Science in Sci-Fi, Fact in Fantasy

Science in Sci-Fi, Fact in Fantasy is a blog series for authors and fans of speculative fiction. Just as science fiction often has roots in hard sciences – physics, astronomy, genetic engineering, microbiology – fantasy world-building relies on everything from economics to military strategy to animal husbandry.

Every week, we discuss elements of sci-fi or fantasy with an expert in a relevant topic area. We debunk the myths, correct the misconceptions, and offer advice on getting the details right.
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It’s hard to put a number on how many books I’ve read that feature characters in the woods. Sometimes they’re fleeing, sometimes chasing, sometimes just looking for something to eat.

As someone who spends a lot of time in the woods, I should tell you that most authors get it wrong. Here are ten realities about the woods that every writer should know.

1. A forest has more than just trees

When writing about the woods, many authors focus on just one thing: the type of trees and how many there are. In a mature deciduous forest, there are typically at least four layers of plants:

The layers of woods

The top canopy, formed by the tall trees, begins 20 or 30 feet overhead and goes much higher.

- Below that you’ll often have a second canopy from saplings and smaller trees, like dogwoods and cedars.
- The third layer, called the understory, comprises shrubs and bushes, like honeysuckle.
Lastly, there’s the ground cover of forest herbs: weeds, wildflowers, and other things that grow quickly in spring before the deciduous trees get their leaves. All of this must be negotiated by someone on the ground. Which leads me to my next point.

2. Running often isn’t possible.

Nothing throws me out of a book faster than a character running (or worse, galloping) full-tilt through a dense forest. If you only had the big tree trunks to worry about, you’d be fine. It’s the understory that’s the problem: dense, shoulder high thickets are almost impossible to traverse quickly. And if it’s a patch of evergreens, forget it. They’re hard to even walk through, because they can grow so closely together with branches that hang almost to the ground.

Running or riding a horse at top speed is also pretty much begging for a broken ankle. Holes, stumps, and fallen logs all lurk beneath a deceptively placid layer of fallen leaves.

3. It’s hard to move quietly

Having stalked many animals in the woods, I can tell you that most of them are pretty quiet. They have to be, in order to survive. The loudest thing in the woods by far is a human being. Most hunters sneak into the woods well before the animals are moving about, and they find a place to sit very, very still. We don’t walk around, because it’s nearly impossible to sneak up on game.

What this means for any kind of a forest chase is that a person running through the woods would be easy to hear coming from a long way off, and easy to follow, too. There’s one time when a person can move through the forest both quietly and at a decent speed: when the ground is wet, either from heavy dew or
recent rainfall. You still have to avoid snapping twigs and kicking branches, but otherwise you can find stealth.

4. **Visibility is generally poor**

   The visibility in a forest depends on a few factors, the most important of which is the season. Visibility is poorest in late spring and summer. Because of the undergrowth and the greenery, you usually won’t be able to see more than 20 or 30 yards in any direction. Also, someone on the ground usually can’t see the sky, the clouds, or the stars at night because of the top canopy. So yeah, that whole navigating-by-the-stars thing won’t happen in a dense forest.

   Visibility is strikingly different after the leaves fall. The woods are a very different place, then. You might be able to see 50 or 100 yards, depending on the terrain. Snow on the ground makes a difference, too: the contrast makes animals and people stand out at a distance, especially when they’re moving.

   Ironically, better visibility doesn’t always help the hunter, because it works just as well for the animals.

5. **Getting lost is easy**

   It is very, very easy to become disoriented in the forest. Here are some of the reasons:

   - **You don’t walk in a straight line.** There are thickets and fallen trees to skirt around, ridges to cross, and game trails to follow.
   - **You can’t count on the sun or moon,** because they’re often hard to see through the canopy or when it’s cloudy.
   - **Deep in the woods, everything starts to look the same.** You think you know where you are, but you might be wrong.
Even when I’m hunting an area I know well, I never enter the woods without my GPS and an extra set of batteries for it.

6. The best way to hide

Humans (as well as predators and many bird species) have excellent perceptive vision, meaning that they can easily spot movement.

Thus, the best way for anyone or anything to hide in the forest is to keep absolutely still. Movement, even swatting a mosquito (which are voracious in the forest, by the way), will give you away.

Wearing the right colors helps, too. Blue, red, and bright orange are colors you won’t often see in the woods, so they stand out like neon signs. A hunter in full camouflage, sitting still with his back to something that breaks up his outline (like a wide tree) is virtually invisible. That same hunter walking back to the truck is easy to spot.

If I were fleeing someone in the woods, I’d go to ground as quickly as possible and lay still.

7. The truth about tracking

The concept of “tracking people” in the woods in fantasy literature has always bothered me. You know, the old “Ah-ha! This twig is snapped here, so they went in this direction.” Most of the time, unless someone is in view, you’ll have little idea which way they went. The ground is hard and strewn with fallen leaves. Twenty guys might have walked through the same stretch of woods half an hour before me, and I wouldn’t be able to tell.

Following someone on a trail will help, though, since it may have been worn down to mud that can hold a footprint. Other things that would help:
If the quarry is bleeding. Blood stands out on the forest floor, and falls in a pattern that usually indicates direction.

If there’s snow on the ground. Nothing reveals tracks better than half an inch or more of snow on the ground. Not only are all tracks visible, but you can tell old ones from new ones.

The two above things combined — tracking someone/something that’s bleeding through snow-covered woods — represents the base-case scenario. Of course, clever quarry might think of ways to turn that against would-be pursuers.

I have tracked wounded deer through the woods on a few occasions. When fleeing danger, animals (including humans) have certain tendencies. They prefer to flee downhill, and via the path of least resistance. They run largely in one direction. And they avoid open areas whenever possible.

8. **Expect strange noises**

Often when I’m sitting in the woods, there’s not much to look at (even with my hunting binoculars), so I use my ears instead. Sound usually travels farther than I can see. There are many familiar noises: crows, woodpeckers, crickets, that sort of thing. And let me tell you, I have heard some strange noises. One that I hear somewhat often is a squeaky-squeaky kind of creaking noise; I suspect it’s some kind of bird. Other noises are less common, yet more puzzling.

Here’s a good example. Once while hunting on a wooded island along the river, I heard this whooshing sound. It would happen once every 15 or 20 minutes. It almost sounded like a bellows, but I was 5 miles from any civilization. Then I came to an open patch of sky, and I saw what it was: a flock of small birds, flying in unison. I think they were teal, and they flew like little stunt planes. The whooshing sound happened when they all made
a sharp turn at the same time. I wouldn’t have guessed that in a hundred years.

Other strange noises I’ve heard remain mysteries. Once I heard something that sounded like a baby crying in long, plaintive wails. That one still haunts me.

9. The woods are beautiful, if you’re into that sort of thing

Despite all the bugs and tripping hazards and briar patches (and poison ivy!), the woods tend to be a peaceful place. I might spend eight hours without seeing another person. Away from the rush and noise of modern life. Time passes more slowly. Twilight seems to last longer. The tranquility of the deep woods, with the sigh of wind through the treetops, is something we outdoorsmen (and outdoorswomen) cherish.

10. There are exceptions to challenges of the woods

Obviously, none of these problems (stealth, visibility, and getting lost) apply to elvenkind. Or the Dúnedain.
The Expert: Karlie Hart

I met Karlie when I joined as a co-blogger on Trouble the Write Way, a blog about writing craft. I knew I had to befriend her right away, because she knows about horses.

Karlie has been a rancher/horse trainer for several years, growing everything from cows and chickens to hay and tomatoes down in Mississippi. Currently, she’s working on getting a degree in English and Creative Writing, with full intent to pursue a new career in publishing. She’s written six novels to date and hopes to one day see them in print.

Today, Karlie’s going to help us get the facts straight on those sturdy animals that pervade fantasy novels: horses.

What things do authors get wrong about horses?

First, up, here are some misconceptions about horses that have come up in books.

Misconception #1. Shin splints are serious

This is such a little thing, but it’s a dead giveaway that the author has spent no extensive time around horses. I read a novel in which the horse “came up lame” from a shin splint, and the character told the boy to stable him for a month or the leg would be permanently damaged.
Shin splints are harmless “stress knots” that show up on a horse’s front legs. If the splint is in the joint, that would cause him problems, but I’ve never seen one like that. Any horse that is worked/ridden (say, a roping horse, or a trail horse that covers rough ground) to any extent will develop them. In fact, the only horses I’ve encountered without them were show horses, who were only worked very lightly in preparation for the ring.

**Misconception #2. Breaking a horse to saddle takes months**

It should never take months to break a horse to saddle. Like, ever. If a trainer tells you that, he’s taking your money. The longest it has taken us to gentle a horse is two weeks. Why? We don’t “break” them. We use the old method of trust and respect, built on a foundation of solid training.

**Misconception #3: Mares are “moody”**

Mares are not moodier than geldings, any more than geldings are moodier than mares. I run into this quite a bit, and it is absolutely not true, and crazy how many people believe that. Stallions are unsafe and unpredictable; you can count on that. But really, there is no basis to the other.

**Misconception #4: Horses scream when injured**

Here’s something I straightened out for Dan. Horses are fight or flight animals. Yes, they can scream, but I’ve never heard a horse in pain make that sound. I’ve seen mares struggling to give birth, horses tangled in barbed wire, and other awful situations, and they might emit a long, drawn-out groan, but if they’re trapped or compromised in any way, their energy is going
to be spent trying to get away. They can’t handle being helpless, it’s ingrained into them.

**Getting the Details Right**
Here are some details about horses that an author could get right, to impress me.

1. **Give them shin splints.**
   As I mentioned above, most horses will get them, but they’re harmless.

2. **Forget about loyalty.**
   Horses are not inherently loyal to their owners, especially in the face of danger. Yes, there are some horses that will stand between their owner and a predator. But chances are you won’t own one in your lifetime. I know the horse has been romanticized, but when it comes down to it, they’re looking out for themselves. So if they would have the horse balk, perhaps putting the owner in greater danger, instead of bravely charging out among the swords/spears/bayonets....

3. **Keep whinnies to a minimum**
   Horses are actually relatively quiet animals; they don’t communicate with the snorts, whinnies, squeals etc. If you sit down and just watch a group of horses, they do all their “talking” with body language. Usually, they eat/drink in peace, unless one of them steps out of line.

4. **Even horses need a nap sometimes**
   Horses don’t only sleep standing up – they get most of their rest this way, but they do need to enter REM sleep, just like
humans do. They can’t achieve that state while standing. A horse will only need to lie down for a couple hours every four to five days to ensure they are getting the minimum of REM sleep they need. Also, they rest easier in groups than when they are alone because of the inherent predator instincts they possess.
On Dothraki and House Elves: Developing Fantasy Cultures

September 4, 2014

The Expert: Hannah Emery

Hannah Emery is a sociologist by training (PhD from UC Berkeley last year). Her professional specialties include culture, education, and identity; she wrote her dissertation on the social construction of identity, looking at how parents choose names for their children.

In addition to the general Intro to Sociology course, she’s also taught courses on identity and on family.

Hannah is currently teaching part-time and writing a series of fantasy novels.

She blogs at sociologistnovelist.wordpress.com, mainly about writing and the intersection of writing and social science.

Why Developing “A Fantasy Culture” Won’t Cut It

Can you describe your fantasy story’s dominant culture in one sentence?

That’s where many of us start when we’re writing, especially those who really love to worldbuild. We hit on a concept for a race of catpeople, or think about how people would be different if they’d evolved underwater, or decide to tweak how human reproduction works. Concepts like these are fantastic starting
places: with a little research and creativity, they can be spun pretty quickly into a full-fledged culture, with elaborate practices, values, and stories and beliefs about how the world works. And you can stop there. A lot of authors do, including some whose books are runaway best-sellers. But if you want your story to portray a realistic society, building “the culture” won’t be enough, for three reasons: cultural drift, cultural exchange, and deviance. Let’s unpack these a little.

**Cultural Drift**

How old is your primary culture? And how much territory does it cover?

There’s a lot of talk both inside and outside the United States about “American culture,” You know, the culture of Big Macs and organic local farmers’ markets, of abstinence pledges and the reality show Sixteen and Pregnant, of – you get the idea. Even in “the information age,” the US still has regional cultures. If you’re familiar with those cultures, you might make assumptions about someone from the Bay Area, or the Bible Belt, or Brooklyn, but you’d likely realize there’s not much you can assume about someone from “America.” The country’s just too big.

The same goes for cultural change over time. Even in a relatively young country like the US, there have been dramatic cultural changes since its founding, and modern people get into positively brutal arguments about what the original culture was (just ask someone with an opinion on the issue what “separation of church and state” means).

Over time and distance, the Vulgar Latin spoken in the Roman Empire fragmented into the very-different Romance languages. Culture fragments, too, and it also changes in response
to local conditions. The American Revolution changed its people’s culture dramatically. So did the slave trade. So did the car.

Failing to take cultural drift into account seems to be particularly common when you’re developing non-human cultures (centaurs are noble, dwarves are gruff, elves are arrogant, you know the drill). **One exercise to help you get around this is to think about which of the cultural traits you’ve developed are actually rooted in biology**: those are the ones most likely to be universal across cultures.

For instance, almost all human children are raised in family groups; almost all humans subsist on some combination of plant matter and animal protein; almost all humans will have sexual partners at some point in their adult life. But think how many variations exist on those themes if you widen the scope to all human cultures.

**Cultural Exchange**

Think fast: where did tomatoes originate?

If you guessed Italy, I can’t blame you. Tomato sauces and bruschetta are so strongly associated with Italian food now that it can be hard to believe there were no tomatoes in Europe until the sixteenth century. They originated in southern Mexico, and came to Europe with returning Spanish explorers. Same thing with chili peppers, brought first to Europe and then to Asia from the “New World.” People traveled, they saw new things, and they adopted those things as their own.

Intelligent creatures are curious. If people from your primary culture have contact with other cultures, whether through war, alliance, or just casual encounters, some parts of those other cultures will trickle home with them. Some American GIs who served in Vietnam came home with a new taste for Southeast
Asian cuisine; some sub-Saharan Africans who heard the preaching of European missionaries decided this Jesus stuff might be worth exploring.

Food and religion are particularly good examples of cultural exchange, because they’re pretty portable and fairly resistant to extinction. When people travel to a new country, they bring their cuisine and their faith along, and even when immigrants assimilate, food and faith tend to persist longer than other things. But the longer an export is immersed in a new culture, the further it’s likely to drift from its original source material.

Christianity in Africa looks quite different from Christianity in Europe; “Chinese food” in the United States is very different from Cantonese or Szechuan cuisine. Blame cultural drift again, along with syncretism (a term most commonly applied to religion): combining new cultural elements with ones that are already working well.

East and Southeast Asia are notorious for this, with many people’s religious practices incorporating elements of Buddhism, Daoism, Confucianism and local indigenous traditions without the practitioners seeing any contradiction.

Cultural exchange is particularly common where two cultures bump up against each other often. This is why “ethnic” food is most prevalent in big cities that are common immigrant destinations, and why there are more Mexican restaurants in the southwestern US (i.e., close to Mexico) than in New England. If your story’s set in a border town, it will almost by definition not be monocultural.

**When Two Cultures Meet**

Finally, of course, there’s cultural exchange in the most direct sense of the word. When two human cultures first meet,
there are two things you can almost always count on: they’ll try to kill each other, and they’ll make babies. Even if there are taboos against intercultural sexual relations – even if it’s punishable by death – it’ll still happen. And the children who come from those unions will have to be categorized within the societies who could potentially claim them, and decide for themselves what cultural space they’re going to occupy.

Which brings me to my final bullet point. I suspect that right now, someone reading this is preparing to protest that your fantasy culture is the exception, that your cultural authorities (king, warlord, high priests, whoever) maintain a policy of strict isolationism, so there’s no opportunities for cultural exchange, and they’re immortal, so there’s limited opportunity for cultural drift because the story coming from the top never changes. To you, I say that even in the most authoritarian societies, there will always be the crazy ones.

**Deviance**

What was US culture like in the 1950s? (Hint: This is a trick question.)

If you took early American TV as your guide, you could easily believe the America of the ‘50s was a land of capitalism-loving, comfortably middle-class families, with stay-at-home moms and breadwinning dads. But, of course, some Americans still got divorced in the ‘50s; some were in same-sex relationships; some were poor; some were Communists. The dominant culture’s social norms may have pointed people toward the *Leave it to Beaver* ideal, but the reality was a little different.

Whatever norms, beliefs and values your society has, there will be people who stray from them. People who don’t believe God created the universe, or don’t believe that the Big Bang did. People
who sever ties with their family of origin, or who live with their parents until they’re forty. Straying from the mainstream – whatever that mainstream might be – is what sociologists call deviance.

**Characters Breaking the Norm**

People tend to think of the term deviance as referring to illegal and/or immoral actions, and that’s certainly part of the picture. But there are also deviant acts that violate norms rather than laws or morals, like sitting down right next to someone on the bus when there are empty seats available elsewhere. You won’t get arrested; you may not even get a dirty look; but you’ll almost certainly make the other person uncomfortable.

And there’s another type of deviance even milder than norm-breaking, people who just do things a little differently. In 2014, in much of the world, not having a cell phone makes you deviant; so does having twelve children. Ditto skydiving, or having a tarantula for a pet.

**Your society will have all these forms of deviance.** There will be people who commit crimes (actions that a government deems undesirable for one reason or another); there will be people who do immoral things (often actions that a religious authority deems undesirable); and there will be people who do weird things, and think outside the box.

The motivations for these actions could be anything you can imagine. What if there was a Dothraki in George RR Martin’s *A Song of Ice and Fire* who was allergic to horses? What if there was a Hogwarts house elf who had a vision from the gods and started preaching that the house elves needed to go join Voldemort’s cause, or that they needed to use their magic destroy the humans?
The people in your world will be born into a culture, and that culture will shape their thoughts and beliefs and actions. But no thinking person can conform completely to every aspect of their culture, no matter how constrictive that culture is. You’ll always have variability, and that’s something to consider when developing fantasy cultures.

This might all sound like a lot of work, and I’m certainly not suggesting you come up with a hundred incarnations of every culture that could potentially appear in your story. But for the main cultures, I’d suggest it’s worth thinking about these things. Because the more nuance you can put in your cultures, the more realistic they’ll feel to your readers – and who knows, you may even find opportunities for new stories! The messianic house elf seems like it has potential to me.
Medieval versus Modern Archery

September 18, 2014

About the Expert
I’m serving as the expert today, in honor of something very special that happened this week: the opening of bowhunting season in Missouri. I’ve hunted with bow and arrow for 17 years.

Every September, I disappear into the woods for (seemingly) weeks at a time in pursuit of two formidable animals: the elusive whitetail deer, and the wily wild turkey.

Medieval versus Modern Archery

The bow and arrow is one of the oldest projectile weapons in history, dating back as far as 30,000 years B.C.E. It’s been around forever — particularly for hunting — but the bow’s use in warfare rose to prominence during the Middle Ages. I’m talking about the English longbow, also called the Welsh longbow. Its first recorded use in Britain was around 633 AD, when an arrow shot by a Welsh longbow killed Edwin, the son of the king of Northumberland.

Advantages of the Longbow

The crossbow was the main rival for the longbow in the Middle Ages, and popular because it required minimal training. Yet it could only deliver 1-2 bolts per minute and had an effective range of 20-40 yards, whereas a longbow could deliver 6
arrows per minute at a range of 300-400 yards. They were also relatively easy to make; modern bowyers can build a longbow in about 10-20 hours.

**Bows in Battle**

In the Middle Ages, the longbow saw use in various civil wars for which the period was rather famous. They also played a key role in several battles of the Hundred Years' War. One of these was the **Battle of Crécy**, which took place in northern France on August 26, 1346. On one side were the exhausted French forces, whose crossbowmen had just endured a long march in the rain that damaged many of their weapons. On the other side were the English, who'd chosen the field of battle, rested, and kept their bowstrings dry. The French tried a crossbow volley which had no effect.

How did the English respond? Froissart, the renowned French chronicler, tells it this way:

“*Les archers anglois découvrent leurs arcs, qu’ils avoient tenus dans leur étui pendant la pluie.*”

Translation: the English archers uncovered their bows, which they had kept in their case during the rain (hey, I knew that French degree would come in handy someday). And you don’t need Froissart to know what happened next. There’s even a nice illustration of it from this timely bit of art.

Wet crossbows were no match for the Welsh longbows, which could shoot 400 yards and deliver 5-6 arrows per minute. The French forces were soon routed and took thousands of casualties.

**Longbows versus Chain Mail and Plate Armor**
An interesting question that comes up, both in history and in fantasy novels, is whether longbows could put an arrow through armor or chain mail. A bodkin arrow, whose tip has a stronger, narrower point (essentially a squared, spear-like shape), was probably developed for this purpose. Compared to the broadhead, which had a wider cutting radius, bodkins were more likely to punch through armored enemies.

Though it’s a matter of debate among historians, many believe a bodkin would have difficulty penetrating solid armor, especially high-quality plate armor covered with a gambeson (a sort of cloth worn on the outside to protect against projectiles). Against non-mithril chain mail, however, a longbow with bodkin arrows was likely very deadly. Especially at close range (<50 yards).

**Wreck of the Mary Rose**

Very few longbows from antiquity survive. Unlike swords, armor, shields, and other weapons, bows wore out and were replaced instead of handed down from one generation to the next. Much of what we know about English longbows comes from the Mary Rose, a warship from the navy of King Henry VIII that sank in 1545.

When rediscovered in the 1970’s, the wreck was like a Tudor-era time capsule. Among the countless historical artifacts were about 175 longbows and 4,000 arrows, the analysis of which rewrote our understanding of English longbows in the Middle Ages. It’s what I use for the comparison below.

**Modern Archery**

Firearms eventually replaced the bow and arrow in warfare, but archery remains popular today for sport and recreation. I
know more about the bowhunting side, where bows, arrows, and related equipment are modern marvels.

According to the U.S. Fish and Wildlife Service, there are ~3 million bowhunters in the United States, and they spend $935 million each year on bows, arrows, and other archery equipment. Most hunters prefer the compound bow, for reasons I’ll explain below. How does their modern equipment compare to that of King Henry VIII’s archers? Let’s find out.

**Longbow Versus Compound Bow**

Here I’ll compare some of the important features of longbows from the Mary Rose to a typical modern compound bow used for hunting.

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<thead>
<tr>
<th>Feature</th>
<th>English Longbow</th>
<th>Compound Bow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length:</td>
<td>72 inches</td>
<td>32 inches</td>
</tr>
<tr>
<td>Limb material:</td>
<td>Wood: Yew, ash, or elm</td>
<td>Metal alloys (Al) or carbon fiber</td>
</tr>
<tr>
<td>Draw Length and Weight:</td>
<td>30 inches, 150 pounds</td>
<td>25-30”, 50-70 pounds</td>
</tr>
<tr>
<td>String material:</td>
<td>Hemp, flax, or silk</td>
<td>Polyester</td>
</tr>
<tr>
<td>Range:</td>
<td>350-400 yards</td>
<td>500 yards*</td>
</tr>
<tr>
<td>Arrows:</td>
<td>Poplar, ash, beech, or hazel</td>
<td>Aluminum or carbon fiber</td>
</tr>
</tbody>
</table>

*The effective range for hunting is around 25-50 yards. Most deer are taken from about 30 yards or less.*
One thing you’ll notice is that the longbow was considerably larger (6 feet) and had much higher draw weights. My own bow has a draw weight of 62 pounds; at times, I’ve had trouble drawing it. There’s also the fact that hunters in North America don’t really need more than a 60 pound draw for any game they might encounter. As I note above, most of us prefer a “flat-shooting” compound and practice accuracy at 20-40 yards.

**Flatbows and Recurve Bows**

Other kinds of non-compound bows have evolved over history. The cross-section of an English longbow would be a “D” shape: flat on the side that faced the archer, and rounded on the other side. A flatbow is a different design with flat, relatively wide limbs that have a rectangular cross-section. It’s superior to the longbow because it the flat surface spreads the stress more evenly. It generally takes longer to construct a flatbow than a longbow, but a wider variety of timbers — such as elm, maple, and hickory — can be used.

The recurve bow is yet another design, but one in which the tips of the bow curve away from the archer when strung. This also means that the string rests against the limb of the bow at the top and bottom. A recurve stores more energy and delivers it more efficiently than straight bows, which means that they can be shorter in size, but with the same punch. Horse bows, which had to be shorter so that they could be shot by horseback, were often recurves for this reason.

**Bow and Arrow Myths in Fiction**

Because I like to debunk common myths/mistakes in this series, I thought I’d touch on a few things we see — especially in the fantasy genre — that are not really accurate.
1. Learning to shoot a bow is easy
   Longbows in particular were difficult to master. King Henry III made the following declaration in 1363 to encourage all Englishmen to practice with the bow.
   “Whereas the people of our realm, rich and poor alike, were accustomed formerly in their games to practise archery – whence by God’s help, it is well known that high honour and profit came to our realm, and no small advantage to ourselves in our warlike enterprises... that every man in the same country, if he be able-bodied, shall, upon holidays, make use, in his games, of bows and arrows... and so learn and practise archery.”

2. Bows shoot arrows flat
   An arrow shot from a bow falls with gravity, and the less powerful the bow, the greater the effect. With a modern compound (60 pound draw), I’d estimate the arrow drops 6-10 inches every ten yards.
   With historical bows, this also meant that archers “aimed up” to account for the rainbow-shaped flight path. If you don’t believe me, go watch a longbow or recurve shooter at an archery range sometime. It’s scary.

3. Skinny boys and girls can shoot longbows
   Sorry, Katniss, but shooting a longbow that could kill a man at distance, or punch through armor, required considerable upper body strength. We’re talking 80 to 120 pounds of force. I myself probably couldn’t draw one. I certainly couldn’t shoot it repeatedly. The skeletons of English longbowmen showed visible adaptations (enlarged left arms and bone spurs on the right fingers) from prolonged longbow use.
Smaller bows with lighter draw weights (especially recurves) are more realistic. Many compound bow manufacturers now make lighter models specifically for use in the growing female-bowhunter demographic. Sometimes in hot pink.

4. Ten arrows a minute is reasonable
Surviving documents and historical accounts of English longbowmen suggest they shot, at most, around 6 arrows per minute. It would be wasteful to do otherwise, and most archers were supplied with 60-70 arrows before a battle. Unless your character is an elf named Legolas, it’s wise to put a cap on the rate and number of arrows he/she can shoot.

Compound Bow Advantages
The reason that compound bows are so popular is the draw curve: the strength required to pull back an and hold an arrow. With a longbow, that draw curve is essentially linear: it takes more strength to hold a bow the farther you draw it back. That’s why some of those Katniss-like moments are a little unrealistic. Longbows are hardest to hold when you’re fully drawn, so there’s not a lot of time for aiming and releasing. A strong man would have trouble holding a longbow at full draw for more than a second.

The compound bow’s design offers a different draw curve: it’s hard at first, but as the pulleys (the gear-shaped things at each tip) turn over, a compound requires less strength to draw. Holding an arrow at full draw is much easier. I’ll routinely hold at full draw for 5-10 seconds to take steady aim at the target. Modern bows also have something called a peep sight: a small donut-shaped plastic ring, located in the string (near where you nock the arrow). At full draw, you look through the hole at
sighting pins on the bow itself. You set the pins at different heights for different ranges (20, 30, and 40 yards). Thus, the peep sight helps with both centering and distance.

Modern bows have other luxuries, too: stabilizers to make them easier to hold, shock absorbers to preserve the limbs, fancy arrow rests, and limb savers. Most hunters now use carbon arrows, which are narrow and strong, but provide the flex required to counter the archer’s paradox. They might use field points, fixed-blade broadheads, mechanical broadheads, or even blunted arrowheads for small game.

Despite all of the technological advances, the fundamentals of the bow and arrow haven’t changed in thousands of years. Draw, aim, shoot. It’s challenging to hunt with a bow instead of a rifle, but millions of us do anyway. I like the challenge. And when I carry my bow into the woods, it’s like taking thousands of years of history with me.
A Short History Of Warfare In The Western World
November 12, 2014

“Morning of the Battle of Agincourt”,
painted by Sir John Gilbert.

About the Expert
Jerry Quinn is a classical actor and history buff with a special interest in 10th-12th century Normandy. He’s spent a dozen years performing at Renaissance Faire, where he’s learned both how to pick up a prostitute in Shakespearean English and when it’s okay to let go of obsessive historical accuracy for the sake of making sense to the audience.

He’s also the editorial administrator of the Ubergroup on scribophile.com, the “most productive writer’s group on the internet,” where he herds a little over 150 cats writers and preaches the dramatic principles of Lajos Egri.

A Comically Short History Of Warfare In The Western World

Fantasy authors often buck the idea that technology in their world should progress the same way real history did. Technological advances in warfare, however, are a lot like biological evolution: the result of trying and failing a whole lot of times before something actually works. Tiny fencing swords were not used against knights in plate armour because, plain and
simple, they wouldn’t have worked. If you don’t believe me, take the most delicate fish knife in your kitchen and attempt to hack open a corrugated-steel loading-dock door.

Sure, a tiny fencing sword could have been made by the same level of forging technology as a heavy broadsword, and yes, some early ones did exist. They weren’t widely useful, however—outside of duelling with another unarmed layman—so they weren’t made in quantity for the battlefield. Why waste the time and money making a tool that doesn’t work? Nature and economics both refuse to support illogical solutions. Not until the proliferation of efficient firearms made heavy armour obsolete (By the same force of necessity: why weigh yourself down with something that won’t actually protect you anymore?) was it realistic to try to poke your opponent with something fast and light.

Over the next few months, I’ll be trying to help fantasy authors understand the underlying logic of why certain things came after others in actual history. Yes, fantasy by definition means you can do whatever you want, but if “whatever you want” happens to include the physics, chemistry, and biology of Earth—if your fantasy world has 9.8 m/s/s gravity, a 24-hour diurnal cycle, four temperate seasons, liquid water, mercury that’s poisonous, gold that’s valuable, and a whole bunch of recognisable four-limbed megafauna like horses, cows, and sheep—you need to understand the basic relationship between the limitations of that world and what the bipedal primates running around on it can do with it.

Since a large portion of fantasy takes place in an analogue of the western world sometime in the last 2000 years, today we’ll begin with an overview of that, starting with:

**Organisation and deep pockets**
The very early Roman Republic—from about the 7th-4th century BCE—followed the example of a Greek phalanx: primarily infantry, long spears, interlocking shields. In the 3rd century BCE, they really started getting organised: mobile, disciplined, and constantly rotating to allow fresh troops into battle. Weapons and armour were quite light. The main advantage was manoeuvrability, good funding, and discipline that came with soldiering as a full-time profession. The Roman army built roads to get where they were going easily. They managed food and supplies carefully. From the 1st century BCE onwards, Roman armies even brought along doctors and staged field hospitals.

**The keywords of Roman-era infantry combat:** light, fast, organised, aggressive. They took what everyone already knew how to do and did it bigger, faster, harder.

**Smarter politics and copying your neighbours**

Rome had always assimilated conquered ‘barbarian’ peoples into its army, but as the empire over-expanded, over-spent, and grew corrupt, administrative and support structure declined. The fiction that the chaotic, unrelated tribal mercenaries were paid Roman allies continued into the 5th century, but in reality, the organisation that had made Rome was long gone.

After the collapse of Rome, Byzantium continued to use fundamentally Roman structure, but were clever enough to improve upon it. Rather than allowing citizens to avoid military service — which required hiring mercenaries of questionable quality and loyalty — they implemented universal conscription. The Byzantines were also quick to adapt clever innovations by their enemies—notably, the concept of heavy cavalry in the form of cataphracts of the Eurasian steppe.
The keywords of Byzantine-era combat: politically savvy, opportunistic, adaptable. They took Roman organisation and added the humility and pragmatism to incorporate whatever they saw that worked.

The Stirrup Controversy

There’s a theory that feudalism in Europe was a result of the introduction of the stirrup. Stirrups enabled “shock tactics”—ie, a fighter with a way to brace himself on his horse could hang on well enough to mow the enemy down. This tactic was so superior, Carolingian France in the 8th and 9th century structured itself around *infeudation*: rewarding its best mounted warriors with land. Those lords would then turn around and *subinfeudate*—think “sublease,” except the property is paid for with military service — lesser knights with smaller parcels of their land. (This is why, by the way, we still call the people we rent our apartments from “landlords” today.)

Although the causality is debated, it is undeniable that heavy cavalry and feudalism rose to prominence at the same time. Modern gangs are still structured similarly: a charismatic and physically dominant leader both charms and kills his way into power, personally appointing those he favours (who must have similar but not greater personal charisma and physical dominance) as his lieutenants, and so on down from there.

The keywords of medieval-era combat: heavy, aggressive, direct. Fundamentally, medieval society functioned on the premise that those who could take something, did.

Gunpowder and democracy

The earliest known gun appeared in Europe in the 14th century, and artillery became indispensable by the 15th.
Fortification designs rapidly began advancing to keep pace, and the importance of nobility in warfare eroded as heavy cavalry lost its advantage. Longbows and pikes, used intelligently, could be very effective against armoured knights, but both required a lifetime of training that made it difficult to amass large forces.

As technology improved, “hand cannons” became prominent among infantry. The flintlock musket of the 17th century could kill an armoured man at 100 yards and did not require great physical strength to use. They weren’t particularly accurate, but in enough quantity, they didn’t need to be. By the end of the 17th century, mobility was preferable over the nominal remaining protection of armour, and thus the armour disappeared.

It’s been said that “The musket made the infantryman and the infantryman made the democrat.” The fact that anyone could use a musket made the common man relevant in combat, swelled the size of armies, bred nationalism (drawing men from across the country together to serve in organised corps) and made it feasible for a peasant revolt to have military effects.

The keywords of gunpowder warfare: easy-to-use, widely available, equalising.

The American 2nd amendment—written in the 18th century, within 100 years of muskets rising to prominence—is grounded in the idea that the muskets widely owned by common men are of adequate technological consequence to overthrow a monarchist government.

This is only a rough overview, of course, and does not even touch on naval warfare. Hopefully, though, it’s given you at least a few starting keywords to plug into google. If you’d really like to roll up your sleeves and dig in, some classic textbooks on the subject include The Cambridge History of Warfare by Geoffrey
Designing Realistic Magic Academies

October 2, 2014

Image Credits: Wikia & Wikipedia

About the Expert

This week’s expert is our first returning guest! Hannah Emery is a sociologist by training (PhD from UC Berkeley last year). Her guest post on developing fantasy cultures remains of the most popular articles in this series. Her professional specialties include culture, education, and identity; she wrote her dissertation on the social construction of identity, looking at how parents choose names for their children.

She’s taught courses on sociology, identity, and family. Hannah is currently teaching part-time and writing a series of fantasy novels.

She blogs at sociologistnovelist.wordpress.com, mainly about writing and the intersection of writing and social science.

Designing Realistic Magic Academies

When I reread JK Rowling’s Harry Potter books these days, I have different questions than I did the first time around. Questions like: who are the great legendary heroes of British wizarding society that every kid learns about? What options does a talented student like Hermione Granger have for post-secondary education?

Anyone who’s read or watched the Harry Potter saga knows quite a bit about Hogwarts. But even after reading all seven books,
I’m still pretty confused about the education of 20th-century British wizards. And if you’re planning to create a school of magic for your fantasy world, there are some things you should think about to keep your readers from having this same confusion. Most importantly, **you need to figure out the function of your school within its society**. Ask yourself this question: who is your school’s target audience?

**General or Trade Schools?**

At first glance, schools of magic would seem to be pretty common in fantasy fiction. Besides Rowling’s Hogwarts, there’s the Citadel in George RR Martin’s *A Song of Ice and Fire*, the University in Patrick Rothfuss’s *Kingkiller Chronicles*, and loads of others. However, **most institutions of magical learning seem to operate on the trade school model**: students are a slice of the general population, of various ages and backgrounds, who’ve come in search of highly specialized knowledge or training.

Hogwarts, on the other hand, is a general education program: all British witches and wizards between the ages of 11 and 17 are expected to pass through its doors. Like general schools in most parts of the world, it divides its students primarily by age, and students have relatively little choice in which courses they take for most of their academic career. Hogwarts students aren’t there to get a cosmetology certificate or a law degree: they’re just trying to graduate from high school.

**The Prevalence of Formal Education**

Although human societies have always had to train their children in how to be productive adults, and formal instruction for some elite portion of the population (on topics including literacy,
mathematics, philosophy, theology, and science) has existed in almost every society throughout history, widespread education of “the masses” is a relatively new concept. Laws requiring formal schooling for all children regardless of their background first appeared in parts of Protestant Europe in the 17th and 18th centuries; compulsory schooling didn’t become the general law in the United States until 1918 (though many states mandated it decades earlier).

Let’s say your story is set in a version of our modern real world. There’s almost certainly some sort of mandatory, formal education for children. At least through the mid-teenage years. So you’ve got a school system designed to serve the general population. Your next task is to think a bit about the people who designed the system, and figure out their goals.

Goals of Western Education Systems

A quick look at the history of the modern Western educational system shows that the people putting together public schools have had different goals at different times, and these goals have all affected our complicated modern system. Scholars of education pretty much agree that in the 21st century, the general Western education system has a few main purposes:

1. Instilling practical life skills

   Although there are a lot of debates these days about what schools ought to be teaching students – how human sexuality should be discussed in school (or if it should be discussed at all), whether programming courses should be mandatory, whether teachers should make sure every high school graduate can balance a checkbook and change the oil in their car – there are a few skills the modern world takes for granted.
If you’re an adult living in an industrialized country, it’s expected that you can read, write, and do basic math. That’s one reason standardized tests focus on these skills: someone who’s illiterate or innumerate will have a really hard time in the modern world.

2. Developing loyal citizens

The first public schools in Protestant Europe came about because religious leader Martin Luther thought it was important for all citizens to be able to read the Bible. In the United States, widespread public schooling became popular during the massive immigration of the 19th century, and one of its main goals was to teach immigrant children how to be Americans. The Pledge of Allegiance was developed with this goal in mind; ditto the story many American children still learn about President George Washington chopping down a cherry tree as a boy.

Although many modern schools try to take a more multicultural approach they tend to teach children about their own nation’s geography, civics, and history. Public schools put a country’s entire next generation in a room together to learn about the world. It’s unavoidable that part of that learning will involve establishing some basic norms about what it means to be American/Australian/Japanese/a British wizard.

3. Establishing cultural literacy

If you grew up in the United States, there are certain books you probably read in high school: The Grapes of Wrath, Catcher in the Rye, To Kill a Mockingbird. If you grew up in the English-speaking world, you probably have at least a passing acquaintance with Romeo & Juliet and Hamlet. The markers of what constitutes
“an educated person” are different from one place to another, but education almost always includes more than facts and figures. Depending on which rank of society you’re planning to move in once you’ve finished your education, the amount of “culture” you’re expected to be familiar with could go beyond literature. You might be expected to speak a foreign language fluently, or to recognize classical music or fine art, or to know which fork to use at a fancy dinner party. Which brings me to the final role of formal education...

4. Gatekeeping and credentialism

As I mentioned, in much of the world throughout much of history, formal education was the domain of an elite few. As education expanded to the masses, that wealthy few began creating additional prestige markers to set themselves apart. For a while, it was only the elite who attended high school; then, it was only the elite who pursued bachelor’s degrees; now – well, you get the idea.

This phenomenon, called credentialism, is one thing sociologists point to as a cause of “degree inflation” (where bachelor’s degrees are increasingly not sufficient education for a professional job). The harder it is to get credentials for a job, the longer that job will stay in the hands of the elite.

With these goals in front of us, we can see that Hogwarts has an odd curriculum for a modern comprehensive school. As far as we can tell from the books, it focuses heavily on the acquisition of practical skills: like Martin’s Citadel and Rothfuss’s University, it feels much more like a trade school than a place for general education.

Designing Your Magic School
If your school of magic is a specialized place where people go to learn the wizarding arts, then you can feel free to make the classes as content-focused as you want. But if you’re designing a place for general education, you’ll want to include at least a little of the other stuff. Here are some things to consider:

- What **cultural touchstones** are young people in your magical society expected to be familiar with by graduation?
- What does “an educated person” look like?
- Who teaches students the basic **intellectual survival skills**? These could be reading and fundamental math; they could also be something completely different.
- How do the **elites in your society** (because every society has people who’d rather not mingle with “the masses”) set themselves apart?
- Are there private magic academies that teach **spells in ancient languages** known only to the wealthy?
- Does your school have the equivalent of **AP courses**, or a PTA pushing the school to offer Mandarin to give their kindergartners a jump-start on the road to Harvard?

You don’t have to put it all in; you probably shouldn’t. **Like all worldbuilding, a little in the text goes a long way.** But thinking about it will help you build a better magic school, and with it, a better world.
Nothing drives me crazier than authors—or patrons at Renaissance Faires—addressing everyone and everything as “mi’loooooooord.” Firstly, no one outside of possibly a few British comedians in the 1970s has ever pronounced the word “my” that way. Secondly, not everyone is a lord; that notion defies the most basic grasp of economics. Thirdly, there are different kinds of lords, especially in different periods—the system was constantly
evolving. Finally, there are specific ways to address each type depending on who you are.

Detailing every type of feudal lord that ever existed is a Herculean task already undertaken by numerous (very dry) textbooks, so today I’m going to break down the underlying reasoning behind the system. As fantasy authors, you do not need to cleave to any existing real world system, as long as yours is created with a reasonable, self-consistent logic. For this mini lesson, I’m going to focus primarily on the English system from the Norman Conquest to the War of the Roses.

**Rule 1: Not Everyone Was A Lord**

Let’s start with the fundamentals of feudalism. As I said in my last lesson, the basic premise was that “those who could take something, did.” The Norman Conquest was exactly what it sounded like: William, Duke of Normandy, trumped up a claim to England, then sailed over from France and took it. That wasn’t the first time, either; William wasn’t French. “Norman,” or “Northman,” was the French word for the Vikings who sailed down from Scandinavia and took half of France, thus starting a long tradition of the English taking whatever the hell they wanted.

The economics functioned as follows: if you were spending all your time practising with your sword to get better at taking things, you weren’t able to grow your own food. You had to convince the farmers to give you a share of their crops, in the original form of income tax: *tithe*. How to accomplish that? Show up at their houses with all your sword-toting buddies and take it. By now, you’re hopefully starting to picture the king and all his peers a lot less like this:
And a lot more like this:

Enter the concept of the landlord. Yes, this is from whence modern word originates. Technically, all the land belongs to the king. He permits the farmers to live there and work it for him in
exchange for tithe. Since he can’t manage it all directly, he leases big chunks of it to his favourite armed thug buddies, known as “creating” them the Earl, Duke, etc, of a given area. They then receive tithe for their portion, and owe him military service in exchange for the hookup. A lord was functionally the local cartel boss. The Don, the Jefe, however you like it. By nature, there aren’t very many of them.

As of 1307, there was still only one type of lord below the king: an Earl, from Old Norse Jarl. And there were only eleven of them. England may not look very big on a map, but next time you visit, try walking from London to York with only the clothes on your back and as much food as you can carry. To the average person of the era, it was a serious undertaking to get beyond the borders of the Earldom in which you were born. They knew they had a Lord, theoretically, receiving all their taxes, and a king somewhere, but nothing about either of them.

Modern Americans: unless you live in the capitol and work in a relevant business... have you ever actually met the President? Or even the governor of your home state? Do you even know your governor’s name without googling it? There are literally five times as many American governors now as there were British earls in the 13th century, and you don’t walk around seriously expecting to bump into one on the street.

**Rule 2: The System Keeps Changing**

The fun part about things made up at the whim of a single guy is that the rules keep changing. During the reign of William I, there were exactly three types of nobility: King, Earl, and Baron. The first British duke was created in 1337, when Edward II made the Black Prince Duke of Cornwall. A duke was below the king but above an earl.
In 1385 Richard II created Robert de Vere (already the 9th Earl of Oxford) the 1st Marquis of Dublin. “Marquis” is a reference to the “marches,” or borders, as he was defending a border territory. The next marquis, created 1397, refused to use the title because he felt a made-up honour carried no weight. It went unused until Henry VI revived it in 1442. No further titles came into use until the Renaissance. As of 1611, the British hierarchy went:

- King
- Duke
- Marquis
- Earl
- Viscount
- Baron
- Baronet

To make things infinitely more complicated, the rest of Europe followed their own rules. For the most part the terms and hierarchy were comparable, and variations are pretty obvious in the term used: a Grand Duke, for instance, would be above a regular Duke.

Making a word diminutive, such as Count/Viscount or Baron/Baronet implies the new position was just below the one from which it is derived. Count, btw, is the continental word for Earl, and Earl’s wives were still called Countess (probably because Earless sounds like something that happened to Van Gogh.) It’s important to realize that kings were not the only type of sovereign (ruler with no one above them) nor were they necessarily the king of a particularly large area.

There were—and still are—some sovereign duchies, in which the Duke is the top of the line. Pre-conquest England was divided up into dozens of small kingdoms, such as Mercia, East Anglia, and Wessex, which were eventually consolidated by the usual
means of one of the kings beating up his neighbour and taking the land. (This is true throughout most of world history. The Illiad speaks of a “coalition of Greek Kings” of which Agamemnon was High King. Ramses the Great self-described as “King of Kings” as did many Persian “Shahenshah”s.)

Prince was not always a word for king’s son, either: in its broadest sense, “prince” is a generic term for a top-level ruler. One might refer to a collection of “foreign princes” as being a general mishmash of approximately ruling-class men who might have a reasonable claim to a sovereign rule of a country, including Dukes, Emirs, Shahs, and what have you. For an exhaustive list of examples to create your fantasy hierarchy from, see Wikipedia’s entry on royal and noble ranks.

**Rule 3: Specific Forms of Address**

A king or queen is addressed as “his/her/your Majesty,” a prince or princess as “his/her/your Highness,” and a Duke/Duchess as “his/her/your Grace.” Everything below that is “his/her/your Lordship/Ladyship.” “His/your Excellency” came much later, and was used for a chancellor or prime minister. You can invent more, but make sure they differ from ones that already exist. It’s also extremely common to refer to someone by the name of the land they own, which is NOT the same as their family name. Sir denotes knighthood.

It is a job qualification, and as such, goes with a man’s first name. Being a knight means you get to be called Sir, just as having your PhD means you get to be called Dr. Lord denotes ownership of property. It goes with the land, not a man’s name, because you are saying he owns the land, not his own name. Most Lords happen to also be knights, but that’s sort of like saying “Most of the largest properties in the world are owned by people who have
graduate degrees.” It’s an interesting fact, but the degree does NOT bring the land with it. You can have “Sir so-and-so, who doesn’t own anything in particular,” just as completing your PhD does not automatically give you a gargantuan estate.

Master is a last-resort polite form of address if someone is landless and not a knight, likely a younger son of petty gentry, or a tradesman. In general, use the most flattering/important title available, unless the character is purposely being familiar or rude. I’ll use examples from my own fictional world: Teagan Chambrer, Knight Commander General, youngest (non-inheriting) son of the Thegn of Duck’s Crossing, could be addressed as:

- Sir Teagan
- General Teagan
- Master Chambrer (but this would be insulting, as it ignores the fact that he is an officer)

But NOT:

- Lord Anything (he’s not.)
- Sir Chambrer (he, Teagan, personally, is the knight, not his entire family.)

William Huntley, 1st Earl Greenford, knight of the realm, could be addressed as:

- Lord Greenford
- Greenford (with no preamble)
- Sir William (but a bit familiar/pretentious to use his personal name, as it implies that his person is more relevant to you than his status as an Earl. Might be used by friend or a woman flirting with him.)
- Master Huntley (but again, insulting.)

But NOT:

- Sir Huntley (he, William, personally, is the knight, not his entire family)
- Sir Greenford (his property is not a knight.)
- Lord Huntly (owner of his family?)
- Lord William (owner of himself?)

Robert Caenid, 2nd Earl Nor’watch, knight of the realm, and Lord Treasurer, could be addressed as:
- Lord Nor’watch
- My Lord Treasurer
- Sir Robert (again, personal)
- Master Caenid (again, insulting)

But NOT
- Lord Robert (owner of himself?)
- Master Robert (master of himself?)
- Sir Treasurer (the office of treasurer is a knight?)

Stephen fitz Wheelwright (note, “fitz” means “son of” and wheelwright is a profession, such as baker, miller, smith, thatcher, fletcher, cooper, etc. This is a literal statement that his father is the town wheelwright, not a family name.) Captain of the guard, not a knight, could be addressed as:
- Captain Stephen
- the wheelwright’s boy (insulting now that he is an officer. Would have been his form of address formerly.)

But NOT:
- Sir Stephen (he is not.)
- Master Wheelwright (that’s his father.)

Use of a first name in isolation of any title or pet name is extremely personal. **No one, regardless of comparable rank, addresses someone by a pet name uninvited,** unless they are purposely being rude or overly familiar. It sets the tone of the situation – if my boss were to say, “Morning, Jerry!” I might reply, “Morning, Ben!” but if he were to open with “Good morning, Mr.
Quinn,” I sure as hell better retreat behind, “Good morning, Mr. Stirling” unless I want to get in trouble.

Generally, all women married to a knight or better can be referred to as “my Lady,” although you would only attach a name if you would do so for her husband. A lady retains her title after being widowed as a courtesy, even if she remarries a man of lesser station. If there is a new woman who can claim the same title, the word “dowager” will be attached to specify. Eliza Caenid, widow of the former Earl Nor’watch, mother of Robert, the current Earl Nor’watch, could be addressed as:

- My Lady Countess
- the Dowager Countess Nor’watch
But NOT:
- Lady Nor’watch (that’s her daughter-in-law.)

**Conclusion**

The biggest thing to remember when designing your own system is *it’s all about the land*. You only get as many lords as you get mob bosses; when too many try to exist in a given area, turf wars occur. Since the land is so important, the form of address almost always makes reference to it, and you certainly wouldn’t treat someone like he ran the place if he didn’t. (Just picture what would happen if the Godfather overheard you calling some other shmuck “boss” instead).

This is only the briefest of overviews, of course, but hopefully it gives you some keywords to plug into Google. If you really want to get into it, some very thorough (and mind you, antique) resources include: *A Genealogical History of the Dormant, Abeyant, Forfeited, and Extinct Peerages of the British Empire* by Sir Bernard Burke, *A Directory of British Peerges* by Francis
Leeson, and *The genealogy of the existing British peerage, with sketches of the family histories of the nobility* by Edmund Lodge.