

CounterClockWise

Chapter 2 – Time

Kevin is the kind of person who is either sound asleep or wide awake. There is no in-between for him. He opens his eyes and is instantly awake as he looks up at the ceiling. He turns his head to look around the room, and takes a deep breath, as he seems to accept his surroundings. Rising slowly still looking around the room he remembers all the events of the day before and a hundred years ago.

He glances at the holographic display and spots a miniature figure of Chaucer in the video screen beckoning to him.

He approaches the image, but the Chaucer figure continues to repeat the same beckoning action.

Kevin looks around for a button or a remote or some other kind of control device. He begins poking at the screen and the surrounding area trying to get something to happen. Getting frustrated he finally speaks.
“How the heck do you turn this thing on?”

And instantly Jeeves answers,
“Good morning, sir. May I be of service?”

Kevin jumps a little at the voice from everywhere and nowhere but quickly recognizes it. To be sure, he asks,
“Are you the AI that I used last night for video projection?”

To which Jeeves responds,
“Indeed I am, sir but I prefer the term CyberPerson or Cyberon – In this era, the term Artificial Intelligence is pejorative.”

Kevin utters a quickly apologetic,
“Sorry.”

And Jeeves accepts his apology,
“Quite all right, sir. Shall I activate the message icon for you?”

Happy for his help, Kevin says,
“Yes please.”

When Jeeves has activated the holo-display, the Chaucer-icon springs to life and says,

“You have probably discovered that the CyberPerson whom you met last night is available in your room as well. So if you have questions or needs, you can just interact verbally.”

Shaking his head, Kevin mumbles,
“Now you tell me...”

And continues in a louder voice to Jeeves,
“Cyberon, should I call you Jeeves like Chaucer did last night?”

And Jeeves responds,
“Jeeves is my most common name, though I will answer to any name you choose.”

Smiling, Kevin replies,
“Jeeves it is. I like that.”

Rummaging around the various closets and cabinets in the room and the medicine cabinet behind the mirror over the sink, Kevin finds everything necessary to complete his morning ablutions. He dresses in a nice long sleeve shirt and proceeds to roll up the sleeves. A pair of Khaki trousers and brown loafers complete his attire.

When he has finished dressing, Jeeves chimes in with,
“When you are ready, sir, I suggest that you visit the cafeteria and eat a late breakfast or an early lunch as it is now 10:30.

“Then I suggest that you proceed to the RDoE offices.”

And Kevin replies,
“Food always sounds good! I am starving; you know it’s been over a hundred years since I last ate”

He proceeds out his door, but even before he closes it behind him, he reverses his direction and re-enters the room and says,
“One minor problem, Jeeves.... How do I get to the cafeteria and the office?”

Jeeves chuckles out loud and says,
“Please direct your attention to the display where I will project a model of the layout of this estate. The pathways marked in red will take you to the cafeteria and the pathway marked in green will take you to the RDoE offices.”

Kevin approaches and examines the model intently but very briefly, and turns to exit once again as Jeeves expresses surprise and approval,

“Impressive, sir, impressive. Three point four seconds is not much time in which to absorb the displayed information. If you get lost along the way just speak to me and I will be there to provide additional direction.”

But Kevin has near perfect memory for an organic, and proceeds unerringly to the cafeteria.

Diana, his fellow time-traveler, is already there in the cafeteria line -- looking cute in jeans and a man's white, dress-shirt. The sleeves are un-buttoned and a bit long and the shirttails are out and tied around her trim waist. The top three buttons are unbuttoned – downright interesting.

She is going through the serving line collecting a huge amount of food for so trim a woman.

As Kevin enters, he spots her and hurries to get a tray and join the service line behind her. She notices his haste and turns to smile at him. He doesn't smile back.

He initiates a conversation somewhat warily by asking,
“Did you sleep okay?”

And she replies completely at ease and somewhat familiar,
“Dreamy – want to join me for breakfast.”

To which he replies,
“Sure, Wyoming Knott.”

To his surprise, Diana immediately recognizes the Heinlein character he is referring to and replies,
“Oh! Heinlein, huh? *The Moon Is a Harsh Mistress?*”

He turns his head slightly to one side and squints obliquely at her as he replies.
“One of my favorite authors.”

Diana changes the direction of the conversation by introducing herself,
“I'm Diana Vanderbilt, by the way.”

And Kevin responds to the introduction in kind.
“Kevin Williams.”

And Kevin looks at her obliquely once again as she says,
“Yes I know.”

Kevin shakes his head. Does EVERYBODY know who he is?

The pair load up their trays and seek out a table for two in the back corner, and proceed to eat hungrily. Diana puts ketchup on her eggs and Kevin looks at the process skeptically.

After a few mouthfuls have taken the edge off his hunger, Kevin says, "OK, Tell me something about YOU... better yet, tell me how you came to be in my truck last night."

To which Diana replies, "Well, I'll tell you a little, but I would rather let the story unfold as we get to know each other better. You know we are going to work together on this Time-Machine project?"

But Kevin persists, "Great, but that doesn't answer my question."

And Diana tries to appease him with a few small nuggets of personal information, "Okay... My family has been a prominent family in this area since Moses came over on the Mayflower. We own lots of land and lots of old houses. And I inherited my Grandmother's house when she passed away about 3 years ago."

And Kevin answers, "Sorry to hear that."

But Diana rejects the regret in his voice by saying, "It's OK. Nana was a terrific old lady but she knew it was time."

But thinking of her Nana causes Diana to slip into a dreamy reverie for a few moments while Kevin wolfs down a few more mouthfuls of breakfast. Diana recalls her grandmother sitting on the large front porch in a rocking chair. In her memory, Nana is about 70 and is dressed in a full length, sun dress ...her hair is grey and up in a bun although several strands have gained their freedom. She is a tall, handsome woman who looks very relaxed and friendly – lithe for her age. And Diana sees herself as age 10 or so. She is in the yard, swinging on the old rope swing that hangs from a lower branch of the enormous live-oak tree that dominates the yard. Shaking her head as if to awake from the reverie, Diana says, "Anyway that was her house whose driveway you tried to turn into when you landed us in the ditch."

And Kevin slips in another question, "And you were sleeping at that time, right?"

And Diana reveals that she might not have been... "Not quite...just resting."

A little surprised at this revelation, Kevin changes direction by asking,
“So why MY truck?”

And Diana answers evasively,
“Well I needed a ride home, and ...I thought you might be going my way.”

Kevin is incredulous at this piece of evasiveness as he says,
“You pick MY truck out of thousand in a parking lot; climb into it naked as a jay bird because you THINK I am headed in the direction of your house. Then coincidentally, we are almost hit by some nut and that causes us to swerve and spin into YOUR driveway?”

And Diana says innocently,
“I was NOT naked, and it sounds pretty strange when you put it THAT way?”

He persists,
“How did you know WHICH way I was headed?”

And Diana’s thoughts flash back to a dark room inside the big old house. Three women in hooded cloaks are chanting something and Diana, still about age 10, is dressed in a miniature robe taking part. Coming quickly back to the “now” Diana replies evasively again,
“I didn’t really. I meant to say I HOPED you were going my way. Well, we are finished eating and I’m anxious to start building a Time-Machine.”

She starts to rise, clearly indicating that conversation is over. Recognizing the sign, Kevin rises as well and they walk out together, depositing their trays in the receptacle as they head to the lab.

As they enter the lab together, Chaucer looks up from the table where he is poring over a diagram with a tall woman who reminds Kevin of his classical piano teacher from childhood. The lab is huge. The walls are at least 25 feet high, and in the very center is the beginning of some sort of construct that is difficult to identify. Kevin is surprised that he cannot immediately infer its functionality. So he decides to accept the appearance and gather more information.

Chaucer approaches them and says,
“Hello, sleepyheads. Welcome to Sleepy Hollow.”

His attempt at humor doesn’t quite work, and Kevin and Diana look confused at his literary miss.

Chaucer looks at Diana and continues,

“First, let me give you a little catch-up -- Heinz ketchup that is -- on where we stand with Time-Travel. We now know for sure that it can be done, but we don’t know how to do it.”

To which Kevin replies,
“Huh?! You just did it! You brought us here.”

Chaucer is clearly enjoying Kevin’s confusion as he says,
“Actually we had nothing to do with that.”

Wanting much more of an explanation than that terse statement, Kevin objects,
“Wait a minute!”

And with Kevin staring at him frustrated, Chaucer says,
“Good...a minute is an excellent example of a measure of time. I have prepared a briefing for you...so if you will direct your attention to the holo-display... Jeeves, you may begin.

Barely an instant elapses before an image materializes in mid air – much as it did the night before when Kevin was addressing the collected team of researchers at CounterClockWise, Inc. And Jeeves narrates as follows:

“Authors through the ages have explored the tantalizing idea of being able to travel into the past or the future! In a sense, we are time-traveling right now. .. into the future, one instant after another! So our first question is...does time only travel in one direction at one rate?

“...Meet Alabama Slim.

“He is not only a great pool player, but he is a time-outlaw...he is the only one you will ever see perform this particular pool shot...

”If we watch Slim breaking the rack in a game of 8-ball, we can easily tell if time is running forward or backwards. The backwards sequence doesn’t break any laws of physics, but the coming together of all of the right factors to make it happen is SO improbable that we can use the words “never happen” and be absolutely right!

”In STRIKING contrast, when two protons scatter off of each other, time is totally reversible. The backwards version looks just like the forward version. So why is this so different from playing pool? The answer is that the interaction between the protons is SIMPLE...and therefore elementary particles can travel both forward AND backward in time.

"But if time can move both forward and backward, a natural question to ask is 'How do we define the PRESENT'

"Elementary particles are described by an equation called a wave-function, and when two particles interact, their wave-functions become entangled ... but for how long? When do they reestablish their individuality? A physicist would ask 'When does the wave-function collapse?'

"Here's an electron bumping into one of his brothers. Let's say we know that AFTER the interaction, The first electron will be in one of two places ... behind Door A or behind Door B ...

"It's possible that for an extended period of time ...real time ...seconds ...even minutes ...our electron can effectively be in both places at once ...

"One way to think of this is that the electron has a flow of time that depends only on its next interaction. PRESENT for the simple electron is an indefinite extension...it remains in the present until some new interaction causes it to change its wave-function. And once that happens time has moved forward.

"The collapse of the quantum wave-function is the point where the universe moves forward ...where present becomes past... and where more than one **possibility** becomes just one **actuality**.

"And Time itself generally becomes irreversible when the collapse effect spreads to enough atoms and molecules that the backwards sequence becomes so improbable as to "never happen". So we -- complex beings -- can never travel back in time one instant after another.

"So our time-travel to the past will have to be a single large step back -- while other options MAY exist for traveling into the future?"

When Jeeves pauses, Kevin immediately asks,
"What about wormholes?"

To which Diana asks further,
"What are wormholes?"

And Chaucer attempts to answer them both,
"AHH, wormholes!

"One possible solution to Einstein's General Relativity equations is called a 'wormhole.' A wormhole can provide a quick path through time as well as space. A theoretical traveler could enter a wormhole here and now and emerge anywhere in the universe... and at any time in the remote past.

But it seems that creating a wormhole would require immense amounts of energy... perhaps even an entire galaxy's output.

So in our search for a plausible time machine, wormholes, it seems, might be a literal dead end.

“Now, you two will join us in earnest in our quest to build a time machine. We will explore ideas from every branch of science that promises to aid us in our quest.

“We will begin by continuing our study of Quantum Mechanics and the physics of the small.

“And we will build on that in order to understand how complexity arises from a few basic particles.

“Then, since we want to transport humans – we will examine how DNA instructs the body to build itself – mostly from amino acids.

“We will interrogate the Standard Model of Physics to provide us with an understanding of what forces are at our disposal and how those forces work.

“Relativity – both special and general – will be our entry point into a study of dimensions.

“Finally we will try to tie all of this together in a Theory of Everything...grown out of String Theory and M-Theory.

“Along the way, we must answer questions of how intelligence arises and whether free will is a quantum mechanical manifestation.

“And in the end, we will be successful because you have shown us it is possible.

“Let's begin... go brush up on Quantum Theory.”

Kevin and Diana are eager to garner the knowledge of this future laboratory and its many resources. They spend much time in the library. Often they can be found at a large table with heavy tomes open and spread out around them. Other media options are certainly available, and they avail themselves of these options frequently. But they both quickly find they are most comfortable with books when studying topics that date to their own time.

When together, they can be seen talking and gesturing -- sometimes in very animated conversation.

Often they can be found together or singly with Chaucer -- usually in his lab. In these cases, books are rarely in sight, as Chaucer prefers the richer content offered by other media options.

Sometimes Kevin and Diana can be seen walking in the evening; sometimes they are in the library sometimes separately in their offices.

Weeks pass and Kevin and Diana slowly become friends as well as colleagues, but in unspoken agreement, they have not questioned one another on a personal level.

One morning when they are walking to the offices together for the day's work as is their habit -- Diana suddenly breaks the unspoken agreement and asks Kevin, "OK, what's YOUR family like...100 years ago."

To which Kevin replies without hesitation, "I am an only child. My Mom was a classical pianist who teaches music and my Dad is a math professor at a University. Ironically they both went to college on athletic scholarships."

Surprised a little, Diana asks, "Do YOU play the piano?"

And Kevin answers, "A little...Mom always wanted me to appreciate the fine arts and she pushed me in that direction. So I can play a little Sibelius or Dvorjak. But it was never my passion.

And while my Dad never really cared whether I followed in his footsteps or not, he had a great influence on the analytical part of my psyche.

We played chess together and had Rubik's Cube competitions, We arm wrestled and played racquetball.

He always had time for anything that was physically competitive or mentally challenging."

Diana is a little surprised at the free flow of information and presses on, "Where are you from originally?"

Kevin is still singing freely: "Born and raised right down the road. Then I was gone for almost 15 years and just got back a few years ago."

So she asks, "Where'd you go?"

He says, "Well when I graduated from high school I joined the navy to see the world. My folks were NOT happy, but it was time for me to get out on my own. After four years of duty, though, I had seen enough.

“From dives in Hong Kong to tattoo parlors in Brazil, humanity is an interesting study.

“Some of those places are MUCH more dangerous than any battlefield.

“But I managed to avoid getting my throat cut and also managed to win a big jackpot in Monaco. So when I returned stateside, I used the money to go to the University of Chicago for my undergrad work and since I had a perfect score on the math part of the college boards and some pretty good grades, MIT offered me a fellowship for my graduate work in Math.

“I have done some pretty interesting work since then – some extensions of Cantor’s work on 3^{rd} degree infinities, Calabi-Yau manifolds, and quantum differential geometries in n-space to name a few.

“These days I do mostly free-lance work designing cryptography systems for the government and collaborating with theoretical physicists.”

Diana smilingly asks, “Are we still speaking English?”

Somewhat abashed, he replies, “Oh, sorry...sometimes I get a little ...uh ...esoteric when talking about my work.”

And trying to sound casual, she asks, “Girl friends?”

And grinning, Kevin counters with a question of his own, “Do YOU play a musical instrument?”

Surprised at the sudden shift, Diana says, “What? Oh...a little guitar. If we can find a keyboard maybe we can make some beautiful music together...”

...and realizing what she has just said she blushes a little and smiles weakly.

Rescuing her, Kevin makes light of the situation, “OK, but you ought to try a full-sized guitar...playing a little guitar can cramp the fingers.”

To which Diana replies, “True... but little ones are easier to throw at people.”

Kevin chuckles and says, “Work’s for me.”

They enter the office together...both smiling.

END CHAPTER 2