yahoo.com](mailto:jontristram@yahoo.com)

### EXCHEQUER

Lady Disa of Calanais Nuadh. *Denise Howard*.  
[disadenise@yahoo.com](mailto:disadenise@yahoo.com)

### CHRONICLER

Lady Dulcibella de Chateaurien. *Lucy Zahnle*; 11413  
Upton Road; Plato, MO 65552. 417-967-1034  
[lezahnle@gmail.com](mailto:lezahnle@gmail.com) No texts please.

### CHATELAINE

Open

### WEBMINISTER

Lady Dulcibella de Chateaurien. *Lucy Zahnle*; 11413  
Upton Road; Plato, MO 65552. 417-967-1034  
[lezahnle@gmail.com](mailto:lezahnle@gmail.com) No texts please.

### ARCHERY MARSHAL

HL Thomas Fleischacker, *Thomas Glueck*  
[glueckc@yahoo.com](mailto:glueckc@yahoo.com)

Website: <http://www.shireofcalanaisnuadh.org>

Group List: <http://groups.yahoo.com/group/calanaisnuadh/>

FaceBook: <https://www.facebook.com/ShireOfCalanaisNuadh>

<https://www.facebook.com/groups/ShireCalanaisNuadh/>

**Shire Calendar – February, 2017**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
12 No Archery Practice.	13 6:45 PM Weekly Meeting Project Night St. Robert Municipal Center, St. Robert, MO.	14	15	16	17	18 Winter War Maneuvers, Lincoln, NE.
19 No Archery Practice	20 6:45 PM Weekly Meeting Project Night St. Robert Municipal Center, St. Robert, MO	21	22	23	24	25 Chieftains, St. Louis, MO
26 Archery Practice 2 PM Beaver Creek Conservation Area Rolla, MO.	27 6:45 PM Weekly Meeting A & S Class - TBD St. Robert Municipal Center, St. Robert, MO	28				

**Shire Calendar – March, 2017**

			1	2	3	4
5 Archery Practice (This may change)	6 6:45 PM Weekly Meeting Project Night St. Robert Municipal Center, St. Robert, MO	7	8	9	10	11 Gulf Wars, Lumberton, MS, March 11-19
12 No Archery Practice because of Gulf Wars	13 6:45 PM No Weekly Meeting Because of Gulf Wars (May Change)	14	15	16	17	18

**Driving Directions:**

**Archery Practice - Beaver Creek Conservation Area:** No Crossbows. No Archery in freezing temperatures (32° F). From Rolla, take Highway 63 south for several miles. The range gate will be on your left, immediately across the highway from the VFW post. Drive through the gate to the top of the hill, park and take the line!

**Shire Meetings - St Robert Municipal Center: Driving directions:** If you are traveling south on Missouri Ave. after coming into St. Robert on Exit 161, turn left at the first stoplight onto Eastlawn Ave. (look for the Arby's). After passing Paul's Furniture and the Dollar Store, take the first right to turn into the parking lot of the municipal center.

**Room Directions:** Our meeting space is Room H of the St. Robert Municipal Center (aka City Hall). When you enter the building from the main doors, walk down the central atrium toward the police station. Take the first hallway on your right, immediately after the VA office, and follow it to the end. This is the same room that is used for driver license testing during the week.

**Fighter Practice:** Held in conjunction with archery practice unless otherwise announced via Facebook or shire Yahoo email list.

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Her Ladyship  
Nest's Scroll and  
Medallion for her  
Silver Hammer  
Award!

Photo by Edie G. Hayes (SKA HL Nest ffynnon) ©2017 Used with permission.