THE HISTORY OF ENGLISH PODCAST
TRANSCRIPT

EPISODE 115:
THE MEASURE OF A PERSON

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Welcome to the History of English Podcast – a podcast about the history of the English language. This is Episode 115: The Measure of a Person. In this episode, we're going to look at the way we measure things and the words we use for measurements. This is really an extension of the last episode where we explored the history of numbers. People used numbers in lots of different ways, and one of the main uses was to measure things. But for much of human history, measurements varied greatly from region to region. And even within the same region, measurements were often inconsistent. But around the current point in our overall story of English in the early 1300s, all of that started to change. Around this time, many of our common measurements were standardized which allowed for more precision and accuracy. This time, we'll explore those developments, and we'll see how the evolution of measurements contributed to the English language.

But before we begin, let me remind you that the website for the podcast is historyofenglishpodcast.com. And you can sign up to support the podcast and get bonus episodes and transcripts at Patreon.com/historyofenglish.

Now last time, we looked at the history of numbers and the words we use for numbers. And we saw that the modern Hindu-Arabic numerals were just beginning to appear in England in the early 1300s. But it took a long time for Europeans to appreciate the mathematical benefits of the new numbers. For most of the Middle Ages, the English held onto their traditional Roman numerals, and that meant that most people didn't have the ability to make advanced calculations. Numbers were used for basic counting. They were used to keep track of things like the total number of sheep in an open field. And they were used in trade and commerce and in the assessment of taxes. And numbers were also used for basic measurements – to measure things like length, distance, area, volume, and weight.

Like today, measurements permeated daily life. Land was divided into parcels based on specific measurements. Taxes were assessed based on those measurements. Craftsmen and farmers relied on specific measurements to keep track of their commodities. And those commodities were bought and sold in specific amounts.

Like most aspects of daily life after the Conquest, measurements were often a blend of native Anglo-Saxon units, traditional Roman units, and borrowed French units. And that meant that the words for those measurements were derived from a variety of sources. Some were native to English and some were loanwords. In fact, some of the oldest Latin words in the English language are words associated with Roman measurements. And that's because the Romans traded with the Germanic tribes of northern Europe. So some of those Latin words were in the original Proto-Germanic language before the Anglo-Saxons relocated to Britain.

Latin words like ***pound*** and ***mile*** are older than English itself. They are well-attested throughout the Germanic languages and were almost certainly borrowed by the original Germanic speakers on the continent. The word ***ounce*** is another Latin word attested in some of the earliest documents composed in Old English. After the Conquest, the Normans imposed even more continental measurements. That gave English even more measurement terms from Latin and French. French words like ***gallon*** and ***bushel*** appear for the first time in English documents around the year 1300 at the current point in our overall story of English.

The word ***quart*** was borrowed from French a couple of decades later. I noted last time that the word ***quart*** is derived from the Latin word for 'four' which was ***quattuor***. It gave us the word ***quarter*** meaning one-fourth, and it gave us the word ***quart*** meaning one-fourth of a gallon.

By the end of the 1300s, the words ***pint*** and ***peck*** had also been borrowed from French. The word ***pint*** appears to be derived from the same root as the word ***paint***, and one theory holds that ***pint*** was derived from containers that had specific marks painted on them to indicate that amount.

Of course, in many places today, those traditional units have been replaced with metric units. The metric system that was devised in France in the 1790s in the midst of the French Revolution. And it gave English other words like ***meter***, ***liter***, and ***gram*** which were all borrowed in the late 1700s, even though that system didn't gain widespread acceptance until the 1900s.

By the way, the words ***meter*** and ***metric*** are both derived from the same root as the French word ***measure***, and the word ***measure*** itself was a relatively new word in English at the current point in our overall story in the early 1300s.

So as we consider those words, we can see that many of the terms we use for measurements today are loanwords. Some were borrowed during the Anglo-Saxon period, some came in after the Norman Conquest, and some came in with the metric system in recent centuries. This reflects a long-term trend whereby measurements have become standardized over time, and many of those standardized measurements have their origins in continental Europe.

But as I noted, the Anglo-Saxons did have their own native measurements, and some of those units – or at least the words for those units – are still with us today. The best example of that is probably the word ***foot***. Like most basic body parts, the word ***foot*** comes from Old English. The foot was both a body part and a standard unit of length in the Anglo-Saxon period. Of course, the length was roughly based on the length of a human foot. And in fact, most ancient societies used the human foot to measure length. The Egyptians, Greek and Romans all had a measurement unit based on the length of the foot, and the measurement was named after the word for foot in those languages. The Greek foot was a ***pous***, and the Roman foot was a ***pes***. And thanks to the P to F sound shift under Grimm's Law, we can see that ***pous***, ***pes*** and ***foot*** are all derived from the same Indo-European root word.

There is a reason why the foot was such a common unit of measurement in ancient societies, and that's because early humans had to come up with a way to standardize measurements. And the obvious way to do that was to resort to body parts. It was something that everyone had in common, and it was something that people carried with them everywhere they went. So many ancient measurements were ultimately derived from body parts.

In the last episode, I noted that the tendency of ancient humans to count in units of 10 was ultimately based on the fact that humans have 10 fingers. And even the Sumerian system which used a base of 60 – and an auxiliary group of 12 – may have been based on a specific finger-counting method which I described in that episode. So the human body was essentially an ancient calculator, and it was also an ancient measuring stick.

Not only was the foot a standard unit of measure, so was the hand. The Romans had a measurement called a ***palmus***. That word became ***palm*** in French, and in the 1300s, English borrowed that word ***palm*** both in reference to a part of the hand and as a specific unit of measurement. The measurement was approximately the width of a hand. For much of the Middle English period, the people of England measured things in palms. But during the 1500s, English speakers came up with their own version of that measurement by using the native word ***hand***. The word ***hand*** eventually came to refer to a measurement of 4 inches. And if you're an equestrian, you'll know that the height of horses is still measured in hands.

Beyond feet and hands, many ancient cultures also used a finger to measure short increments. The Egyptians, Greeks and Romans all used their fingers in this manner. It Latin, that type of measurement was called a ***digitus*** – or ***digit*** in English. Of course, it meant a finger, and in Modern English the word ***digit*** can still refer to a finger or a numeral. But ***digitus*** – or ***digit*** – was also once a term for a specific unit of measurement – specifically about 3/4 of an inch. And again, it was based on the width of a finger.

So individual body parts were often used – from fingers to hands to feet – but since those units varied from person to person, they varied greatly in actual use. Given that problem, there was a constant need to standardize those units. And those units worked better if they could be coordinated so that the various units worked together. So it made sense if there were a certain number of digits in a palm and a certain number of palms in a pes or foot. So early on, the Romans did that by declaring that there were four digits in a palm and four palms in a foot. And that meant that the digit was the smallest increment of a foot, and if you do the math, there were 16 digits in a foot.

But later on, after the fall of Rome, in the early Middle Ages, the pes or foot was redefined. And it was redefined by dividing it 12 parts instead of 16.

As we saw last time, the ancient Sumerians often counted in units of 12, and that system had spread eastward over time. And that led to Romans to sometimes divide larger units into 12 parts.

The Latin word for 1/12 was ***uncia***. So anytime something was divided into 12 parts, each of those smaller parts was called an ***uncia***. And when the Latin foot was redefined by dividing it into 12 parts instead of 16, each those new units were called an ***uncia***. And over time, that word ***uncia*** passed into English as ***inch***. So the word ***inch*** literally means 1/12. It was borrowed by the Anglo-Saxons in the late Old English period. And by that point, the English foot was largely modeled on the Roman foot or ***pes***, so England also divided its foot into 12 parts. And those parts were called ***inches***. So even though the foot is a native English measurement, the inch is a measurement from the continent.

By the way, when the Latin word ***uncia*** passed into English as ***inch***, it was actually the second time that English had borrowed that word as a measurement term. Under the Troy system of weights, which is still used for precious metals, the pound was divided into 12 parts instead of 16. Since each part was 1/12 of a pound, each of those parts was called an ***uncia***, but that version of ***uncia*** became ***ounce***. So believe it or not, the words ***ounce*** and ***inch*** are two variations of same Latin root word which meant 1/12. One was applied to length – being a twelfth of a foot – and one was applied to weight – being a twelfth of a pound. The difference in pronunciation has to do with the fact that the words were borrowed at different times. As I noted, i***nch*** came in during the late Old English period, and ***ounce*** was actually borrowed twice – first in early Old English as ***yndsan*** and then again from French after the Norman Conquest as modern ***ounce***.

So again, ***inch*** and ***ounce*** share the same root meaning 1/12, and inch came into English after the foot was re-divided from 16 parts to 12 parts. So the old 16 digits were replaced with the new 12 inches. And once the Anglo-Saxons had adopted those inches, they didn't have as much use for the old digits used on the continent. And that's why digits had very limited use in England.

But keep in mind that measurements like digits and palms and feet reflect a time when ancient people used their body parts to measure things. But what did they use when they wanted to measure something bigger than a foot? Well, of course, they could use multiple feet. But they also had a slightly larger unit which they could use. And this next largest unit was based on the length of an arm or part of an arm.

One of the most basic units of measurement throughout the ancient world – across many different cultures – was the distance from the elbow to the tip of the fingers. This unit of length was used by the Sumerians, Egyptians, Greeks, Romans and the Germanic tribes. The Romans called it a ***cubit***, and it is generally known as that today, even though each culture had their own word for it. And within this common unit, we might find the ultimate origin of our modern ***yard***. And I say "might" because the connection is a little bit vague. But before we can explore that connection, we have to consider how the Anglo-Saxons defined this unit.

As I noted, the Anglo-Saxons had this same basic unit, but they had their own word for it. They called it an ***eln*** in Old English. ***Eln*** literally meant arm or forearm, and that word came to refer to the average length of a person's forearm. The word lost its 'n' over time and became simply ***ell*** – E-L-L – by the start of the Modern English period. By the way, that old word also gave us the word ***elbow***. ***Eln*** meant arm, and ***bow*** – or ***boga*** – meant a bend. So ***eln-boga*** meant the place

where the arm bends, and over time ***eln-boga*** became ***elbow***. So the word ***eln*** – or ***ell*** – survives as part of the word ***elbow*** and as an old unit of measure equal to the length of the forearm.

Now I said that the Old English word ***eln*** could refer to just the forearm or to the entire arm. And this created some confusion with the measurement over time. It originally referred to a smaller unit – basically the length of a forearm. But over time, it came to represent a longer unit – the length of an entire arm.

This measurement was used in many parts of northern Europe including Britain and Flanders. And it became a standard unit for measuring cloth. I've talked about how important the cloth industry was in those regions in an earlier episode, and that's why the ***ell*** became such an important measurement in Medieval England. You could hold a large piece of cloth near your torso and extend a segment outward with your hand. That was one ell. You could then grab the next segment and extend it outward. Each time you did that, it was an ell. So it became common to measure cloth in this manner.

This measurement was very common in the Middle English period and even into the early Modern English period. In the 1500s, a specific saying began to appear in many English documents. Though the wording varied, it was essentially "If you give him an inch, he'll take an ell." This saying is recorded many times from the 1500s through the 1700s, but it was almost rendered with the word ***ell*** at the end. But when the ***ell*** ceased to be used as a common unit of measurement, the phrase was re-worded. Then people started to say, "If you give him an inch, he'll take a yard" – or "take a mile." Those sayings are still common today, but its original version used the word ***ell***.

Now, again, the word ***ell*** was a native English word. But when the word was used in Latin documents, it was often translated into Latin as ***ulna***. Remember that ***ell*** or ***eln*** originally meant forearm in English, and ***ulna*** was the Latin word for forearm. We still have the word ***ulna*** in English meaning the large bone in the forearm. So in Latin, the measurement of an ell was often rendered as an ***ulna***. And in fact, ***eln*** and ***ulna*** both come from the same Indo-European root word which meant forearm.

So we've talked about digits and palms and feet and cubits and ells. All of those old measurements were ultimately based on body parts. But the problem with using body parts is that the actual size varied a little bit from person to person, so these units varied greatly throughout England and throughout Europe.

Very often, there was no fixed standard. And if there was a standard, most people didn't know what it was. Since measurements were highly variable, it created a lot of problems – especially when it came to trade and commerce. Buyers wanted to be certain that they were getting what they paid for. There were occasional attempts to standardize and fix those measurements, but those efforts met with mixed success.

There is an often repeated story that Henry I tried to standardize the length of the yard in England during his reign in the early 1100s. According to the story, Henry proclaimed that the 'yard' was to be fixed as the distance from the tip of his nose to the end of his outstretched thumb. Now there is one basic problem with this story. You might have noticed that I haven't really said anything about the ***yard*** so far, and that's because the yard didn't really exist a measurement at that point – at least not in any surviving documents. This story about Henry trying to standardize the yard is actually taken from William of Malmesbury's history of that period. You might remember that William of Malmesbury is one of the most famous historians of the Norman period in England, and he lived during Henry's reign. William wrote that Henry fixed the length of the ell – not the yard. He wrote that Henry was upset that traders were using a false ell to take advantage of customers, so Henry declared that the ell was to be fixed as the length of his arm and anyone who used a different measure was subject to severe punishment. It wasn't until later centuries that this account was re-told and modified to refer to the yard and to refer to the distance from Henry's nose to his thumb. So it was actually the ell that was standardized by Henry in the early 1100s.

Now we don't know how Henry enforced his rule which fixed the size of the ell. I mean, how were merchants supposed to determine the exact length of Henry's arm? Traders couldn't exactly call up the king and ask him to show up in person every time they needed to measure something. We don't really have an answer to that question, but a few decades later, during the reign of Richard the Lionheart, a new law was issued (Assize of Measures 1197) which proclaimed that the size of the ell should be fixed by an iron rod, and the length of that rod would be the official length of the ell. So that law suggests that an iron rod representing the ell was made and maintained during that period. But again, nothing more is known about that iron rod. And notice that nothing was said about feet or inches or other measurements. So those lengths remained somewhat variable.

The people of England had to wait until the current point in our story in the early 1300s for all of this to be resolved. And it was resolved by a law issued during the reign of Edward I. As we saw in prior episodes, Edward's reign is known for many things, including his conquest of Wales and his temporary conquest of Scotland. But he also gave us the modern inch and foot and the measurement that became known as the yard.

The surviving statute books from this period include a law which attempted to define and fix the basic measurements of length in England. It also referenced an iron ell or Iron Ulna maintained by the king which was to be used to fix the measurements. The law was written in Latin, but in Modern English it reads as follows:

"It is remembered that the Iron Ulna of our Lord the King contains three feet and no more; and the foot must contain twelve inches, measured by the correct measure of this kind of ulna; that is to say, one thirty-sixth part of the said ulna makes one inch, neither more nor less... It is ordained that three grains of barley, dry and round, make an inch, twelve inches make a foot, three feet make an ulna, five and a half ulna makes a perch, and forty perches in length and four perches in breadth make an acre."

Now keep in mind that many Latin documents used the Latin word ***ulna*** for the English word ***ell***. So this law mentions the ***ulna***, but it was really referring to the English ***ell*** which was that unit based on the length of an arm or forearm. Again, the law fixed the size of the ulna or ell by reference to this iron rod which apparently existed. This iron rod or Iron Ulna consisted of three feet, so 1/3 of the rod equaled a foot. And each foot consisted of 12 inches. If that sounds a lot like a yardstick, it's probably because this Iron Ulna was essentially the prototype of the later yardstick. The law also said that the inch was equal to three grains of barley. It was a tradition to measure certain small units like inches with grains of barley, and this law does the same thing. So since average people didn't have access to the king's iron rod, they could at least estimate the length of an inch in this traditional manner.

Again, we don't find the word ***yard*** in this law, but we have the first formal statement that the king's iron rod or Iron Ulna was three feet in length, and this appears to be the measurement that soon became known as a ***yard***. In fact, the word ***yard*** in its sense as a measurement originally meant 'a stick' in Old English. So a ***yardstick*** is literally a 'stick stick' using the original meaning of the word ***yard***.

Now up until the current point in our story in the early 1300s, the word ***yard*** was only used in a generic sense to mean a stick. But by the late 1300s, people started to refer to this specific measure of three feet as a ***yard***. It isn't entirely clear why the word ***yard*** replaced the traditional word ***ell*** or ***ulna***, but it did. It may have been because that unit of three feet was legally defined by reference to Edward's iron rod or Iron Ulna. And it appears that each town kept a copy of that rod which became known as an ***ellwand***. And those local ellwands could be consulted to verify the specific measurement.

Since the word ***yard*** originally meant a stick or rod, it seems logical that these three-foot measuring sticks just became known as ***yards***. And that gave us the term ***yard*** for a measure of three feet. Again, that's just a theory, but by the end of the century, the word ***yard*** had become an accepted term for that length. Over time, the ***ell*** became restricted to the cloth industry, and it eventually fell out of common use altogether. But the ***yard*** has survived, especially in countries like the United States which haven't fully accepted the metric meter.

By the way, I should note that the word ***yard*** in the sense of the 'front yard' or 'back yard' comes from a different Old English root, and it appears to be unrelated to the yard measurement.

So as we can see, our basic length measurements for small increments – the inch, foot and yard – were all standardized during the reign of Edward I. But what about larger measurements?

Well as I noted earlier, many ancient measurements of length were based on body parts. And a common unit of length was based on a person's outstretched arms. From fingertip to fingertip, this distance usually measured about 5 or 6 feet. It also happened to be roughly equal to a person's height, but it was easier to measure length by using the outstretched arms. The ancient Greeks had this measurement which they called an ***orguia***. The Anglo-Saxons had the same basic unit, and the Old English word for that unit literally meant 'outstretched arms' or 'embracing arms.' That word was ***fæðm*** which we still have today.

The word ***fathom*** literally meant an embrace, and the unit of length represented by a person's outstretched arms was also called a ***fathom***. It was typically a measurement of around 6 feet, and was very common in the Anglo-Saxon period. Through much of the Middle Ages, it was used as a land measurement, and by the 1500s, it had been officially fixed at a length of 6 feet. But it soon stopped being used to measure distances on land, and it started to be restricted to a measure of depth. It was sometimes used to measure the depth of a mine, but we mainly know it today as a measure water depth. And that's why sailors measured the depth of the sea in fathoms.

On the water, this type of measurement was usually made with a weighted rope which had a knot tied in it at every six foot increment. In other words, every fathom was marked by a knot. The rope was dropped in the water, and as it sank, the total number of knots taken into the water was the total depth in fathoms.

This also gave us the modern use of the word ***fathom*** as a verb. 'To fathom' was to check the depth of something – literally to get to the bottom of the sea or lake. So if you get to the bottom of something, you fathom it. We usually use the verb today in the negative. If I say, "I can't fathom why you would do that," what I'm really saying it that I can't penetrate or get to the bottom of the idea. I can't take the measurement or determine the answer.

Now traditionally, life at sea was very difficult, and death at sea was common. When someone died during a voyage, they were usually buried at sea, but those types of burials were not done in shallow water. They required deep water – normally a depth of six or more fathoms. And this is believed to be the origin of the phrase 'deep six' meaning death or the process of killing or rejecting something. So if you are considering an idea and you reject it, you might be said to 'deep six' the idea. This phrase first appeared in the early 1900s, and the 'six' in 'deep six' appears to be a reference to fathoms. I should note that there is a competing theory that the phrase has to do with a burial on land – essentially the same as putting someone 'six feet under.' But the phrase was originally common among sailors, and the Oxford English Dictionary attributes the six in 'deep six' to fathoms – not feet.

Of course, determining water depth was important for many reasons, including the safe passage of the boat or ship through the water. In the early United States, paddle steamers traveled up and down the Mississippi River, but they needed at least two fathoms of water to safely navigate the river. This depth was constantly checked to make sure that at least two knots of the fathom rope were being marked.

You might recall from the last episode that Old English actually had a masculine and feminine version of the word for ***two***. The feminine version gave us the word ***two***. And the masculine version gave us the word ***twain*** – as in "Never the twain shall meet." Well, on the Mississippi River in the 1800s, people still used that word ***twain***. And when the depth of the water was checked to make sure that the rope marked a depth of two fathoms, that measure was called a ***mark twain*** – literally 'a mark of two' or 'a mark of two fathoms.' That was a very important measurement because that's what the paddle steamers needed to navigate. And a young riverboat captain and budding writer named Samuel Clemens took note of that measurement. He heard people calling out the depth of 'mark twain' so much that he decided to make it his pen name.

And of course, today we know Mark Twain as the author of books like "The Adventures of Huckleberry Finn," but it was originally a term that meant a mark of two fathoms.

I should also note that sailors used knotted ropes for other reasons. Not only did they use them to measure the depth of water, they also used them to measure the speed of the boat. A separate knotted rope was thrown overboard as the ship moved. The sailors counted the total number of knots that were pulled into the water over a 30-second period. And that allowed them to measure the ship's speed in knots. And that's why nautical speed is still measured in units called ***knots***, though modern mechanical equipment has replaced those old knotted ropes.

Now I began this discussion by noting that the word ***fathom*** originally referred to a person's extended arms or arms that were spread wide open. Well, the word ***fathom*** is ultimately derived from an Indo-European root word that meant 'to spread'. As we know, the Germanic 'f' sound was often derived from an original Indo-European 'p' sound. And that happened here as well. The Indo-European root of ***fathom*** has been reconstructed as ****pete***. And that Indo-European root also passed into Latin as ***passus*** which later passed into English as ***pace*** around the current point in our overall story in the early 1300s. So ***fathom*** and ***pace*** are cognate. And in fact, just as ***fathom*** was a unit of English measurement, a ***passus*** or ***pace*** was a unit of Roman measurement. Whereas a ***fathom*** was based on arms that were spread wide, a ***pace*** was based on legs that were spread wide. Technically, when walking, it was the distance from the point where one leg left the ground to the point where the same leg touched the ground again. So let's think about that.

When you're walking, you take a step with one foot and then you take an equal step with the other foot. Each of these individual steps was called a ***gradus*** in Latin. And a ***gradus*** was a specific measurement of 2 ½ Roman feet. And two of these steps was a ***passus*** or ***pace*** – which was a specific measurement of 5 Roman feet. So a ***pace*** was basically two steps, and since we take a step with each foot, the pace was really the distance from the point where one foot leaves the ground to the point where the same foot touches the ground again. And again, the word ***pace*** is cognate with ***fathom***, even though a pace was five feet and a fathom was six feet.

Now the reason why a pace is important is because it was the foundational unit for the mile. The word ***mile*** is derived from the Latin world ***mille***, and you might remember form the last episode that ***mille*** meant one thousand. So that suggests that the word ***mile*** originally meant 1000 of something – and it did. It meant 1000 paces. And since a ***pace*** was five feet, that meant that a ***mile*** was originally 5000 feet. As I noted earlier, that measurement was borrowed by the early Germanic tribes and it then passed into Old English. So the mile is a very old measurement, and even though it is a Latin word, it has been a part of English from the very beginning. But the modern mile isn't 5000 feet – it's 5280 feet. So what happened there? How did we end up with that specific number of feet for such a basic measurement? Well believe it or not, the answer to that question actually lies in the ***acre*** and a specific Anglo-Saxon measurement called the ***furlong***. So let's consider those two measurements for a moment.

Both the acre and the furlong were Anglo-Saxon measurements, and both words go back to Old English. Today, an acre represents a very specific area, but in the Anglo-Saxon period, it had a much looser definition. Again, almost all the measurements we've looked at had a looser definition back then. Originally, an acre of land was considered to be the total area of land that a plowman could work in one day with a group of oxen. Now the reason why that was such a loose concept is because the nature of the soil varied from region to region around the British Isles. Some regions had soil that was easy to plow, and that meant that a plowman could work a lot of it in the course of a day. But other regions had harder and rockier soil that was difficult to plow. And in those regions, a plowman could only work a small portion each day. So the size of the acre actually varied with the soil, and therefore varied from region to region.

In Devon in the west of England, an acre was 5760 square yards. In Scotland, an acre was over 6000 square yards. In Ireland, it was almost 8000 square yards.

Now, in order to understand the how the acre became standardized, and how it ultimately influenced the mile, we have to consider that farmland was usually divided into fields of a very specific shape and size. So an acre wasn't just a theoretical measurement, it was actually a physical piece of land. A field would be clearly marked and laid out as an acre. And an acre field was usually a long narrow rectangle. Its length was ten times longer than its width.

When the farmer plowed that long narrow acre, he would lead his oxen along the length of the field. The trench that was created by the plow was called a ***furh*** – or ***furrow*** as it is known today. And the entire length of that furrow from the beginning of the row to the end was called a ***furlong*** – literally a 'furrow-long' – meaning the length of the furrow. So this furlong also became a standard measurement over time. A furlong was basically the length of one of those standard rectangular acres. But again, the precise length of the furlong varied depending on the precise size of the acre. In southern England, it was approximately 600 feet because an acre was usually laid out with about 600 feet on the long side and about 60 feet on the short side. But again, the size of the furlong and the acre varied a little bit from region to region.

So the acre was much like the inch, the foot and the ell in that it didn't really have a consistent definition throughout England. But when Edward I standardized and fixed those other measurements, he also standardized the acre. The very end of that law I read earlier declared that a standard acre was to be 40 perches long and 4 perches wide. A perch was a unit introduced from France, but the law states that there were 5 ½ ulnas in a perch, and as we know, there were three feet in an ulna. So if we do the math, Edward's law declared that a standard acre was to be 660 feet long and 66 feet wide. And here's the thing, since the long side of an acre was called a furlong, this new law also had the effect of fixing the length of the furlong at 660 feet. So even though the law doesn't specifically mention the furlong, it standardized it anyway since it was tied to the size of the acre.

Now I began this discussion by saying that the furlong had something to do with the specific length of the modern mile at 5280 feet. Well, Edward's new law provides the connection. Remember that the Roman mile was 5000 feet – a nice round number. And the Romans divided

that mile into 8 smaller units called stadia. So each of those 8 increments was 625 feet long. 5000 divided by 8 is 625. So the Roman units fit together perfectly.

Now, the Anglo-Saxons were familiar with those 8 divisions called ***stadia***, but that length was almost exactly the same size as the traditional English furlong. So rather than adopting the Roman unit – or the Latin word for that unit – the Anglo-Saxons just called that unit a ***furlong***. So on the continent, a mile was divided into 8 stadia of 625 feet each. And in England, a mile was divided into 8 furlongs of around 600 feet each. So again, same concept, but England just used its traditional furlong. But, when Edward I fixed the size of an acre, and thereby fixed the size of the furlong at 660 feet, that created a problem. Remember that the Roman increment was only 625 feet long. So this new law meant that the English unit was now officially 35 feet longer than the Roman unit.

With this new law in place, what was the proper definition of an English mile? Was it still 5000 feet, or was it still 8 furlongs? It couldn't be both anymore. If it was 8 furlongs, that would make it 5,280 feet using the new standard measurement.

This dispute wasn't fully resolved until the year 1593 during reign of Elizabeth I. In that year, the second option was chosen. Since the furlong was such a common unit of measurement in the countryside, and since it was so fundamentally tied to the taxable acre, it was decided that the English mile should be based on that unit even though it resulted in a mile with a peculiar length when measured in feet. But again, since the mile was such a long distance, people didn't really think of it in feet, they thought of it in furlongs. So the furlong became the basis of the English mile, and the English mile was set at 5280 feet.

So the English measurements of length and area owe a great deal to Edward I. And by fixing the size of those units, he moved English society away from the variable and inconsistent units that had been used previously to the fixed, regimented system that we use today. To be fair, things didn't change overnight, but Edward's reign did mark a turning point.

Now in this episode, I have focused mainly on the measurement of length and area, but the measurements of weight and volume were also evolving during this period. I noted earlier that words like ***pint***, ***quart***, ***gallon***, ***bushel*** and ***peck*** were all borrowed from French during the 1300s. Whether the measure was native to England or borrowed from France, there was an increasing emphasis on standardized units during this period. The loose, inconsistent measurements of the Anglo-Saxon period were becoming fixed units, and one of the main reasons for that change was the growth of trade and commerce. As traders traveled around the British Isles, they routinely encountered measurements that varied from place to place. By standardizing those measurements, it allowed everyone to operate with the same basic units, and it provided a reliable standard for buyers and sellers. And anyone who deviated from those standards was subject to punishment.

As I noted earlier, Henry I had tried to fix the length of the ell in the early 1100s because traders were taking advantage of people by using a shorter length. A buyer might think he was buying 12 ells of cloth, only to find out later that he had only purchased 10. Without a fixed standard, careless buyers were routinely short-changed in that way.

This was an especially common problem at the large fairs held throughout Europe. Some of the merchants took advantage of buyers, and some even engaged in outright fraud. Some bakers would sell bread with stones inside to increase the weight of the loaf. Instead of selling dry pepper, they would sell damp pepper which weighed more. So the buyer wasn't buying as much pepper as he or she had paid for. The moisture also made the pepper rot quicker. Some merchants sold bad meat to customers.

In order to address those problems, the large fairs adopted specific rules designed to prevent that type of abuse by merchants. Those rules included a fixed set of measurements which each merchant had to honor. And to enforce those rules, the fairs set up their own courts to hear complaints made against any of the merchants. The court was actually part of the fair. If a merchant was found guilty of breaking the rules, he could be fined or banned from the fair altogether. These fair courts were called ***piepowder courts***. So why were they called that?

Well the word ***piepowder*** is actually an old word for a trader – and more specifically for a traveling merchant. It is actually a French term that was Anglicized over time. The French term was 'pieds poudreux' – literally 'powdery feet' or 'dusty feet.' Traveling merchants were continually on the road, and most roads were dirt roads, so they tendered to have dusty or dirty feet. English speakers took that French term and Anglicized it to ***piepowders***. Some English speakers preferred a direct translation of the term, and for a while a trader was called a 'dusty foot' in Middle English.

Over time, those large regional fairs were gradually replaced by smaller markets in towns and cities that were open in a regular basis. As those local markets grew, some of them also established piepowder courts to regulate the merchants and keep them honest.

The growth of those piepowder courts reflects the fact that there was an increased emphasis on a system of fixed weights and measures. Those courts were usually maintained by merchants and merchant guilds, but sometimes the rules were imposed by the king himself. As we saw, Henry I had tried to fix the length of the ell to minimize fraud in the early 1100s. And, around the current point in our story in the early 1300s, Edward I adopted rules to fix the length of a variety of units. And before Edward became king, his father had tried to regulate the weights and measures used by certain merchants. Edward's father was Henry III, and Henry had tried to regulate bakeries to make sure that they didn't take advantage of their customers.

In the year 1266, Henry had issued a law called the Assize of Bread and Ale. Bread and ale were staples of the English diet. Bread was made from wheat, and ale was made from barley and other grains. This new law regulated the price and weight of the bread and beer that was sold in local markets. The prices were set in relation to the underlying price of the grains. But the important thing about this new law is that the price of bread was fixed in relation to its weight – not its size.

Before the law, bread was sold by size. A big loaf sold for more than a small loaf. But bakers sometimes deceived customers by baking large loaves with lots of air pockets. So the customer paid for a large loaf – only to get home and realize that a lot of it was just air. The new law tried to solve that problem by requiring that all loaves of bread had to weigh a certain amount – regardless of size.

Despite its good intentions, the law created a lot of problems for bakers – even for the honest ones. First of all, it was hard to bake a loaf that was a specific weight. And even when a baker did bake a loaf that was heavy enough, it would dry out over time as it sat out. As it lost its moisture, it would also lose some of its weight. So an old loaf might dry out and fall under the required weight. For one loaf, that might not be a big deal. But if people bought a lot of loaves, it started to add up, and the baker could be punished by being fined or worse. A baker who sold underweight bread could even be whipped or pilloried. To avoid this potential problem, it became customary for bakers to add a little extra to make sure that they didn't violate the law. They might add an extra slice to a loaf, and if someone bought several loaves, they might throw in an extra loaf just in case the loaves were a little underweight. Of course, this was the ultimate source of the term 'a baker's dozen.' A baker's dozen was a regular dozen with one extra item thrown in for good measure – literally for good measure. So 'a baker's dozen' means 13. The term isn't actually found in an English document until the late 1500s, but the concept had been around for several centuries prior to that.

But this does raise an interesting question. Why it is a baker's 'dozen'? In other words, why did people buy loaves or rolls by the dozen. Well, it's the same reason why people bought eggs by the dozen. Because the English currency encouraged people to buy things in that amount.

The basic unit of English money was the silver penny, and many items therefore sold for a penny like eggs and rolls. They were typically one for a penny. Well 12 pennies – or 12 pence – was a shilling. In the 1500s, a shilling coin was introduced. So a shilling coin bought 12 items priced at a penny each. And as more and more people started to use that shilling coin, merchants began to group those penny items together into groups of 12 so that they could be sold as a group for a shilling. That way the merchant didn't have to make change.
And that's when people started to buy things like eggs and rolls by the dozen. And that's also why we don't actually find the term 'baker's dozen' until the very end of the 1500s, when it became common to sell items like that by the dozen.

Now I first mentioned the fact that 12 pence equaled a shilling back in Episode 45. And I noted that that ratio was borrowed from France. And earlier in this episode, we saw that the terms ***inch*** and ***ounce*** both derive from a Latin word that meant 1/12. So the number 12 is still an important increment. Today, we still buy things like eggs by the dozen, and we still divide a foot into 12 inches. If you deal in precious metals, you still divide the Troy pound into 12 ounces. And until the shilling was phased out in the 1970s, it was still divided into 12 pence. Again, this tendency to group things into units of 12 can be traced back to France and Rome, and the Romans presumably picked up the idea from the Babylonians and Sumerians. That old Sumerian counting system with a 60 base also had that sub-group of 12. And that unit of 12 has persisted through the ages, and it's still with us over 5000 years later.

And there's one other situation where we measure and count in units of 12 and 60. That's when we tell time. We have 12 hours AM and 12 hours PM. Each hour is divided into 60 minutes, and each minute is divided into 60 seconds. And the reason why that is important to this episode is because the mechanical clock was first introduced around the current point in our overall story of English. No one knows exactly who invented it or the time or place where it was invented, but the surviving literature shows that references to mechanical clocks started to appear in the late 1200s. And the first reports of actual mechanical clocks being installed in cathedrals and bell towers appear in the early 1300s. So around the current point in our story, the mechanical clock was being introduced for the first time. And the introduction of that clock was another example of how life was starting to become regulated by fixed measurements in the 1300s. Before the mechanical clock, there was no fixed hour. But after the clock was introduced, time started to become quantified and fixed in ways that it hadn't been before. And smaller increments of time also started to become more important.

Now the modern division of the daytime into 12 hours can be traced back to the Sumerians, the Babylonians and the Egyptians. These ancient cultures used sundials to keep track of time during the day, and again, they divided the daytime into 12 equal segments. The sundials had a mark for each of those segments which later became known as ***hours***. The word ***hour*** is a French loanword, but it originated with the Greeks.

Now by dividing the daylight into 12 equal segments, that meant that ancient people thought of an hour as a fraction of the daylight. But as we know, the amount of daylight varies throughout the year. The days are longer in the summer and shorter in the winter. And since the hours were merely fractions of that time, that meant that the length of an hour also varied throughout the year. An hour was longer in the summer and shorter in the winter.

That was true for thousands of years, and it didn't really change until the mechanical clock was introduced in the early 1300s. The mechanical clock counted time in regular, fixed intervals. It didn't rely upon the movement of the sun or the amount of daylight. So the mechanical clock created the fixed length of an hour that we have today.

For a while both types of time-keeping devices existed. There were the variable solar hours depicted by sundials and the fixed mechanical hours depicted by the new clocks. Either way, the hours were usually marked by ringing of a bell in the local church cathedral or bell tower. And it became important to determine if the ringing bell reflected solar time or clock time. To distinguish the two, people started to refer to the fixed hours of the new mechanical clock as "the hours of the clock." So if the time-keeper was using a mechanical clock, the bell that rang at 9 in the morning was described as "9 of the clock." And over time, "of the clock" was shortened to "o'clock." And today, we still say "9 o'clock," even though the "o'clock" part seems a little obvious and unnecessary since we don't really use solar hours anymore.

Now as I said, these first mechanical clocks were placed in cathedrals and bell towers, and they marked time by ringing bells. At first, most of those new clocks didn't have a clock face with dials or hands, and therefore, they didn't have numbers to indicate the specific hour. But very soon, it became common to design large clocks in town squares with a clock face so people could

estimate the time without having to wait for the bells. During the 1400s, those clocks started to appear with a minute hand in addition to an hour hand. So clockmakers were starting to divide the hour into 60 smaller increments called ***minutes***. And that allowed for an even more precise measure of time. By the late 1600s, clockmakers started to design clocks that could tell time in even smaller units. Once again, the minute was subdivided into 60 even smaller increments called ***seconds***, and a new second hand was added to the face of the clock in addition to the minute hand. So were these new increments called ***seconds*** because a second dial was added to the clock to keep track of them? Well, no, not exactly. But that is the basic idea behind the term. ***Seconds*** are actually called seconds because they represent a second division of the hour into smaller units.

The concept of minutes and seconds is much older than the mechanical clock. In fact, it goes all the way back to the Roman period. If you're familiar with geometry, you know that a circle is divided into 360 increments called ***degrees***, and each degree is divided into 60 smaller units called ***minutes***, and each minute is divided into 60 even smaller units called ***seconds***. Well, the clock face was considered a basic circle, so as it was subdivided into small units, these old geometric terms were applied to the clock.

But where did the names of these smaller units come from? Why do we call them ***minutes*** and ***seconds***? Well, the Romans divided something into smaller parts, they called those smaller parts ***minuta***, which we also have in English as ***minutia*** meaning 'small parts.'

When the Romans divided the degree of a circle into 60 smaller units, this was considered the first division of the degree, and each of the smaller units created by this first division of the degree was called a ***pars minuta prima*** – literally the 'first small part.' ***Prima*** meant 'first,' and we still have that word as ***prime*** as in Prime Minister. And over time, that long phrase ***pars minuta prima*** was shortened to just ***minute*** because it was a small part.

Well after this first division of the degree into small parts, there was then a second division of each of those small parts into even smaller segments. So these new even smaller segments were called the ***pars minuta secunda*** – literally the 'second small part.' ***Secunda*** was actually the original version of our modern word ***second***. English borrowed that word from Latin. And since this was the second division of the degree, these smallest units were called ***seconds***. And that's why those geometrical units are called ***minutes*** and ***seconds***.

Well, as I noted, clocks started to keep track of smaller and smaller increments of time in the late Middle Ages, and as the hour was divided into smaller and more precise units, those Latin terms ***minutes*** and ***seconds*** were applied to those smaller time units.

Now again, all of these precise measurements of time stem from the introduction of the mechanical clock around the current point in our story in the early 1300s. And I'll have a lot more to say about the history of clocks and time-keeping terms in the next bonus episode at Patreon. So be to sure to check that out if you are a patron there.

I think the important thing to take from the introduction of mechanical clocks in the 1300s is that it was yet another example of how Medieval society was changing. Before this point, people's lives were regulated by astronomical events like sunrise and sunset. And even the concept of an hour was variable. The length of an hour changed throughout the year, and even changed depending on what latitude you were standing in. But now, with the invention of the mechanical clock, people's lives started to regulated by fixed non-changing hours. And those hours were soon divided into smaller units of minutes and seconds. This changed the way people thought about time. Their lives became more regulated by the regular ringing of the bells. Those clocks determined the exact time when the town gates were opened and closed, when curfews began and ended, when the markets opened for business, when people were expected to be at work, and when the workday ended. The average Medieval life started to be regulated and governed by these regular increments of time.

At the same time, measurements of length, volume and weight were also being defined in specific increments and regulated for the first time. And that gave merchants, craftsmen and other people a standard that they could all rely upon. Those who strayed from those standards risked a fine or even physical punishment.

These changes reflect a society that was starting to change the way it thought about measurements. The people of England were moving away from loose, relative measures that varied from region to region and person to person, and they were moving toward a society of universal standards that applied to everyone the same way. And that opened the door to a world of precise measurements and regulations.

When these developments were combined with the mathematical advantages of the new Hindu-Arabic numerals, all the tools were in place for a revolution in mathematics, astronomy, geometry and science. It took a few more centuries for those developments to be fully realized, but the foundation of those later advancements can be found here in the early 1300s.

I'm going to conclude this episode on that note. Next time, we'll turn our attention back to Edward I, and we'll move the story forward from his reign to that of his son Edward II. Those events are closely tied to developments in Scotland. So we'll also turn our attention back to the north, and we'll explore the first piece of literature composed in the Scots dialect – or the Scots language if you prefer.

So until next time, thanks for listening to the History of English Podcast.