Episode 106: Future in the Past?

**Mark:** [00:00:00] Welcome to the Endless Knot podcast

**Aven:** where the more we know

**Mark:** the more we want to find out

**Aven:** Tracing serendipitous connections through our lives

**Mark:** and across disciplines.

**Aven:** Hi, I'm Aven

**Mark:** and I'm Mark.

**Aven:** And today we're talking about the future. Woo. And it's not just because the present seems so very, very depressing. Also because we have some things we want to say about the future tense. Before we start, we very briefly want to say thank you to a couple of new Patreon supporters who have joined us in May.

So thank you very much to Kevin Lyon and Colin Lyon. And now I want to bring in the cocktails. The cocktails are very special this time, and I will explain it to you in a bit, like 25 minutes from now. Let me, let me go get the cocktails.

**Mark:** Okay, I'm seeing component parts here. [00:01:00] This is, this is a deconstructed

cocktail?

**Aven:** Not exactly. The cocktails are fully mixed, but just describe what you're seeing.

**Mark:** All right. So there are two glasses, rocks glasses, which have the drink with ice but also slices of banana. But in addition to that, there are more slices of banana on on the tray, on which the two drinks are resting, which is a a silver tray.

And as well, there are almonds and coffee beans on the tray as, as if they're a sort of additional accompaniment somehow to the drink. And there are skewers large toothpicks or small skewers resting in the drinks, waiting presumably to incorporate some of these extras.

**Aven:** All right, well, I'm not going to tell you anything about this cocktail other than its name. This is the

**Mark:** Avenvera. Okay.

**Aven:** This is the Avenvera cocktail. Go ahead and try some and you don't need to add anything else. The skewer [00:02:00] is to help you eat the banana slices if you need to. Okay. That's all it's for.

**Mark:** Let's start. It's sweet

**Aven:** now, you know, it has Italian vermouth in it, right. It also has Brandy. Okay. And it has Strega

**Mark:** Strega okay. I was going to say there's some from the name I was going to guess there's an amaro or something, but,

**Aven:** and as you say, slices of banana.

No, it's a perfectly tasty cocktail. The banana is weird, but not unpleasant. All right. I will tell you nothing more about it until the time is right. All right. So explain what we're going to be doing otherwise today. Okay.

**Mark:** So this is one of our podcast episodes based on a previous video. And that previous video, which is called Does English Have a Future Tense is itself based on previous work, what I might call THE [00:03:00] previous work. It's largely drawn from my doctoral dissertation which was called" The conceptualization of futurity in old English."

**Aven:** A fine ringing title, draws the punters right in.

**Mark:** Which was basically ,its starting point was, How does Old English, the earliest written form of the English language, how does it handle future tense constructions?

Because as you'll see the future tense is not something that was originally part of the English language. And yet they had to translate a bunch of Latin texts, which did have future tenses. And so how do the translators handle this? Both linguistically and culturally, because, it's a culture that doesn't have readily available, future tense constructions.

So were they thinking about the future tense in the same way or a different way or whatever? And so it kind of feels like I'm going back in time and [00:04:00] revisiting this topic.

It's perhaps of little surprise that my favorite, ever since I was a kid, franchise is Doctor Who. And as it turns out, my, one of my, probably my favorite movie is Back to the Future. So I've been thinking about time travel, basically my whole life. So I've, since then kind of made a career out of looking at time and language.

Both in this dissertation topic and in, other ways in my research since. So we're going to, first of all, listen to the audio from the video, right, our usual awkward way of referring to that. And then I'm going to expand on that. Or should I say I'm going to, or I'm gonna, or Imma expand on it.

I don't know. Actually I will talk about that, you know, I

**Aven:** know, but you don't get it.

**Mark:** I don't get to say it. I'm gonna, is probably most natural way for me to say it. I'm going to go into some more of the detailed grammatical background of this topic. [00:05:00] Going a bit more in detail specifically about Latin and French.

And and this is really for those of you who are like me, real grammar nerds, I'm going to talk about some really nerdy, specific grammar stuff more in detail. Now, of course this is only gonna scratch the surface. So if there are any real keeners out there let me know if this is something you'd want, but I could make my dissertation available for you to read.

**Aven:** Will send the dissertation to any interested parties and anyone who's not interested as well. Cause boy oh boy, once you've written those things, the idea of anybody ever reading it is really exciting.

**Mark:** It's apparently been referenced by someone as groundbreaking work, as Aven pointed out to me. Google scholar

**Aven:** is helpful.

**Mark:** So breaking ground on some really niche nerdy topic, but you know, that's what a PhD is for frankly. I'll take it. So, you know, yeah, if you want to read more, there it is. And in addition, I will also talk later on about the history of time keeping, which [00:06:00] is a topic that I find kind of interesting.

I don't go into any great detail about it now, but it's a topic that I might come back to later because it is a very interesting topic. And in addition to that, there will be upcoming episodes that come back to the issue of time and language. So there will be another episode that will deal with my more recent research into spacetemporal metaphor.

 And, and so that's like really up-to-date stuff that I'm researching as well as several episodes that will deal with sort of the calendar and related subjects. So lots of, lots of other timely content to come

**Aven:** in the next year or two. Yeah.

**Mark:** It'll take a while. But over the next yeah, year or two you'll, there'll be more episodes on time.

So w we'll we'll keep coming back to this.

**Aven:** Okay, good. And I've got some other things to throw in, but not a lot. And I will explain the cocktails. I'm so excited about the cocktails. So for now, let's listen to your [00:07:00] discussion of the concept and grammar of the future tense.

**Mark:** Okay, you’ve probably always been told that there are three tenses, past, present, and future, right? Like I loved, I love, and I will love. So why am I telling you that English has no future tense? Well, in Old English, as was true with all the older forms of Germanic languages, there wasn’t a future tense at all, there were just two tenses, the past and the present, or more properly the past and non-past tenses, since you would use the non-past, what we conventionally call the present tense, for indicating both present actions and future actions. We can still do this in Modern English, like saying “I go to the doctor tomorrow”. And in subordinate clauses we never use the future tense, as in “If it rains tomorrow…” never “If it will rain tomorrow…”. But if we want, we can specify that the action of a verb is in the future by using auxiliaries such as will and shall, as in “I shall stay home” or “He will go to the [00:08:00] doctor”. So can we call these constructions future tenses? Well, maybe, but there’s a lot of disagreement on this point. First of all, as we just saw, the future tense isn’t grammatically required to express the future, we can simply use the present tense forms. Furthermore, if we look at the etymology of the auxiliaries used to form the future constructions in English, it appears that they may carry other meanings in addition to future time reference. So will comes from Old English willan, which generally meant “to wish, desire”, though already in Old English willan was just beginning to be used to express futurity. It goes back to a Proto-Indo-European root with largely the same meaning. One cognate of will is the word volition, which comes into English through Latin. So some would argue that even today there is some slight element of wishing or volition in the Modern English auxiliary will. Similarly, shall comes from Old English \*sculan which meant “to be obliged, have to, must”, and again, although it was already beginning to express futurity in Old English, [00:09:00] it can be argued that even now it still has connotations of obligation or necessity. Willan and \*sculan are part of a set of verbs called modal verbs which express mood or modality, in simpler terms elements of possibility, obligation, permission, ability, and so forth. Other modal verbs in Modern English include can/could, may/might, ought and so forth. They all sort of qualify the action of the main verb in some way. One way of thinking about the future, then, is as occupying the intersection of tense and modality. And the word future itself, by the way, comes from the Latin futurus, the future participle of the verb to be which comes from the Proto-Indo-European root \*bheuə- “be, exist, grow”, which also gives us the English verb to be. Which makes sense, since these English ‘will’ & ‘shall’ forms were called the ‘future tense’ by grammarians who were trying to fit English grammar into the model of Latin verb forms, even thought they [00:10:00] don’t really work the same way.

But here’s where the interesting connection comes in, which will take us on a trail that will eventually lead back to our English future construction. At the same time as will and shall were first starting to be used to to express futurity in Old English, there was an ongoing philosophical debate most explicitly expressed in a highly influential late Roman text, which was often read, recopied and translated in the middle ages, Boethius’s Consolation of Philosophy. The debate was whether people had free will or whether the world was governed deterministically, in other words did God predetermine all of creation in one go. It’s all kind of about the nature of future events. Boethius comes down on the side of free will. But the important thing to notice here is that the two options in this philosophical debate, free will vs determinism, parallel the two modal connotations of our two auxiliaries, willan expressing volition, or free will, and \*sculan expressing necessity, or determinism. When the [00:11:00] Old English scholar-king Alfred the Great translated the Consolation of Philosophy into Old English, he was very careful how he employed willan and \*sculan, with attention to their modal connotations. Now of course it’s impossible for me to summarize the entire history of this debate, which still rages to this day, with such questions as to what degree do our own brains predetermine our actions, and is free will simply an illusion. But I want to point out one particular stop on this path, the debate between Catholic Erasmus of Rotterdam and Martin Luther the founder of Protestantism. Because you see this was one of the sticking points between the Catholic tradition and Luther’s fledgling Protestant Church, whether salvation was a reward for your actions in life or a predetermined gift from God. In a series of writings aimed at one another, Erasmus and Luther debated this question, Erasmus on the side of free will and Luther on the side of determinism. You see the Catholics, believing in free will, not only accepted good works as a way into heaven, but also took to selling pardons, basically get-out-of-Purgatory cards, in order [00:12:00] to make a little money for the church. Luther thought this was corrupt, and figured only the elect, previously chosen by God, get into heaven. What you did during life wasn’t the cause of your salvation. So thinking about the future helped to start the Protestant Reformation.

Getting back to King Alfred, he also translated one of the philosophical works by St Augustine of Hippo, the Soliloquies, basically an inner dialogue which explores the nature of the soul, that doesn’t get very much into matters of time. But another of Augustine’s works does. The Confessions is essentially an autobiography, in which Augustine describes his misspent youth as what we would now see as a troubled teen from a good family who acts out in a variety of antisocial behaviours, the whole wine, women, and song routine. Some things never change, I suppose. In his Confessions he famously encapsulates his feelings at that time with the line “Grant me chastity and continence, but not yet”. Eventually he cleans up his act and converts to Christianity, becoming one of the Four Fathers who basically [00:13:00] established much of the groundwork for the Western Church as we know it today. His autobiography ends with some reflections and commentary which we might now recognize as an early attempt at cognitive science, when in book 11 he turns his attention to time and how we perceive it. He starts off with an oft-quoted statement about the difficulty of discussing the subject, musing “What is time then? If nobody asks me, I know: but if I want to explain it to someone asking me, I do not know”. Well, I know I often feel that way, so again some things never change. He then goes on to discuss the very familiar and conventional three-part way of looking at time, with a future that in the instant that is the present is converted into the past. As we’ve seen, this three-part division isn’t the only way of looking at it. But for Augustine writing in a Roman, Christian context, this is pretty standard. The Latin verb system has three tenses, past, present, and future, and the Christian sense of history moves inexorably from Creation to Judgement Day. But the particularly clever bit is what he does next. He [00:14:00] collapses all three times to cognitive operations in the present moment: “It is now clear and plain, that neither things to come, nor things past, exist. Nor do we properly say, there are three times, past, present, and future; but perhaps it might be properly said, there are three times: a present time of past things; a present time of present things; and a present time of future things. For these three such things are in our souls; and I do not see them elsewhere. The present time of past things is our memory; the present time of present things is our sight; the present time of future things our expectation.” So that’s another way to think about the future, expectation and prediction. By the way, it’s not entirely clear whether Augustine sided with the free will camp or the determinism camp, but the Protestants certainly read him as expressing a deterministic viewpoint and adopted him as a kind of grandfather of the Reformation.

But what is clear is that this all comes down to how you divide up time. And that makes sense, given the etymology of time. [00:15:00] The word time originally meant a “limited space of time”, traceable back to the Proto-Indo-European root \*da- meaning “divide”, which came into Old English as tima. Tide, tid in Old English, also descends from this same root meaning originally a “time or season” as in Yuletide. Time gained its modern abstract sense of “time as an indefinite continuous duration” only in the 14th century. Tense, on the other hand, is a tricky one, but according to one proposed etymology may have to do with dividing up. First of all there are two words tense in English, which may or may not be etymologically related, tense as in a verb form, and the adjective tense as in tension. What seems immediately clear is that tense comes from Latin tempus, which also means “time”. This Latin word may come from the the root \*tem- meaning “to cut” so in other words a segment of time. Or it may come from the root \*ten- meaning “to stretch”, so a stretch of time. And related to these tense words, [00:16:00] or maybe not, are the words temporal and temple, which both also are two separate words in modern English. Temple can mean a place of worship or the area on the side of the head. Temple the place of worship may come from the \*tem- root from the notion of a space “cut out” or therefore “reserved” as a place of worship, or it might come from the \*ten- root from the notion of stretching a string to measure out the area for worship. The other word temple, the area on the side of the head, may come from the stretching notion because of the skin stretched out over that portion of the skull, or it might come from the idea of time, as in the appropriate time, in other words the right place, for dealing someone a fatal blow. What’s more we have the two words temporal with the same set of confusions, temporal referring to time, and temporal referring to that part of the head, most often used to refer to what lies underneath that spot, the temporal lobe of the brain. Complicated etymologies, but we better move on or we’ll run out of time!

[00:17:00] Speaking of the temporal lobe, though it doesn’t specifically have anything to do with time, one of its functions is language processing, specifically in the area known as Wernicke’s area, named after Carl Wernicke, which is responsible for language comprehension as opposed to language production which is handled in Broca’s area in the frontal lobe. It also turns out that there doesn’t seem to be one time centre of the brain, but rather many distributed systems, one of which is the suprachiasmatic nucleus, a tiny region in the hypothalamus which regulates the daily circadian rhythms. Other brain areas that are particularly important for our purposes are the frontal lobe and prefrontal cortex which are implicated in planning and voluntary action, operations in the domain of the future. This sounds a lot like Augustine’s present time of future things. And what about Augustine’s present time of past things, which he sums up as memory? Well that’s also a crucial function of the brain, particularly the hippocampus, originally literally horse-sea-monster, then subsequently used to refer [00:18:00] to seahorses, and then to the brain region because of its similarity in appearance to the seahorse. The hippocampus is part of the temporal lobe, and is involved in converting short-term memory into long-term memory. And as it turns out, memory may play an important role in thinking about the future. The human brain seems to be uniquely capable of what is called mental time travel: remembering the past and predicting the future. What’s more, we draw on our memories for the raw material for constructing possible futures. Brain imaging shows that remembering and imagining the future use very similar regions in the brain’s frontal and temporal lobes. We may have developed mental time travel, as well as language, for the evolutionary advantage it gives in being able to plan future actions.

Now sticking with the scientific approach, specifically as it applies to prediction, there is the field of future studies or futurology, an interdisciplinary field about predicting the likely futures we may encounter, based on looking at past and present trends and extrapolating into the future. Science [00:19:00] fiction writer H.G. Wells is often considered the father of futurology, which grew out of the book Anticipations of the Reaction of Mechanical and Scientific Progress Upon Human Life and Thought: An Experiment in Prophecy published in 1901 and a Royal Institution lecture he delivered in 1902 and later published called The Discovery of the Future. In addition there was also an early twentieth century cultural movement that had ideas of the future at its core, Futurism.The Futurists, primarily a group of Italian artists, writers, musicians, architects, and even cooks, looked to the future with excitement and optimism, and to the past with contempt, valuing speed, machinery, and violence, led by the founder of the movement Filippo Tommaso Marinetti who wrote a Futurist Manifesto. In the 1920s and 30s futurism became entwined with fascism and Marinetti even founded a Futurist Political Party in 1918, which was absorbed into Benito Mussolini’s Fascist party a year later. Mussolini championed one of the tenets of futurist [00:20:00] cuisine: replacing pasta with rice in Italian cooking. Mussolini wanted to ween Italy off of its dependence on imported wheat and onto domestically grown rice. And it can be said that Mussolini not only valued violence, but also machinery and speed, as per the old cliche about him that “at least he kept the trains running on time”!

And Mussolini takes us to World War II, where we also find another notable figure in the pantheon of time. If European fascism started World War II, science was there at the end of it, with the invention of the atom bomb, which might have been built first by Germany had Albert Einstein along with fellow scientist Leo Szilard not sent a letter to President Roosevelt urging the US to start what became known as the Manhattan Project. Of course Einstein is most well-known for his theory of relativity which cast doubts on the possibility of time travel into the past but showed the way towards time travel into the future. He is also known for his work on quantum physics, becoming dissatisfied with the probabilistic direction quantum physics was taking, [00:21:00] preferring instead a more deterministic universe, famously stating “God is not playing at dice”.

But to bring our story back to its linguistic starting point, determinism and relativity also have important meanings in the field of linguistics, specifically linguistic determinism and linguistic relativity, also known as the Sapir-Whorf Hypothesis after 20th century linguists Edward Sapir and Benjamin Lee Whorf. The idea simply put is that the language you speak and its characteristics either determine as per linguistic determinism or in the weaker form of linguistic relativity influence the way you think and perceive the world. This hypothesis is a matter of hot debate currently among linguists as to what extent language does, or doesn’t, influence thought, and this debate is largely localized in the category of time in language. Whorf, incorrectly as it turned out, believed that the Hopi language, spoken in what is now Arizona, had no concept of time, and so he surmised that the Hopi were unable to think about time in the same was as for [00:22:00] instance an English speaker does. That’s linguistic determinism. Since then other scholars have picked up on the idea, such as medieval scholar Paul C. Bauschatz in his 1982 book The Well and the Tree: World and Times in Early Germanic Culture, who claims that as early Germanic languages like Old Norse and Old English had no future tense, merely past and non-past, speakers of those languages would be unable to think about the future, a concept that they only gained through interaction with Christian culture and the Latin language. These are strong claims that many don’t agree with. More recently economist Keith Chen claimed in a 2013 article that whether or not a language has a future tense distinct from its present tense can affect future-oriented behaviour, such as saving money for the future. Basically his argument goes “languages which grammatically distinguish the present and the future may bias their speakers to distinguish them psychologically, leading to less future-oriented decision making”. So how we categorize our English future verbal constructions might have an influence on how we [00:23:00] think. However, after much criticism, Chen has backed away somewhat from his bold claim, while weaker forms of linguistic relativity have been tentatively identified by some cognitive linguists. But this controversial subject is definitely a topic for a FUTURE video!

**Aven:**

And in fact, you've actually did come back to that one for once, when you've promised future videos, you haven't always carried through, but that is one of the ones we will be talking about. This spatiotemporal

**Mark:** metaphor stuff. I do keep coming back to the topic of time and language, because it is my obsession

**Aven:** and also linguistic relativity and

**Mark:** linguistic relativity.

Another obsession.

**Aven:** Yes, but that's for another day. Okay. Now I can explain the cocktail. So this cocktail, sir, is a Futurist cocktail.

**Mark:** I was wondering that, you know, what could possibly be weird, you know, weird surprise. And so there is that culinary element of the futurism.

**Aven:** Yeah, so, you mentioned the futurists who of [00:24:00] course are horrible fascist people.

So, you know, the fact that we're making a futurist cocktail just for the record does not mean I approve of or are excited by the futurists, necessarily

**Mark:** Boooo Mussolini.

**Aven:** Yes. But that said, one of the things about futurism was, I'm quoting now from a website that I will, there was a bunch of stuff about this, but I'm reading from an article on the whiskey exchange .com.

I will link to that. "The core of futurism was a love of the modern and a rejection of the past. And with Italy's strong food and drink traditions, it was only natural that a new approach to those would be part of the movement's ideals". And as you said, like the stuff about pasta, doing rice because they could grow rice and they couldn't grow enough wheat.

So Mussolini was very concerned with specifically Italian foodways. That was an important thing. What were are they going to eat? And the futurists were too in different ways. And they put out futurist food and drink, "the first work on futurist food and drink was La Cucina Futurista, the futurist cookbook, by Filippo Tommaso Marinetti, founder of the movement, published in [00:25:00] 1932, mainly concerned with food, but it also contained the seeds of the futurist approach to drinks". It was all about the artistic side of cooking and an obsession with appearance, with elements of dishes created just to be seen and smelled and the surroundings and influence on the experience. "As part of the reconstruction of the gastronomic world they renamed elements of the menu, using traduie rather than sandwich, peralzarsi, I can't say Italian, instead of dessert, calling their cocktails, polibibite, multi drinks, many drinks". The environment for the development of polibibite was very restrictive. So you had the great depression after the Italian invasion of Ethiopia in 1935, there were trade embargoes.

"So for nationalistic futurists, this pushed them to using predominantly Italian ingredients, but fitting in with the movement's ideals, using them in new and untraditional ways. They mixed drinks that were usually drunk on their own, added non drink ingredients, and generally disrupted the concept of the traditional cocktail".

So they divided polibibite into six categories based on what the drinker was [00:26:00] intending to do after consuming the drink, rather than based on what they were doing while having it. So not what food you're pairing with it, what you're going to do next, what it was going to prepare you for. So the per mangiare was for eating, so aperitifs, right. Guerra in letto, War in bed, was to get you ready for sex, because they were very keen on families having children. Yeah. Pace in letto, peace in bed, was warming to give you a good night's sleep Presto in letto, fast to bed, was to put you to sleep really fast, like heavy alcohol, right. Snebbianti, a fog dissipator, a strong cocktail to remove conformist thoughts and open the mind to new ideas. And Inventine, inventive, a very alcoholic cocktail to unlock the mind's potential for invention and problem-solving. Now in their recipe books and descriptions they didn't give full recipes because the whole point was this sort of artistic nonconformist way. But so I have followed a recipe that has been sort of constructed out of this description, but I will read the description of this particular drink. "The cocktail itself [00:27:00] has a mix of vermouth, Italian Brandy, Strega, and sliced banana poured without measurement and then combined however the bartender wanted. The glass was served on a polished metal platter, surrounded by Ethiopian coffee, bananas and almonds representing Italy's overseas colonies. And," and I did not do this, "tomatoes anchovies and Parmesan cheese, standing for the country's homegrown produce." I didn't have those in easily, I could've, I decided against the anchovies, which is the only bit I could have done. " To accompany the drinking experience someone might regularly beat a sonorous sounding gong, someone else might spray perfume behind the drinkers, and there would be an opportunity to handle textured materials, sand paper, wood, metal, soft, and rough fabrics to make sure that the sense of touch is being properly stimulated."

So there were a whole bunch of other recipes that I found all of which were more weird or terrifying. And one of them had a cooked egg yolk sitting in a sweet drink. Anyway, this one was the only one that was a) achievable and b) sounded like I would drink it. So

**Mark:** this obviously has [00:28:00] had continuing influence

**Aven:** well, "in short, it makes Hester Blumenthal's dinner parties look tame" is what this article says, right?

Yeah. Well, I think it may be, I don't know if it had continuous influence, if you see what I mean, like I think it kind of stopped being a thing, but. But I don't know if they're doing that deliberately with futurist, but yeah, it's, it's in many ways seems very ahead of its time, but that's the twenties and thirties were like that lots of stuff happened, then

**Mark:** That's the point if you're a futurist, right? And you're

supposed to be looking ahead of your time,

**Aven:** but yeah, a lot of stuff got put in back in boxes for the forties and fifties and sixties. Right. So what I have presented you with therefore is an approximation of this. We didn't have Italian Brandy, I used the wrong vermouth, but you know, it was an Italian vermouth.

So it's 30 ml Brandy, 30 ml vermouth, and 10 ml Strega. I doubled them. And then slices of banana. And I was able to put three of those, the overseas colonies are represented on the platter, but not the Italian food. So it's a perfectly nice drink, but really the [00:29:00] drink is not the point. The presentation is, and the history and the concept and the idea of it.

So I was so excited when I found that. I mean, there are a few other cocktails that have the word future in them or whatever, but I just thought, no, this right, this is a future cocktail. This is exactly it. So

**Mark:** well, that's very cool. And it occurs to me though. It's interesting that they call it poly-bibite rather than multi-bibite, because that poly is the, the Greek prefix

**Aven:** I guess it came into Italian.

I mean, I don't know enough about how Italian forms, whatever, but it must have made it into, you know, become a naturalized Italian word or prefix would, which wouldn't be surprising because so many of those words come into Latin. All right. Switching gears. The one thing I wanted to talk about a little bit in reference to other things you brought up before you talk more about the grammar was the concepts of the future. So you talk obviously about that with the Germanic and the Latin. Yeah. And [00:30:00] the sort of, not clash necessarily, but the, the meeting of those two particular conceptions of time, but the Latin conception of time, you're talking about is a late antique/Christian conception of time that has, is founded around Christianity and its theological sort of implications of time.

So I thought I might just talk a little bit about some of the ideas about time in the ancient world. pre-Christian. Specifically really, I'm just going back to Rome, though whenever you talk about Roman philosophy, you're talking about Greek philosophy too, right? There were many, many different conceptions of time because there are a lot of different philosophical schools and approaches, but I thought I'd look at it a little bit through the lens of Virgil's Eclogue 4, the messianic eclogue, because that one kind of brings together a bunch of these ideas, not in a coherent thought out philosophical way, but it kind of touches on a bunch.

 And this is talking about the conception of time in the sense of the future, like where is the world going? And how does the movement of time work? There was the astronomical concept of [00:31:00] the magnus annus, big year. Cicero talks about this in his Republica.

This is the period between successive occurrences of all celestial bodies being in the same positions. Right. So right. This is a little bit like the Mayan calendar, the idea of like everything coming back to the starting point. Hence therefore, that's a cyclical idea. Now that doesn't necessarily conceptualize time as, the world is ending and starting again or something like that.

But this idea that sort of the time does move in a cycle that it comes back to the beginning and it starts again,

**Mark:** I mean, in many different cycles, on many layers, and this is the big

**Aven:** one.

This is the big one. Exactly. Like there's lots of little cycles, but this is the big one where it all lines up again, and then it starts again. There's the Stoic idea of the periodos, period, which is sometimes combined with the magnus annus. And this periodos is the time between successive conflagrations that destroy the world or the universe. In the stoic cosmology, this is not as a punishment, like apocalypses in [00:32:00] other concepts.

But as an expression of the world's essential divinity, it basically reaches its summation of the creative fire of the cosmos. So it's kind of a culmination of its divinity really. And then it would because it's the creative fire of the cosmos, it will start again. So the world ends in fire and then begins again in fire.

So again, a cyclical idea. So sometimes that idea of the astronomical concept is connected with the Stoic idea, to say that the periodos is the magnus annus, that when everything comes back to reset, the world will be destroyed and restarted. Then there's the Orphic doctrine of the world ages each ruled over by a different God.

So Saturn, Jupiter, Neptune, Pluto, and finally, and to come, not yet here at the time Apollo, that would also end with a conflagration. Now it's unclear in our extant sources, whether that was thought of as a cyclical, a repeating sequence, or as a one-time only, whether it's teleological or, cyclical is not clear. Orphic [00:33:00] stuff was mystery stuff so it often is not clear in our sources. There's a Roman concept that was probably Etruscan, cause a lot of these things are Etruscan, but again, hard to tell, of the saecula. The saecula is the period of time it takes for all members of one generation to die. So that saecula begins when nobody is alive, who remembers the last saeculum that was marked right. Towards the middle and end of the Republic it was formalized as 110 years as being a saeculum.

 And there's a concept that nation's natural life cycle is 10 saecula. Okay. The rise and fall of people, right, right. So Rome or Greece or whatever .Again, not necessarily completely cyclical, cause it's not like you go back to the beginning and Rome starts again or something, but this idea of repeating patterns, and of course there were the secular games that happened.

There's also the concept of the ages of man from the golden age down to the iron age, either golden, silver, iron, or golden heroic, [00:34:00] silver iron, sometimes bronze is in there. Two different versions found in Greek myth and Hesiod, and it's also in the elsewhere in the Mediterranean. So we see it in Babylonian and near Eastern mythology. In Italy the golden age is often connected with the reign of Saturn or Kronos who after his overthrow, by Jupiter fled to Latium and ruled the last, so the golden, the last sort of gasp of the golden age was in Italy according to that story. In Eclogue 4, so the Eclogues were a collection of poems. The first collection we have by Virgil written during and to the end of the civil war between Octavian and Antony, before and after and during that period of time, so around 30 BC probably is when they were finished. He suggests the idea that they might be in the iron age. And it can begin again with a golden age. So Eclogue four is about the coming of a new golden age. This is not found elsewhere in the extant sources.

So we don't see that idea of a [00:35:00] restarting elsewhere. That doesn't mean it didn't exist. It doesn't mean Virgil came up with it alone, but it might've been his new concept. He brings all of these ideas, basically that I mentioned in one way or another, he alludes to all of them in Eclogue 4, not, as I said, in a coherent full theology or cosmology, but he references a bunch of these different ideas of changing ages.

cycles of change, rebirth regeneration restarting in Eclogue 4, he also brings in of course the apocalyptic figure of the divine child, maybe born to a Virgin, it's not entirely clear the way he puts it. But of course that's how the Christians took it later, but in the actual poem, it's not that clear.

There is a Virgin mentioned, it's not clear that's the mother of this child. That idea is very common in near Eastern and Jewish sources. So it's quite possible he took them from Jewish sources though that's all speculative, we don't have direct connections, but there's a lot of the stuff floating around exactly.

It's hard to know where he took it from, [00:36:00] but he doesn't show us a concise, like a concept of the future, but he does bring in all of these ideas of the ending of one and the beginning of another. And for him, it's the beginning of a new golden age. That's going to be a gradual bettering of the world, which is in many ways a reversal, because what we've seen in Greek and Roman thought, there's this idea in general of degeneration, right?

Where stoicism for instance is unusual is in the idea that this will start again like that there's a restarting that this'll be an ongoing cycle. The ages of man is usually portrayed very much just as a basic total degeneration to misery. So Virgil is kind of putting these all together to say it has been down.

I mean, he's been going through yet another civil war, civil wars forever and ever. Eclogue four is all about the hope for the rebirth, the new golden age that will bring peace and prosperity and many colored sheep, which is the most important part of the golden age. So that's what we have in Virgil. The other piece, I just wanted to mention this.

It doesn't really talk [00:37:00] about future, but I think it's interesting to you for other reasons. So I thought that that just mentioned it. Lucretius is another person. He, he writes of course the de rerum natura, which is an Epicurean philosophical text written as an an epic poem. And so if you're going to look for philosophical ideas, you might as well look there and he does talk about time.

He has a sort of basic cyclical view, not again, formalized or worked out, but, but his cyclical view is because it's atomic theory, death and decay are necessary prerequisites for new creation because death is the dissolution into the atoms, right? And you need that so that you can have the atoms for recombination into new life.

So that's a cycle, but it doesn't deal directly with the idea of cosmic time and that kind of thing. Okay. Because the whole idea is that everything's accidental in a sense, right? The accidental meeting of atoms So that sort of larger theme does not make sense, but I thought you'd be interested in, he does talk about time. Lucretius defines time as an [00:38:00] accident of motion: Tempus item per se non est time itself by itself does not exist. Right? It is motion that causes time, which of course is something

**Mark:** the modern physics way of looking at it is that time is just a by-product of Thermodynamics

**Aven:** Yeah. Yeah. So, no, it's, it's, I mean, as always the atomic theory of the Epicureans is really interesting. And I have two articles that I will also link in the show notes if people want to read more, but, and I'm quoting from one by Gisela Berns: throughout Lucretius's philosophical poem, time is spoken of as space as motion and as force. And this article is asking the questions, what is the connection between these three different metaphors of time between time as space? Time as motion and time as force. And two, what is the common ground for this poetic view of time and the philosophical definition of it as accident of motion?

And I just thought, I'd mention that to you because the fact that this article and [00:39:00] seems like quite a few discussions of Lucretius about what metaphors he uses for time that have to do with motion and space. I just feel like I should point that out. It's

**Mark:** very much the, the topic that I'm researching now is how time is figured in language in terms of space and motion.

**Aven:** Yeah. So I have no idea. I did not look further to see if this is really relevant or not. I just thought I would point that out to you and I can give you the references later. You can look into that because it does feel like it's you know, because that's as I said, this is a precursor it's not relevant to your discussion of how time metaphors develop an English because I doubt that this is a distinct, at what point are they reading Lucretius? Exactly. When it is, it's never popular, like it's probably not an important factor in how English developed its concept of, of time. Nonetheless, it might be interesting to you. So that's all, that's what I wanted to talk about for futurity.

Right.

**Mark:** Interesting.

Well, [00:40:00] now I think what I want to do is kind of go back to real basics here and talk about some of the nuts and bolts of grammar and how it handles tense, verb tense. And so as a comparison to the, English futural constructions, it's useful to look at how tense works in a language that certainly does have a grammatical future tense, right?

Namely Latin, which is a language that had very specific influence on English. So for the verb armare, to love, the present tense in the first person, singular would be amo, I love. To make it a future tense, you add a different ending, so that O ending is the present tense first person singular.

So you change that ending and you get amabo, I will love. So one word on its own can express the basic idea of futurity in Latin. Right? [00:41:00] All you need is that one word and change the format of one word. And it changes that idea. Yeah. Unlike English, where it would be will love where you have to have two words to do the job.

Though, I will say it's, not a necessary conclusion that a form being, produced with a single word. It isn't necessarily essential to grammatical tense as a concept.

So as we'll see, there's a lot of going back and forth between one form and two words as, as languages develop. so let's then jump forward from Latin to one of its descendant languages. And I'll use French because that's the one I know, but this is more or less true of other romance romance, languages that come from Latin.

So in French because there were some sound changes that happened as you go from Latin into what's called vulgar Latin. So a sort of, later development of Latin.

So a certain sound change happened that made it difficult to [00:42:00] distinguish between that future tense, so amabit, let's say, she will love, and the past tense amavit, she loved.

**Aven:** The B becoming the V and the V becoming a V. Yeah. So, because it used to be amaWit, that was pretty clear. Once it became amaVit, it involves the, the lips, it's very close it's very and the B was probably softening too.

Yeah. So.

**Mark:** That obviously causes the potential for misunderstanding. If you can't tell the difference between the past tense and the future tense. So that pressure caused the development of something more clear. So vulgar, Latin dumped the one word future tense and started using an auxiliary verb.

So now we're into two. Yeah. A compound. So two words to make the future tense rather than one word. And so specifically they use the auxiliary verb habere, to have, to form this new futural construction as in amare habeo. So literally, [00:43:00] I have to love, I guess, but really it meant I will love. Then what happened was that the auxiliary Habeo got kind of simplified, and this is the thing that French really does. all the romance languages do to some extent, but French was really great about dropping consonants,

**Aven:** dropping as many syllables as possible, and then making the rest silent.

Yeah.

**Mark:** So that Habeo was no longer, you know, very clearly pronounced, pronounced it got simplified and then glued on to the end of the main verb, the infinitive amare. And so eventually what that produced, is in modern French anyways j'aimerai

**Aven:** aimerai. Yeah. aimerai. Yeah, the 'je' is the pronoun, yeah, yeah.

**Mark:** I will love, which is how, the French speaker today would say it.

So that 'erai' is from 'habeo' the

**Aven:** the 'ai'. Yes. Yeah. The 'er' is from the infinitive presumably, right? [00:44:00] Yeah.

**Mark:** Yeah. So we're kind of back to where we started with one word expressing the tense. The funny thing is, in addition to this one word feature tense, which is called the futur simple in modern French grammatical terminology French also developed another future construction.

So there are two different features and comprehend feature which is called the futur proche, with the auxiliary verb aller, to go. So je vais aimer, I will love, I am going, I'm going to love literally.

**Aven:** Is this where I get to rant about Duolingo? No, I know that it's coming. I just want to know when,

**Mark:** so the distinction between these two different future tenses, futur simple and futur proche, was originally about how distant a future you wanted to talk about.

So as the name [00:45:00] suggests futur proche was for the near future, something that is going to happen imminently and the futur simple was for a more distant future. But really today, the distinction is more, one of formality, so less formal for the futur simple and more formal for the futur proche.

**Aven:** Futur proche is more formal, more formal, huh? I, in talking to my child, for instance, he only uses the futur proche

**Mark:** well. And I wonder if that is dependant on dialect?

**Aven:** Well, I don't, I don't know, and context, same with me when, when, when I learned like in learning French, and this is very much as an Anglophone in Ontario, so I'm a hundred percent not trying to say this is how French works.

Right.

**Mark:** So neither of us are, native French speakers. No,

**Aven:** at all. So I can't, I mean, I've spoken French my whole life. My French is decent, but I have no intuition about it necessarily. Or at least I wouldn't trust my intuition, but I would say that in spoken French, I [00:46:00] hear and expect, and certainly use the aller plus the infinitive all the time and very rarely use the futur simple.

**Mark:** well, maybe that's because we're sort of taught more proper French. Okay. I

**Aven:** think it's just because it's easier and it's much easier as a form to learn. Right. Because you learn the aller and then you just stick the infinitive. Yeah. But if anyone listening grew up speaking French and has a strong intuition about it, I would like to know.

I mean, I'm not, I'm not denying what you're saying. It's just does not match with my experience, but my experience is in a French as a second language. So, well, that's

**Mark:** what I've read, grammarians say about, but, but you know, that

**Aven:** means, and maybe, maybe it's true in France and not true in Quebec.

These are also things that are hard to know.

**Mark:** So now if you wish to

**Aven:** well, it's, it's not really about Duolingo other than I am doing French Duolingo to refresh my French and Duolingo is just, you know, it's an app, so it can only be as smart as it can be. And [00:47:00] sometimes it's overly persnickety about how you translate when there are multiple translations. I will say it's pretty decent about allowing multiple possible translations, but sometimes it's not.

And I got thrown by, it would not let me translate equivalent of 'j'aimerai' as I am going to love. and then when I complained about this on Twitter, because I could not, like, I genuinely had no idea why it was saying I was wrong. I was like, it's the future? I know it's the future. I translated it as the future.

And people said to me, no, you could only translate 'je vais aimer' as 'I am going to love', because that's not a real future. so clearly they were being taught 'je vais aller' is not future. It is. I am going to love a present. Cause people said, I don't know, because you can't translate "j'aimerai' as I'm going to love because there's no verb for 'going'.

Yeah. And like, it was interesting to me that that was can more than one person said that they said, no, you can't. [00:48:00] That would be 'je vais aller' because that has the verb for going in it. So clearly that is how it's being taught. And my brain was like, that's not how this, that's not how any of this works. I don't understand.

But just to say, I was told by various people that futur proche, that the people who have been taught how to translate are taught, that "je vais aller", or "je vais aimer" has to be translated. It has to be translated as I am going to love. And "j'aimerai" has to be translated as I will love that that's the only actual future. And that's what they're taught.

**Mark:** Well, and there is an argument to be made. No, this may be the opposite argument though, that I will love in English is not as much a purely futural construction as I'm going to love. That's the opposite. It's the opposite. But there is, I think some, and I think it's more complicated than that. And I haven't really looked beyond the medieval English.

So, but there, there are differences in when you can [00:49:00] use, I will love and I'm going to love. Yes, but I

**Aven:** will just also point out that those are not the only two future constructions in English, and we can come back to this point and we should.But like, I shall love. I am about really future proche seems to me if the, if the whole point is how close it is, it should be only be I'm about to love, because that's the much more, that's how you say in English.

If you want to say like, this is happening now, there's lots of different ways of the future and the idea that there's a one-to-one correspondence between the two verbs is what, and what I realized after that conversation was that I was never taught to translate French, right? Because I learned French in a sort of, it wasn't an immersion, but it was an immersive approach where we only spoke French in the French classroom. When we read French and when we did our French grammar, we did it in French and I was never taught any rules about, this is what the English equivalent of this French is because we weren't allowed to speak English in our class, in our classrooms. So a lot of the people who were responding to me were either Americans or British people who learned, who learned as [00:50:00] a second, learned it very much as a second language with like, here's how to do, here's what the English translation for each of these things is.

So I'm not saying they're wrong, but I was very genuinely, completely baffled by that. Like never once had I ever conceived of there being some like formalized difference between those. I mean, obviously I know they're two different forms in French but like, to me, I also thought of them as formal.

But reversed, I thought of the aimer as the informal spoken way and that when you were writing, you'd be more likely to say "j'aimerai". So anyway, I just found that whole thing fascinating, you know, frustrating, cause I got something wrong in Duolingo and I was mad at that, but mostly fascinating and it was interesting to hear people saying, oh, no, this equals that. When I know that that's not how the future tense works in either language, right. It's not so simple.

**Mark:** It may just be a question of

**Aven:** you give them rules. And I looked at the resolved tense has

**Mark:** [00:51:00] to be equivalent to the resolved tense.

And the one word has to be equivalent to the one

**Aven:** word, except it's not one word. We have no one word future in English. That's the whole point. Right? So they're both compound in English. It's just one of them has a bare infinitive and one, has a full infinitive. So whatever that's the thing, there is no easy equivalent, but I do understand making these rules.

And when I looked it up on the internet, it was quite clear from like French learning sites that this is a rule. This is the way it's taught. I get that. I just had never seen it. I'm sure I've seen them translated that way in grammar texts, but it because I don't think of those as different things in English.

I don't think as I'm going to love, and I will love as being like formally different. I know that I would use them in different places, but I don't think of them as being formally different futures, well, and

**Mark:** this is the thing is that, you know, in language the idiomatic use of tense, construction, or really any construction grammatically is.

So much more subtle than

**Aven:** here's a rule, follow it. So [00:52:00] I, because, you know, I may have seen them always translated that way, but it would never have twigged to me that, that, like, I would never have noticed the pattern because those are equivalents in my head or not full equivalents, but you know, equivalents that are so complicated when I use one or the other, that I would never think of them as being, it's not as simple in other words, as for instance you know, in English I have seen, or I had seen to me, those are like, yes, I can see those as completely different categories.

Those are different tenses. They mean different things. I have no problem saying that. Of course you can only translate the plus que parfait with had. Right? Sure. Totally agree. Because to me that's completely different tense. Whereas those variations on the future are just different ways of saying the future yeah.

In English. So anyway, that's well to say, this is what the complexity,

**Mark:** and I'm curious to know how, it's taught in ESL courses, right.

**Aven:** Are they taught formal distinctions between these different future forms, but

**Mark:** I, certainly can't remember any time that I was ever told, you know, when to use, [00:53:00] I will, as opposed to I'm going to or

**Aven:** anything like that, that I will, and I shall was probably taught at one point, which is a fake rule.

No, but I'm sure it was. In Canada, nobody says I shall essentially ever or uses the shall ever, so we're not taught that. In other words, there may be English speakers who are taught that particular rule still. I don't know, but not here because nobody uses it. I think if it

**Mark:** ever is used, shall is just use across the board as a more emphatic form. And it's no longer this, you know, first person uses shall and second and third uses will, and then flip them for the emphatic.

Now I think shallow is just always emphatic and will is always the

**Aven:** normal. Yeah. And no one's ever taught that. Like, no, at no point in my schooling did anyone say here's when you use will and here's when you shall, they taught me will. If they taught me anything, which they didn't, because we all came into.

kindergarten knowing how to make the future tense. And

**Mark:** they probably never mentioned the go

**Aven:** future. So no, exactly. None of this was ever discussed, but yeah, it would be interesting to know [00:54:00] more and you know, does how formally that distinction is taught depend on what language you're coming from.

Right. If you're coming from a language, which only has one future form, do you just get taught? Here are the five ways, you know, like once you're teaching Latin, there's only one future form other than the future perfect. But there's only one future. And so you teach students, you can translate this future form as any of these futures in English, right?

Yeah. And, here it can be any of these, just like the present tense, as you say, amo can be, I love, I am loving, I do love. Yeah, those are all possible translations. Whereas if Latin had multiple presents, then we'd probably tell them which one matched with which,

**Mark:** although I guess the other question is what do you do when you're teaching someone whose native language is a tenseless language? Like say, you know, Chinese, Mandarin, how do you decide what rules are you given to decide. You know,

**Aven:** complicated. Well, and this is why teaching ESL is a very different thing than just teaching English, just [00:55:00] because I know a bunch about English grammar doesn't mean I'm under any illusions that I could teach ESL Okay. So that's my rant over. Okay. Keep going on the grammar.

**Mark:** All right. So, as I said, that was a kind of funny thing that, Latin started with one word split to two words, and then came back to one word. The even funnier thing to add to that though, is that the original Latin future, amabo, was itself originally two components.

So it just keeps going back and forth. So it was originally created by having a form of the verb to be, which comes from the Proto Indo European root \*bheuə- to be, exist, and then that got glued on to the present tense verb Right. So that's the bo bis bit, the "b" is the B, it's related, to the English word"be", it's from that root \*bheuə- so that's what that little, whole 'b' thing is. Yeah.

**Aven:** Yeah. To love I be, to love I am, basically I am to [00:56:00] love, which of course is a way you could talk about the future in English. I am to love tomorrow. I am to shop tomorrow. We don't say it much, but it is, but it is like, it is meaningful. If somebody said I am to write a test tomorrow, and I'm really scared about it, you would have no problem understanding.

**Mark:** And of course the word future itself, that comes from Latin, a form of the Latin verb to be, futurus, which is the future participle. and that comes from a suffixed form of that Proto Indo European root. So \*bhu-tu-. So that's why the tea is futurus.

And that, that be sound at the beginning in Proto Indo European. It's an aspirated B. And so it becomes an F very easily, it becomes an F very easily. Now, Latin had another set of futures and it's, it's sort of, it seems sort of random, which one in a way, why does one go one way?

And the other goes all the way, but there it is.

**Aven:** Let me be clear about this. Cause if you don't do Latin, this is not clear.[00:57:00] It's not that the same verbs have two ways of forming the future, you do either

**Mark:** one or the other, but

**Aven:** depending on what conjugation and what that means is different, verbs have different vowels in them essentially have different vowels in their endings.

And depending what vowel pattern they have, they conjugate differently in certain tenses in all the tenses basically.

**Mark:** Well, so here's the way it works is the first and second conjugation verbs have those B endings.

So amabo, I will love and amabit, she will love and so forth. And docebo

**Aven:** Bo. Yeah, and docebit. That's the second configuration with the E in it. Yeah.

**Mark:** And then third and fourth conjugation verbs have endings, like Audiam. I shall hear, and Audiet. she will hear

**Aven:** where they change the vowel before their final consonant.

**Mark:** So you don't have this extra little consonant in there as a clear marker. [00:58:00] Instead, it's just a

**Aven:** vowel change. Which is very irritating when you're learning Latin, just for the record, the bo bis bit is much, much clearer, so

**Mark:** easy to spot You can't confuse it for anything else. And well, that's kind of the point because those third and fourth conjugation future forms look suspiciously, like the subjunctive mood.

Yeah.

**Aven:** Except that they're the other way around. So they're annoying. The future and the subjunctive are one of these sources of pain for people learning Latin. I'm just going to say,

**Mark:** so for the, the fourth conjugation audio, you would have Audiam I shall hear, I will hear or Audiet, she will hear, but the subjunctive forms would be Audiam.

Exactly the same, but it would mean 'were I to hear', or 'I may hear', whatever, how, however subjunctive is impossible to translate, it does a bunch of different things. And Audiat, so it's not Audiet, but it's very [00:59:00] similar Audiat,

**Aven:** and the normal present for those ones would be audit. Yes. Just the eye with no other vowel. These details are not very important, but the important thing is that the subjunctive and the future look very similar in the third and fourth, they are flipped vowels

**Mark:** and that's no accident. So that's the point is that those futures come from the subjunctive. Okay. And that's why they look similar.

**Aven:** Just makes me sad and mad. Well, and

**Mark:** so again, this shows the fact that the future occupies the intersection between tense and modality, which is kind of the point about will and shall, right?

**Aven:** The point of your dissertation.

**Mark:** Yeah. I mean, in a sense that's what the subjunctive does, right. It talks about hypothetical things and what is the future it's

**Aven:** hypothetical.

Yeah. It's just that the subjunctive can also talk about the past hypotheticals, but in a different form, not the present.

**Mark:** Well, and you could say the same thing about the past tense modal, so I would, or should write is the past tense of will and shall, would and [01:00:00] should, and they also can be in past tense hypothetical, right?

Yeah. Yeah. It would have happened if, but it didn't actually happen that way. And so, yeah, that's, that's, an important overlap there those English modal verbs will and shall, as I say, they can have past tense forms. Those auxiliaries should and would and they can indicate hypotheticals in the past, but they can also indicate future in the past.

So for instance, in a sentence like "he knew he would win the race" that's not hypothetical.

**Aven:** It was future in the past, it was future in the past. At a certain point in the past he had this future. Yeah, he was talking about the future

**Mark:** and it's also frequently used in sort of biographical writings.

Like you would say he would later go on to become president of the United States. He wasn't yet. Yeah. But he, it would happen, future to that point in the past. Yes.

So as we saw French has a future tense [01:01:00] form with the auxiliary aller, to go and English can of course do this too, the so-called go future. I'm going to love which is often reduced down to I'm gonna love which is probably in my dialect likely I don't think I would ever say going to. So clearly I would always say, I'm gonna love.

**Aven:** I think I might say I'm going to the store, but that's different. That's different. So that's why, yeah. That's why you see the difference. Yeah. Yeah. So we do when it's not a auxiliary, but a main verbal

**Mark:** yeah. When it's a main verb, then yes. You're going to say it more distinctly. But when it's being the future auxiliary, you're not likely to pronounce at least in the version of English, the variety of English that I speak.

**Aven:** This is why for the record English, and other grammars, are hard, you like, I mean all figuring out the precise of what is actually going on, just because you can speak a language doesn't mean you understand what you're

**Mark:** saying? [01:02:00] That's the challenge of it. And, and which is why it always slightly irks me that a lot of linguists will ostensibly be looking at examples from other languages outside of English. And they will just sort of take for granted the comparison to English. On the basis of their own native speaker status of English. And I always say, well, do you actually understand what the English is doing, and maybe you should, sort of go back to square one and look at how English is developing first.

So we actually know what English is

**Aven:** doing, just because you speak English does not mean you understand English grammar. And that goes for linguists too. Yeah, it's what you're

**Mark:** saying. Yeah. You've got to have data, if you're, if you're making a claim about how English works, you've got to have some support for that.

And you just have to thought about it too. Well, thought about it too, but you're only one person. If it's just coming from you, that's not data. Right.

**Aven:** Just your idiolect.

**Mark:** Yeah. So you need to go and look at evidence to demonstrate how English is actually [01:03:00] used. Right. So yeah, so I'm going to love, I'm gonna love.

And that gets reduced down to I'ma as in I'ma let you finish. So in some dialects, it gets even more reduced. And this go construction first appears in middle English and comes about through the idea of going somewhere for the purpose of doing an action. So the, earlier examples are like I'm going in order to hunt.

Right. And therefore I'm going

**Aven:** to hunt. Yeah. The so as is perhaps more common in some,

**Mark:** so this construction originally implied purpose, and similar to that are constructions like, he is to leave tomorrow, which uses the verb to be plus the infinitive to indicate a planned action,

**Aven:** or I think of the be one now as being a required action? He is to write a test tomorrow.

In other words, he has to write it tomorrow. So it was a, an, almost a necessity or a, [01:04:00] there is a modality there, an obligation. He has to be married on Tuesday. He certainly can't leave the country yet. You know, that sort of thing. Yeah.

**Mark:** In old English I think that use of the inflicted infinitive always demonstrates that idea of purpose or necessity or something it's never used as a simple future.

Right. So that's sort of a later post Old English. I don't know exactly when, but probably middle English, right. Where that happens. And so speaking of the verb to be in old English, there are actually two forms of the verb to be one of which kind of disappears from the language by, modern English.

But so in the present tense, and this is only in the present tense. So the first thing I suppose to explain is that the verb to be is in English and in many other languages around the world is super weird. Yes. Well, that's a technical term. The technical term is suppletive.

**Aven:** The real term is super weird.

**Mark:** So it's a melange of what were originally separate verbs

**Aven:** and separate roots, [01:05:00] separate roots,

**Mark:** That, for whatever reason, some of them disappeared and they just all got thrown together. And so the forums look bizarrely unrelated because they are kind of unrelated.

There were synonyms and now they're

**Aven:** used for, so in Latin you have the S root which forms parts of the present, like es and est and estis, and then you have the su-, the su- ones, which form part of the present sum, sunt. And then you have the fu-

**Mark:** actually the S ones are, come from the same root,

**Aven:** but they've come through a different

**Mark:** route.

So it's, it's just development of the

**Aven:** same. Yeah. But they, are still, they still end up being these different forms in that. And then you have the fu- root , futurus,

**Mark:** the fu comes from the

**Aven:** be root, which you talking about. So that's what you have for future, but you also have that for the perfect.

So fui, fuisti. Yeah. So the future well, only the future principle, because in fact, the future is the er [01:06:00] where, eris erit, which comes from the es- root, it comes from the es-. So you have these different, every tense looks like it's different. Yeah. Even though some of them are the same, but some of them are definitely different.

Yeah. And then in English you have, you've

**Mark:** got the be ones and then you've got, what are the es- ones, the same as the es- ones in, Latin. So in Old English you would have, eom, I am, so eom becomes am. That's not hard to see, eart becomes you are or art, right. Thou art and is, is exactly the same. It hasn't changed.

So, you know, she is, and then there is equally for the present tense and, in many cases completely interchangeable there are the be root ones. So there's beo, I am, bist, you are, bið, she is.

So in most contexts, the S forms and the B forums are entirely interchangeable without any difference in meaning.

But when the verb, so they're, in some contexts, they do make a distinction. And one of those contexts is when the verb is [01:07:00] referring to the future. So in old English, the beo bist, bið forms are almost always used for the future. Whereas the eom, eart, is forms are almost never used for the future.

Right. And that is statistically, really strong. Yeah. You can use the beo bist, bið forms for the present, but it's not the other way around. Right. So it's for the future, that's the sort of marked form. And you can only use one of them. I think in, my dissertation, I found only one example of the S forms being used for the future.

Right. It's like really uncommon.

So this can therefore be used as a way of distinguishing the future tense from the present tense. Right. So the future of the verb to be can also sometimes be supplied by a different verb entirely weorðan which means to become and so therefore you can have, he was, [01:08:00] is, and will be in, which is something that comes up in Christian writing, particularly in King Alfred's Boethius this idea of, eternal you know, a sort of non temporal existence that can be rendered as he wæs, is, and bið using the be form to indicate the future.

Or you can say, he wæs, is, and weorð, he was, is, and becomes, or really will be. And this futural usage of that separate verb weorðan might also remind one for those of you who know German it is the standard German auxiliary used to form the future tense. If you want to make an explicit future tense, like English, German can also use the

**Aven:** present. You can just say I'm walking

**Mark:** tomorrow. Yeah. But if you want to have an explicit future tense, you would use werden with the infinitive of the main verb. And so you might say something like ich werde haben, [01:09:00] I will have. One other specialized use of these beo bist, bið forms is to indicate a gnomic statement.

**Aven:** Right. I love gnomic statements and not just because they remind me of little gnome hats, but also because they're cool.

**Mark:** so a gnomic statement is a statement of general truth without actual indication of time, it's sort of a tenseless

**Aven:** it's true. It was true in the past. It will be true in the future.

It's always true.

It's a

**Mark:** statement of general

**Aven:** truth. Yeah. the sun is bright. Yeah. I mean, that's not a very good number. Yeah. The sky is blue.

**Mark:** So in old English, you would say that as seo lyft bið hæwenu, the the sky is blue.

And interestingly, another way of making a gnomic statement in old English is with the auxiliary \*sculan “shall”. So that's another interesting overlap between these two things. So as in cyning sceal rice healdan “a king shall rule a kingdom”, right?

**Aven:** And this is one of these things where when you look at translations, you know, there become [01:10:00] conventional translations, understandable ones.

When you read those old English texts, there's the wisdom texts, right, where they list off a whole bunch of sort of truths about the world. Yeah. You know, things like a dog follows a scent well or something, but the translation doesn't say that it says a dog shall follow the scent well, because they're translating and, you know, because English can translate it that way. Why wouldn't you translate it that way? But it can be very weird to read that when you. don't, know what they're doing or what that form is, because if you're a normal, modern English speaker to read a whole bunch of lists of things that say things like the king shall rule in the hall, the queen shall give rings, generously, the dog shall hunt well, the whale shall swim in the sea sounds like a bunch of predictions in my head. Right. Because I don't know that form. And I understand what you're saying, what you're saying is that's how that gnomic form is formed in old English. So of course the translator looking on that and going like, \*sculan, that's [01:11:00] shall in English, we have this verb.

Why would I not translate it with this verb? It would be silly not to, but if you don't know that it's not like that because that's not how we do gnomic statements now.

**Mark:** And I wonder if that is, I don't know, but I wonder if that's a recent change in English that that's no longer as common.

**Aven:** So it was more understandable in the past.

I mean, maybe. Because I'm, whenever I talk about these translations, what I'm really mean is that summer when I was bored and read, all of Mark's school texts, right? So I'm reading like penguin translations. Right? So there may be different ways of translating that now. I don't know.

**Mark:** Yeah. I dunno.

I'd have to look it up more recent translation or, I mean, look at other wisdom, more recent wisdom type literature, you know, how do people do it? How do people do that sort of thing now? '

**Aven:** cause, I mean, if it were me making that up now, I would say a king rules well in his house, right? These things are true about the world king rules in his hall. A queen gives out generously. A gnomic statement is done with a [01:12:00] simple present. I think,

**Mark:** I guess that makes sense. Since we don't use simple presents very much for actual normal, normal present, you, you would always use, you know, I am, I am walking.

You wouldn't say, well,

**Aven:** I walk you use that to,

**Mark:** What are you doing?

**Aven:** I walk.

No, you would never say you, but I would say, oh, I walk every day or you know, how do you exercise? Oh, I walk

**Mark:** which again, is tenseless

**Aven:** the point is, this is a continuing state of being like I knit that doesn't mean I am knitting right now.

Right? This is a, this is a feature of my identity is that I knit.

**Mark:** So maybe it's a, you know, a result of the development of resolved tenses, because you wouldn't do that in old English, you would never use am plus a present participle in

**Aven:** our standard present. Yeah, that's weird.

**Mark:** You would just use a simple present.

Right?

**Aven:** So now that we don't, we have the simple present as leftover. Therefore we can use that as a gnomic [01:13:00] present, as a gnomic statement and therefore we don't need the shall.

 Anyway. Sorry, I keep, distracting you, but it's because I find this all very interesting. I think all of us love thinking about the language we use. Yeah. it's funny to discover things that you do without thinking about them.

**Mark:** Well, in case you were wondering the word gnomic, it comes through Greek.

It

**Aven:** is spelled G N O M I C, by the way. That's why I was talking about hats.

**Mark:** So it comes through Greek gnomikos, I don't know how you would pronounce that in Greek ynomikos, probably right?

**Aven:** I just wouldn't.

**Mark:** Oh, okay.

**Aven:** Like I'm a Latinist, okay.

**Mark:** Anyways, it comes from the proto Indo-European root \*gno- hich means to know, no, yes. Hence the spelling of English 'know'.

Which is an indication that the English word know was pronounced with that initial K and gives us not only the word know. But also the word no mic only those two, but [01:14:00] also the word gnomon or nomon,

**Aven:** which is the pointer on a sundial? Yes.

**Mark:** Good, good knowledge of obscure words words. That's

**Aven:** a crossword word right there.

**Mark:** And the sundial will lead us to the history of clocks and timekeeping. But before I get into that, do you have any

**Aven:** questions? Well, I feel like we've talked a lot about grammar. So I don't want to go too far. Have you talked about all the possible ways to say the future in modern English now?

Have we covered those all? So the, oh probably not. Yeah. I mean, we touched on, so the one you talked about is the go future. And then of course the will and the shall, you talked about in the video, I'm about to, about to, and that's not just an occasional, that's a very common future. I'm about to do something

**Mark:** and then the infinitive one that I am to do I am to do.

**Aven:** Yeah. And then the other thing, I mean, I think you mentioned this in the video, but I do think it's worth [01:15:00] stressing that actually English just uses the present for future most of the time. Yes. And I think it's like really worth being very clear about that. Yeah. So in

**Mark:** old English, it's like 90,-some odd 95% of the time, future time references are rendered with the present tense.

**Aven:** Right. And the reason, you know, it's the future is either context or adverbs. Yeah. And we do that all the time in England, modern English and modern English. This is

**Mark:** it's completely normal. I mean, I'm sure that percentage has come down.

**Aven:** Yeah. Because we do say I'm going, I will certainly say, but if you think about it, how often in your daily speech do you say I will do this?

Most of the time you say I'm going to the store tomorrow, I'm walking the dog at nine in the morning, so I need to be up early. Yeah.

**Mark:** I'm going on vacation in June,

**Aven:** I'm leaving for the coast tomorrow. You know, Yeah. Whatever, like you just, that is normally [01:16:00] how you say it.

It doesn't, it's not that the others feel weird, but if I said to you what are you doing tomorrow? And you said, I will be teaching a class. That would be odd if I said, what are you doing tomorrow?

**Mark:** Oh, I'm teaching class. Yeah.

**Aven:** I'm teaching class in the afternoon. And I have to make sure that I do to dah, dah, dah, dah.

Yeah. It would be, it would really be marking something like, so you might say, oh, I will be going to the store in the morning. So I have to make sure that I need to do that.

Like that would be, it's emphatic, yeah. Or if I said, will you be going to the store tomorrow?

**Mark:** I

**Aven:** will. Yeah. Yeah, yeah. You know, so there, there are places where we say it. It's not like it's weird, but it's the marked use. And so I just want to sort of really, I don't think we necessarily recognize that, that in our own speech, because we think.

That we use the future tense. Cause we know it, we hear it. We recognize it. Totally understand it. But I think if you pay attention to how you speak, you will realize you don't use it that much.

**Mark:** And as I said, in, in many types of subordinate [01:17:00] clauses, you can't use the future. It's bizarre, you know, it would not be normal English to, to use a future tense, even though it is referring to a future.

Yeah.

**Aven:** Can you think of one right now? Just to give an example of that?

**Mark:** W what was the one I used in the video?

**Aven:** Oh, if it will rain tomorrow. Yeah. If it rains tomorrow, I will definitely, but

**Mark:** I mean, that's, so I drive, if it, if it rains tomorrow, right. You would never say I'll definitely drive if it will rain tomorrow. Yeah. That's

**Aven:** bizarre. Now I think of those as being conditional. So I don't think of them as being full futures, but that's a Latin, yeah, that's a Latin tick, you know, that has to do with my

**Mark:** it is conditional, but you can't -- in Latin, you

**Aven:** could. And we, therefore, I do it when, when translating Latin phrases, we do it. So it seems less weird to me than it should because when you translate certain, you know, you do that to make it really clear what's happening when the Latin, so you translate it in this very formal way in English.

That is real weird. Yeah. Yeah.

**Mark:** Exactly. No one would say that.

**Aven:** Okay, so that was one thing I just wanted [01:18:00] to ask and we've kind of talked about the distinctions, but also about how hard it is to say why we use one in place of another, why we would say I am going to, instead of I will. So maybe I won't actually ask you to try to distinguish those because I think it's actually really hard.

**Mark:** Well, and it's, it's beyond the scope of what I originally studied. Right. My intention all along was, well originally my intention was I'm going to do both old and middle English, and then I realized that stupid, crazy. It was way too much. So I just limited to old English and already that was tough. But I always intended to then, I'm going to take this forward through the early modern English and modern English and wow.

It's, it's enormously complicated. Yeah.

**Aven:** So I won't ask you to tell me that. What I will ask you about though, you kind of touch a little tiny bit on this, but basically what was the, what do we think was the tense situation in proto Indo European?

**Mark:** Proto Indo European didn't have tenses. It had aspects.

So it only had aspects. Yeah. So tenses were a later [01:19:00] development, as far as I know, in terms of the current thought about.

**Aven:** So can you give a little bit of an explanation what you mean by aspects? So

**Mark:** aspect has to do with The relative time, rather than the absolute time. So if something is ongoing with another event or is completed before another event so perfective,

**Aven:** yeah.

See to me, that's when you describe it, that way that's tense. If it's completed before another event, I mean, that's just relative tense as opposed to absolute tense. I'm familiar with aspect in Greek where it overlaps with tense. And there's a little bit of it in Latin and in English and in French.

Right. So I just feel like it's one of these things it's hard to talk about, but we see it mostly in continuing versus perfect is the most common. So we were talking about, I walk versus I am walking. that's aspect, right? Those are both present. Yeah.

[01:20:00] Theoretically though, maybe not. But anyway, the aspect is what's different. I am walking is a continuous action, which says that there's an ongoing action. I walk is a statement that might be tenseless, but could also be I walk to the store and that's a completed action, even though it's in the present.

It's a bounded action. It has a beginning and an end, whereas I am walking does not have a beginning or an end. Yeah. In the past tense you have, I was walking versus I walked, or I have walked.

Those are three different aspects. All of them in the past tense in our thinking, but I was walking again. No marker of beginning. No marker of ending. I know, you know, all of this, I'm just, I think it's helpful to, I walked no marker of beginning or ending, but also no marker of continuance.

I have walked definitely says this has been completed. It doesn't necessarily tell you how when it started, but you know, that it began and ended. So you're saying that in proto Indo European, there were markers [01:21:00] of whether it was continuing or

**Mark:** well, this is why when you use an imperfection live aspect, you're expecting there to be another verb, right?

Like you never use it on its own or you would rarely use it on its own. I was walking to the store ... when? Yeah. When something happened, what happened? Right. So it's always implying there's a reference point, right?

**Aven:** Yes. To some extent that's the other use of the imperfect is the habitual, habitual, which doesn't necessarily require that, I used to walk to school,

**Mark:** but so this is the thing, like imperfective you can have an imperfective in the past and the present and the future. It can, in terms of absolute time, you can put it anywhere.

which is why there are many verbal systems that have, you know, combination of aspect and tense. So you can have both the tense category and each tense has multiple aspects.

**Aven:** So, which we might just say as different ways of saying the present, for [01:22:00] instance, or different ways of saying the future, but when you drill down, so only aspect no tense is the way that it's currently theorized. That's

**Mark:** my understanding now of course, the problem with doing any kind of reconstruction of Indo-European is there's no direct evidence, right? So you're basing this on what are the tense and aspect systems of all the languages that comes with proto Indo European,

**Aven:** that was my, that was what my question was going to be.

My followup question was going to be is in Indo-European languages. What are the common ways of handling the future? Cause you've talked about the germanic one doesn't have a future historically, and then develops ways of dealing with the future. But the Latinate and Latin and Greek being my other ones, I know as sort of older Indo-European languages, both have developed futures.

Yeah. So what else do we have like as, as family groupings?

**Mark:** So this is a particular hallmark of all the germanic languages is that [01:23:00] the verbal system is massively simplified, right? To just two forms, present, and non present. Right. And so I don't want to say,

**Aven:** I know you don't know all the other,

**Mark:** most other Indo-European languages have more complex systems of tense and aspect.

 Germanic is the odd one out for what happened to the verb system. So it got simplified to this bipartite system of past and non past.

 well basically it, it developed two kinds of past tense, two ways of doing it. So there was what are called the strong verbs, which formed their past tense from having the vowel of the stem change.

**Aven:** but again, this is like what we're talking about with the future in Latin, right?

Some verbs go one way, some verbs go the other way

**Mark:** so they're not completely separate categories over, and they're

**Aven:** not two different meanings because no one verb can have both. Yeah. So strong verbs change the vowel, the weak verbs add an ending. So

**Mark:** the weak [01:24:00] add that what's called the dental suffix ed in, in modern English, right.

Where you add ed to

**Aven:** make the past, so this is the sink sink sunk versus walk walked. Yeah. And

**Mark:** so that's, part of this massive change that happened to Germanic, all the Germanic language of that whole branch of Germanic languages is that they, lost all that complexity

**Aven:** and then took this particular route.

**Mark:** And then they just have these two ways of doing the non present. they either went for the, they either kept the old fashioned ablaut which is the change series, the change of the, the vowel of the stem, or they went the other way. And you just add this dental suffix.

**Aven:** Okay.

The last question I have before we go into our third hour talking about this, and you talk about timekeeping very briefly. Your dissertation was on the ways that Latin, what, one of the things your dissertation was talking about was the ways that Latin may have influenced the development of English future tense, right?

In terms of sort of the movement away from this modal

**Mark:** or at [01:25:00] least how old English speakers

handled.

**Aven:** Yeah, I know, but that's in that sense, that means that, and whether it's Latin or Christian or whatever, that means that it's Latin is influencing old English. Not because content, I mean, I, it's very specific vector and that's kinda my point.

How did that get into spoken in English? Is kinda my question, right? Because you're talking in these things about what are obviously influential issues, right? Like translations of the Bible translations of early church fathers that get used in sermons. These are things that become disseminated and Alfred's texts become disseminated, but still realistically that's a small portion of the population who ever read a single piece of written old English, much less a translation of a Latin piece. And the knowledge of Latin itself would have been confined to an even smaller amount of people in terms of people who could have sort of even had this kind of understanding of how the two languages lined up or didn't.

And yet [01:26:00] English has a whole changed. Do you have any thoughts about the mechanisms there? I mean, obviously it happened, you don't have to prove to me it happened. But in terms of that mechanism for that transformation, and I know that's not what your dissertation was not arguing that like Alfred translating Boethius is what made English develop a will future.

Right. I know that's not the causal relationship you were talking about, but it's kind of a piece of it. Do you have any thoughts about how that works?

**Mark:** Yeah, so, I mean, this goes back to my initial ambitious plan of including

**Aven:** all of the English. So,

**Mark:** middle English is sort of the wild west of verbal constructions.

It's it's just crazy, everything goes

**Aven:** until suddenly nothing does.

**Mark:** And, and there's, I mean, partly it's what, evidence survives from what periods, you know, we have a relatively limited Corpus of old English material. We have much more from middle English, especially late middle English, but

**Aven:** again, there's a geographic specific,

**Mark:** but it's, but we [01:27:00] have a much better idea of dialects in middle English.

I mean, most of what survives in old English is west Saxon, you know, one dialect. there's bits and pieces of other stuff. And obviously there were people speaking various, we don't know what they were saying. And there was a huge influence in the later old English period geographically in terms of the north and the south.

So in the north, they were obviously more influenced by old Norse and though we don't really see this in old English. It becomes apparent in middle English. So clearly they were already doing it in old English, but it just doesn't get written down. They were borrowing the Norse auxiliary that was used for constructing the future.

So muna, basically it means it's the mind word. Oh, okay. So I intend to, I have in mind to do something. And so if you look at Northern texts in middle English, you'll see this use of muna in some dialects and I've, only looked at this sort of briefly but it's really stark the differences in different dialects.

So in [01:28:00] some dialects, you'll see \*sculan, shall, being used exclusively, right. For all the future tense constructions and will doesn't even come into the picture really? So it's like, yeah, this is a huge variation in middle English. And so, I mean, there's gotta be a complicated pattern for how this eventually comes into, you know, by the time you get early modern and which I haven't worked out because, you know,

**Aven:** and maybe untraceable,

**Mark:** maybe largely untraceable though, you could probably, if one were to spend the time carefully going through all the evidence and figuring out the dialects and working all that out, you could probably work out how does this filter through to early modern English. The answer is, I don't know, because I haven't done that work, but I think it's really interesting and you know, I'm not going to do it. No, no,

**Aven:** I, it's just interesting to think about how what's going on at like it's one thing to see, say how a literary trope moves from highly literate niche [01:29:00] thing out into the wider world, because a literary trope sort of sits there and then can be used and then picked up and then disseminated.

But when you're talking about something as fundamental as grammar, it seems very unlikely that like one person decided to translate the Latin X way and then suddenly all of England does that.

**Mark:** And, probably in old English, there was some kind of literary tradition of this, but by the time you get to middle English, it's all very local and parochial. And because there isn't sort of a standard English, right. So everyone's just sort of doing it their own way, the way they speak.

Right. And so that's why you get such stark differences between different, not only different dialects, but like different writers, like individual will have his own way of doing it or whatever. So yeah, that's a whole big complicated

**Aven:** thing. Okay. I'm just curious. I didn't expect you to answer that necessarily. I just thought it was an interesting point to raise.

**Mark:** So if someone out there has time on their hands, you [01:30:00] can write the sequel to my dissertation and go through the massive evidence of middle English and figure this out. It would be interesting. I would like to read it, but I don't think I want to do it now.

**Aven:** Yeah, I get that. Okay. Tell us about timekeeping.

 And now this is very good on an audio medium. I'm looking at my watch.

**Mark:** So we had the Gnomon. Sundials. Well as I said in that insert while king Alfred translated Augustine's Soliloquies, he never translated the Confessions. Where h talks about time where he talks much more explicitly about time, which is a shame because obviously that would have given us more insight into how old English speakers might've thought about Augustine's breakdown of this tri-part time.

But king Alfred is involved in the story in another way, coincidentally, in that he appears to be the first clear recorded instance of a European using the candle clock. Oh,

**Aven:** okay.[01:31:00]

**Mark:** So a candle clock measures time by burning a candle with time measurements marked in it. You mark your hours and it burns down, you know how much time has passed. Now he's not the first ever in the world to use this.

The Chinese were known to use the candle clock in the sixth century, predating King Alfred. But these two uses are likely independent inventions. At that time, it's not a matter of diffusion. Yeah. Yeah, absolutely the Chinese invented everything and that influence directly influenced a lot of European stuff. Not in this case, probably.

There's not a lot of contact at this time, so probably, yeah, it probably is independent. The advantages of the Kendall clocker that it doesn't rely on the sun as in the sundial. So, you know, you can use it when it's cloudy.

**Aven:** It doesn't freeze like a water clock. You,

**Mark:** you just anticipated one of the things I was about to say , but,

**Aven:** but it's, you know, as a Canadian, I know the problems of a water clock,

**Mark:** But sundial had been used, ever since around [01:32:00] 1500 BC by the Egyptians and Babylonians.

And well, leaving aside the freezing bit, it's simpler and requires less maintenance than the water

**Aven:** clock, the water clock is a pain. I mean, a bunch of different ways. And it evaporates when it's hot and

**Mark:** which by the way, works by using like a slow drip of water to measure time.

I mean, think of a, an hourglass, but using water, I guess it's a certain

**Aven:** amount of water is gone and that tells you yeah.

**Mark:** Now again the Babylonians and Egyptians seem to be the first to use water clocks as far back as the 16th century BCE. But it was also used in the ancient world in China, India, Persia, Greece, Rome.

So everyone is doing this. The Greeks called the water clock a clepsydra, which means literally water thief. So in many ways though, I guess we've got the Babylonians to thank for kicking off the whole timekeeping endeavor because they seem to be the earliest. [01:33:00] And another element that we have to thank the Babylonians for is the division of the day into 12 daylight hours, probably to reflect the 12 part Zodiac.

So, you know, there's a nice,

**Aven:** and was it as spiritually significant? I think a religiously significant number,

**Mark:** but also because the Babylonians use the sexigesimal counting system. So base 60 instead of base 10, hence also 60 minutes, 60 seconds. And so mathematically that works nicely with 12 because of the 12 can be divided into fours and threes.

**Aven:** 60 can be divided into fives and fours and threes.

**Mark:** And yeah. So all the mathematical reasons why this just works out neatly But the real obsession with time began in the Christian monasteries of Europe. And it's all because of their praying schedule that they were so interested in this. So in order to hold [01:34:00] the necessary services at the appointed times, Matins at sunrise, Sext at midday, Nones at mid-afternoon, Vespers at the end of the workday and Compline in the evening.

They therefore needed to keep track of time and a pretty, specific, detailed way. But there were some problems. So sundials, as I said, wouldn't work at night,

**Aven:** which is the time when you really need to know what time it is. Cause you're asleep. You need to be woken up or

**Mark:** on cloudy days. And

**Aven:** England, it's always

**Mark:** cloudy.

That's a good point. And the water clocks is, as you mentioned would tend to freeze in the Northern monasteries in the colder months and candles were expensive.

**Aven:** Yeah. Yeah.

**Mark:** And so often what they would just do is like appoint one of the monks with the job of tracking sort of natural cues like, the cock crowing in the morning.

But the problem with that is that that one guy in charge had to stay awake all night leading to what is now a children's song. Frere Jacques. [01:35:00] Feel

**Aven:** like?

Frere Jacques, Frere Jacques, dormez vous? Dormez vous? Sonnez les matines, sonnez les matines, Ding, dang, dong, ding dang dong. And for those who

**Mark:** don't know French: brother, John, wake up, sound the matins!

**Aven:** Are you sleeping? Are you sleeping? Brother John? Brother John? Morning bells are ringing. Morning bells are ringing ding dang dong. Which is not quite the same, but yeah.

**Mark:** So the church were obviously, invested in developing better clock technology for keeping time.

Now let's pause for a moment and consider this word clock. Where does it come from? It's related to French cloche, meaning bell, from Latin which may have come originally from a Celtic word, it's uncertain, but that may be the case. Okay. So originally. A clock was just that a bell. And so in the monasteries, when it was the appointed time for a prayer, someone would ring a [01:36:00] bell to call the monks to service.

So brother John, right. You just noticed that, oh

**Aven:** God, that was time, hand bell or the bell in the tower or whatever. Yeah. Yeah.

**Mark:** And it was only later when the bell was attached to some kind of mechanical timekeeping device, that the word clock transferred from the bell to the timekeeping device.

Now we don't know who invented the mechanical clock, but they start to appear in medieval Europe in the 14th century. Now, initially these clocks often, you know, contained, as we say in clock towers didn't have clock faces. They just rang the bell. So the mechanical device would run and ring the bell.

There was nothing to look at.

**Aven:** They would just be a bell, not necessarily six bells for six o'clock it would just be a bell an hour. Yeah. Yeah.

**Mark:** The dial when it was eventually added to clock towers was developed from the old sundials. And so the reason why it

**Aven:** has the [01:37:00] same number of

**Mark:** hours, that's why it has the same number of hours.

And that's the reason that we have clockwise and counterclockwise because the circular motion of the clockwise direction follows the, the movement of the shadow on the sundial in the Northern hemisphere, the opposite way in the Southern hemisphere. But this was invented in the Northern hemisphere.

So that's, that's the way it goes. So that's why we have the clock face, you know, the way we do it's, it's just,

**Aven:** you know, it's a vertical yeah. sundial., sundial

**Mark:** the word dial by the way, comes from Latin dialis, meaning daily from dies day. So dial is specifically the day from that. Yeah. Now these early mechanical clock dials had only one hand to indicate the hours because the clocks just weren't accurate enough for measuring anything smaller and people didn't need it, They didn't need it. Yep.

Because as I say, this is the point of, this was for the marking the prayer hours. So [01:38:00] but over time as there were technological improvements to these early gravity driven clocks, improvements like Christian Huygens' or Huygens, to give the correct to

**Aven:** attempt to attempt the

**Mark:** correct pronunciation of the Dutch name, his invention of the pendulum driven clock, rather than the straight gravity, you know?

So a weight, pulling down to turn the thing, but the pendulum swinging, which is more accurate. So his, innovation also the innovation of Robert Hookes' improvement to spring driven clocks. It's another way to do it. And Daniel Quare's addition of the concentric minute hand. And so with all of those developments clocks became more accurate and additional division became possible. So the word minute is related to the word minute. Spelled the same pronounced differently in English, but they are they come from the same root. So [01:39:00] they come from Latin minutus, meaning small.

And that word was used in the Latin phrase, pars minuta prima, the first small part or in other words, the first division of the hour into 60 smaller parts. And then second in turn comes from the phrase, pars minuta secunda, the second small part. So the second division into even smaller segments.

And so the Latin word meaning not only second, but also following comes from the verb sequi to follow. And so that leaves only the word hour to etymologise. It can be traced back to Greek in this case, Greek Hora, which rather vaguely referred to a period of time or season in Greek

**Aven:** seasons, most that's the Horai, who were goddesses are the seasons

**Mark:** and

Ultimately coming from a proto indo European root meaning year or season, which [01:40:00] through the Germanic branch also gives us the English word year. Right. Greek Hora also gives us words, such as horology, which is the science of time, French horloge, horloge.

**Aven:** We don't pronounce the H sorry. We only spell them.

Remember everything is

**Mark:** silent, French horloge, meaning clock and horoscope, literally period of time watcher,

which brings us back to the notions of prediction and the future. And what's more, the metaphor of the clock was particularly important during the enlightenment in which it was used to conceptualize

at least one idea that the universe, the clockwork universe set in motion by God, the cosmic clockmaker

**Aven:** who just set it going and let it go. Let it go. And is not therefore interfering.

**Mark:** Yeah, it was all sort of predetermined because he made all the gears.

And this was particularly influenced by the laws of [01:41:00] motion that Sir Isaac Newton discovered this very deterministic

**Aven:** causal, cause and effect are inseparable.

**Mark:** So for Newton, as long as you knew all the conditions you could, you could predict absolutely the result. This is a very deterministic universe, which was completely predictable.

And it's, I suppose, an interesting note, you know, to bring it back to, the insert, Protestants and Catholics. Well, that too, but also in terms of so Newton's physics being kind of thrown on, on its ear, by Einstein's universe. Right. which kind of shows the problem of this, very predictable clockwork universe and shows that time flows differently in different parts of the universe.

And

**Aven:** that caused and effect don't necessarily

**Mark:** function. Though Einstein was initially really upset by that idea, reluctant to accept the fact. But I think he knew that,

**Aven:** that he wasn't what was coming out of, what he was [01:42:00] saying was not going to, it was not going to be what he wanted it to be. Yeah, yeah. Yeah.

**Mark:** and we're left with the now philosophical, scientific problems of, do we live in a deterministic or or

**Aven:** chaotic universe

**Mark:** universe, you know, do we have free will who knows?

That's

**Aven:** It's all a simulation, doesn't matter.

Well, that was quite the epic journey.

**Mark:** Well, if you give me a topic like this,

**Aven:** I didn't, you did,

but no, it was all very interesting, but I'm not going to tell you how long way we've been talking. I'm just going to say, I think we should be done. I think it's time to finish now,

**Mark:** but there'll be more, as I said, so

**Aven:** stay tuned. All right. Good. Well, I'm finished my drink. You need to eat the rest of your bananas

and it's time to go. Bye-bye.

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**Mark:** Bye