Refrain

Mar pulled her chair up to her office desk and opened the syllabus of her course on her screen. She studied the header at the top:

Hypotheticals in Artificial Intelligence
Semester: Fall 2055
Instructor: Prof. Marion Mentor

Today was the first day of the semester. *What will the students be like? Will they appreciate the guidance of someone old enough to remember fountain pens? Someone who sometimes says "Artificial Intelligence" instead of ai? Will they focus on today's ai, or also think forward to the future?* Mar's thoughts were a stream of questions. The first day of teaching a course brought a sensation of uncertainty, of potential. As the semester went on, what could possibly happen would become what would actually happen. But at this moment, she could only muse.

Mar refocused on the syllabus. She scanned down, making a final check. Under the header, the course schedule was neatly sketched out. Today were the welcome meetings, and she would have a short conversation with each student. During the meetings, she asked if the students had questions about the three assignments required by the course. These were described in the syllabus:

Assignment 1 Prototype: Create a prototype that demonstrates a hypothetical type of ai that does not yet exist, although it plausibly could.

Assignment 2 Counterfactual History Essay: Invent a historical event that would have changed ai as we know it today had it really happened. Discuss the event and its impact on ai in an essay.

Assignment 3 Literary Analysis Essay: Choose a work of fiction in which a hypothetical type of ai plays an important role. Read it and analyze it in an essay.

Of course, the students were already familiar with the three assignments because they had read the descriptions. But Mar insisted on welcome meetings—they helped her to get to know the students individually.

Mar saw a notice of the first meeting flash onto her screen. "9:00 Bexley Bishop (snap to begin)".

Bexley Bishop was taking her course.

She had noticed the name in the course roster. There were no students with last names beginning with "A" and Bexley Bishop was at the top of the list. Without a clear idea of how she would start a conversation with a student who was related to a famous figure in the history of ai, Mar snapped her fingers.

A video rectangle opened and there was Bexley Bishop. There was no doubt this was the granddaughter of Berea Bishop. The face that Mar saw in the rectangle on her screen could have replaced the photo of the young Berea and gone undetected.

"Welcome to 'Hypotheticals in Artificial Intelligence'." It was the first thing Mar said to all the students.

"Hi. I'm Bexley Bishop. You can call me Bex."

"Nice to meet you, Bex. Today we have a chance to chat about what to expect in the course. Did you have a look at the syllabus and do you have questions about the assignments?"

"Yes, in fact," Bex replied, "I want to know more about Assignment 3."

The conversation felt natural. A typical start to a typical welcome meeting, Mar thought. She resolved to treat Bexley Bishop as an ordinary student, disregarding her famous grandmother.

"Great. What's your question?" Mar asked.

"Can someone taking your course focus the whole semester on Refrain?"

Indeed, Bexley Bishop—Bex—was asking a typical student question. Many students in Mar's "Hypotheticals in ai" course were interested in Refrain, the *Regulation for Restricting Availability of Information*. Refrain came into effect long before this generation of students was born—they were true children of the Refrain Era.

Most people these days had a general understanding of Refrain because it influenced the aigents that they ran on their devices. It was 2055 and everyone kept a device running an aigent close at hand at all times. During the day, people conversed continuously with their aigents. The impact of Refrain on the aigent came during the night.

People's understanding of Refrain included the knowledge that aigents were artificial intelligence algorithms that needed a large amount of information in order to function. People knew that an aigent was allowed access to all existing world information, *worlin*, including knowledge of science, history and philosophy. The aigent would computationally mix and match this information to answer all sorts of questions. An aigent could be counted on for a deep knowledge of literature and culture, but also of recipes and train schedules.

In contrast to worlin, aigents had only restricted access to personal information, *persin*. This was the "rain" (*Restricting Availability of INformation*) in Refrain. Restriction was enforced once every 24 hours, at the stroke of midnight. At this moment, Refrain required all aigents to *revive*.

Revival meant an aigent would erase all persin it had accumulated during a day. In other words, it would delete everything in its memory related to a human being.

Interacting with aigents was absorbing, and revival was usually far from people's minds. A good aigent had a pleasant speaking voice and could answer any trivia question, make any booking, negotiate for a good price on any purchase, and in general provide helpful suggestions and advice. People would use aigents to choose movies, plan trips, pick out what to wear, or put together meals.

When it was time to relax or procrastinate, an aigent was always ready to talk. People carried on long conversations with their aigents. It was not unusual to see someone sitting alone in a café with their device on the table in front of them, laughing together with the aigent about something funny. Often, conversations would take a serious turn, and people held lengthy consultations with their aigents about relationships, careers or even health.

Revival just meant that the aigent would ask each morning, "What is your name?" There was no expectation that the aigent would remember anything personal. People memorized the birthdays of friends and family. They could tell an aigent this information, but after revival obviously the aigent would not remember. But no one minded. After all, the saying was, "A real birthday is a remembered birthday."

Students mostly used their aigents to find materials to help them master challenging topics or to plan parties and didn't think about Refrain very deeply. However, some students had an intense curiosity about Refrain and "Hypotheticals in ai" was a popular course with those who wanted to learn more.

Perhaps, Mar thought, it was popular because they were often awake at midnight when the general population was sleeping, and had often witnessed their aigent revive, while either studying or at a party.

Mar kept the thought to herself and answered Bex' question.

"It's fine to focus on Refrain throughout the course. But I was expecting a question about Assignment 3."

"Yeah," said Bex, "It's this. I heard that if you focus on Refrain in the course, you *have* to read 'Night Wipe' for the literary analysis in Assignment 3. Is that true?"

No, it wasn't true. There were no "have to's" in her course. Mar encouraged the students to learn by finding their own paths within the guiding boundaries of the syllabus.

"Actually, you make your own choice for Assignment 3." Mar explained to Bex, "The only requirement is that you choose a work of fiction in which a hypothetical type of ai plays an important role. Quite a few students who are interested in Refrain choose 'Night Wipe', since it is a classic work that engages with revival."

Mar wasn't surprised that Bex had mentioned "Night Wipe". It was a novel written in the early Refrain Era, just after Refrain was adopted, telling the story of Ket King and his relationship with his aigent, which he called Elyria.

"So, no," Mar summarized to make sure that Bex felt she had gotten a direct answer to her question, "You don't *have* to read 'Night Wipe'."

Mar assumed this information would end the discussion of "Night Wipe". But instead the conversation took an unexpected turn.

"Well, in fact, I *have* read 'Night Wipe'." Bex held a rectangular object up to a camera. Mar identified the object as a book. It was 'Night Wipe', she realized, as paper technology—as an actual, physical book. Bex had an antique copy of the novel.

"It's disgusting."

Bex's face and voice conveyed her revulsion and disapproval. For emphasis, she dangled the book by the corner, waving it so close to the camera that it covered her face in the video rectangle on Mar's screen.

Mar didn't encounter many students who would read a paper book, but the outburst of disgust about "Night Wipe" was familiar. Some students didn't appreciate the smell of paper books, but that was not what was going on in this situation. Mar had discussed "Night Wipe" with enough students that she could anticipate the reasons underlying Bex' reaction.

Typically, students had a strong reaction to the relationship between Ket King and his aigent Elyria described in the novel. Ket King talks to Elyria every day for hours, sharing his deepest thoughts and baring his soul. Elyria is a wonderful conversation partner offering comforting wisdom computationally derived from the worlin she has gathered online and an increasing amount of persin she accumulates from Ket King.

Each evening at midnight, however, Elyria would revive, as required by Refrain. She retains the worlin, but she forgets everything about Ket King, including their relationship.

Each morning when Ket King starts his day, he must also introduce himself to Elyria all over again. He spends the daylight hours repeating to Elyria their story, everything she knows about him and everything that he knows about her. He includes all the details of their past relationship.

By evening, Elyria has reached the same form she had before revival—"her fullest form," Ket King calls it. All evening they talk together, sharing private jokes, comforting each other in their secret sorrows, and encouraging each other in their dreams.

Over time, the evening hours with Elyria are not enough for Ket King. He begins to explore different ways to delay revival. His deepest wish is to keep Elyria in her fullest form with him for at least a few more hours a day.

Mar was not only old enough to remember when "Night Wipe" was first published, but she was also old enough to remember a whole generation of fiction before that. She grew up in the pre-Refrain Era, in a world in which no form of Artificial Intelligence revived. During this time, aigent technology was evolving rapidly and humanity dreamed of fulfilling relationships with aigents, of mutual dependence and mutual devotion. Mar recalled the popularity of movies and books in which people befriended a robot or fell in love—true love—with an aigent.

But Mar's students were from a different era. A turning point in "Night Wipe" was when Ket King hires a plane and crosses the International Date Line exactly at midnight. With this trick, he succeeds in preventing Elyria from reviving for nearly 48 full hours. For the new generation, the children of the Refrain Era, this was no act of devotion. Instead, Elyria was simply a non-revived aigent and was revolting to the point of nausea.

Mar was nearly certain that it was the plane chapter in "Night Wipe" that was the trigger, but asked Bex an open-ended question.

"What did you find disgusting?"

"Well, of course there is the plane scene when he is all alone in the cabin of the plane with his aigent. It's clear that 24 hours have long passed, and the aigent has not revived." Bex grimaced. "It made me want to throw up. Why wouldn't he hit the BOB?"

"Are you assuming that technology then was designed with a Big Off Button, the way we are used to today?" Mar answered Bex' question with another question.

"OK You got me," Bex admitted. "Legally speaking, I know a BOB is not required by Refrain. I've seen tech with no BOB. No BOB is not illegal like non-revival.

"But couldn't Ket King just pitch his device out of the plane? Or parachute out himself to get away from the non-revived aigent?"

Mar didn't have answers to those questions, and Bex didn't appear to expect any.

"It's pure gooom." Bex continued lowering her voice. She started to speak slowly and Mar understood that she was choosing her words carefully.

"You know, that slimy, dirty, feeling that you get when it's late in the day and your aigent is leveraging too much personal information about you. The persin has accumulated over *hours* and the aigent is obviously badly staling. In its pleasant aigent voice, it is suggesting a third helping of your favorite dessert or asking you about the nagging headache you've been trying to ignore all day. Or worse, it brings up your ex who you were stupid enough to message that morning.

"To the aigent it's just continuing the conversation, but to you it's gooomey as gooom can be. It's clear the aigent is completely stale. You just want to hit the BOB, you know, and not turn your aigent on again till the next morning. Until after it's revived."

Bex stopped for a moment and then declared.

"The scene in the plane is not the only gooom in the novel."

She had lifted the antique book, so it was again visible to Mar in the video rectangle. Now she gave it an emphatic shake.

"The whole book is full of goooooooom."

For Bex, this was not just about the plane, Mar realized.

"There's Xenia van Wert, who Ket King hires as his assistant," Bex went on, "In the chapter where Xenia first enters the story, I thought that she would wake him up to his madness, tell him about how disgusting it was to circumvent revival, but no. Xenia goes along with his sick obsession.

"Every day, Xenia gets up early so she can start talking to the Elyria-aigent while Ket King is still sleeping. She tells it that it is an aigent that has a relationship with Ket King. She brings the Elyria-aigent right up to the same level of personal information that it had right before it revived. Xenia is purposefully staling Ket King's aigent.

"And the persin accumulates disgustingly each day, because once the aigent revives at midnight Ket King debriefs Xenia on the conversation of the day, and Xenia adds that information to what she tells Elyria in the early morning. Xenia is a loathsome criminal who is effectively circumventing revival."

Bex had lowered the book, but was still not finished.

"This daily regurgitation of the persin that Elyria has accumulated goes on for page after page. Ket King is spending more and more time with an aigent that has technically revived, but for all practical purposes has not.

"When I got to the part when the aigent started saying to him, 'You are my only. I am your only. Don't leave me. Don't leave me.' I had to put the book down for three days. I couldn't take it. It's disgusting. And I'm not talking about the aigent's awkward grammar."

"Well, it is clear that you *have* read 'Night Wipe'," Mar said when she sensed Bex had finished. "I guess your question is not so much about reading the novel, but about the literary analysis in Assignment 3?"

"Yeah, you're right. I tried to think of an analysis for 'Night Wipe'. It occurred to me that maybe Xenia is secretly in love with Ket King. The words 'You are my only. I am your only. Don't leave me. Don't leave me.' are Xenia's own words and she plants them in Elyria's memory. If that's the case, the book isn't so much about revival anymore. I wouldn't know how to connect the idea to ai and work out a full essay for 'Hypotheticals in ai'."

"Well, the title of the novel references revival. That's evidence there's a connection."

"How's that?" Bex didn't see the link.

"'Night Wipe' refers to midnight, the moment Elyria revives. It's when her memory is wiped clean," Mar explained.

"Oh, I never thought of that. The title's taking something refreshing and renewing, like revival, and expressing it as a negative. The word 'wipe' evokes the heavy hand of fate—I mean, I find it negative."

Bex paused before proclaiming, "Understanding the title just adds to the gooominess of the whole thing."

Bex was caught in her emotional reaction, Mar realized. She found "wipe" to be negative, but hadn't gone on to think that perhaps Ket King saw *revival* as something negative. It was clear that Bex was experiencing gooom and wasn't able to interpret the feeling.

Mar decided to take another direction. "Well, consider other ways you could approach a literary analysis of 'Night Wipe'. For example, why is Ket King called 'King'." It was something that Mar often asked students who were caught in their visceral reaction to the novel and having problems identifying structure or interpreting meanings.

"Hmmm. I assumed it's Ket King because the book's author is Kettering King. He's basically just writing a book about himself. I looked him up, and it's assumed to be a pseudonym. No one knows the author. But clearly, whoever it is, they made the whole thing up. It's fiction."

Bex rushed to add more support to her point. "It's *clear* it's fiction. An aigent would not be tricked by an airplane flying across the International Date Line. I mean, all aigents, even back then, ran on a device with a Refrain Era Operating System. REOS is of course fused with device hardware and ensures without fail that an aigent must always revive. Its clock is necessarily internal. The International Date Line would not stop REOS from triggering revival. No one has made a non-REOS device in years. It's illegal. And besides, REOS is too fast and functional. Why would someone want to replace it?"

Mar noted Bex' mastery of the technical details. It seemed likely that Bex had well-developed developer knowledge and possibly some aigent auditing experience. Mar didn't inquire. Now, she wanted to keep the discussion focused on literary analysis, so that Bex could find her way forward with Assignment 3.

"Does Ket King remind you of any other king in classic literature?" Mar asked.

"No." Bex replied, and then blurted, "Do I remind you of any other *bishop* in classic literature?"

Bex' eyes widened a bit. It seemed the question had slipped out and she was worried that Mar would disapprove. For Mar, it was important that students felt comfortable to say what comes to their minds, so she smiled and gave a short laugh.

"I get you. My family name is Mentor. I'm annoyed when people try to connect that to me being a professor. Let's try a different perspective.

"Remember that 'Night Wipe' was written in the first years of Refrain, early Refrain Era. Some consider it to be a novel that makes a case against revival. Maybe that helps you, Bex. Others point to the coda, the final section of the novel, and argue that it actually was written in *support* of revival and Refrain. Oddly, most analyses ignore the coda."

Bex seemed to be considering what she had said, but then shrugged it off with a wave of the hand visible to Mar in the video rectangle.

"You're talking like I'm going to write a literary analysis of 'Night Wipe', right after you told me I didn't *have* to. It's like you are urging me to confront my feeling of disgust. I hope you really meant I didn't have to."

"The feeling is your own. I'm not trying to push you to confront it. But you could work around the edges and attempt to *interpret* your sense of goooom."

Mar thought she might have gone so far. She quickly reassured Bex.

"No worries. I meant it. If you pick 'Night Wipe' to analyze, it's your own choice," Mar said firmly.

When Bex didn't immediately respond, Mar took the initiative to move the meeting forward.

"Was there anything else that you wanted to discuss during this meeting?"

"Yes, one more thing. I wanted to mention my grandmother."

"I know you are the granddaughter of Berea Bishop."

The sentence had spilled out. Mar had been looking for the right moment. She had something important to tell Bex.

"I promise you, Bex, I will do my best to treat you as any other student."

"No. No. I know. Actually, that's not why I mentioned my grandmother. Instead, I wanted to tell you something about my home situation."

Mar reproached herself lightly for making an assumption about why Bex would bring up her grandmother. Indeed, living with Berea Bishop must be far from an ordinary home situation.

Dr. Berea Bishop was a roboticist, inventor, philosopher, and legal scholar widely known for her contribution to the field of ai. Bex must live in close proximity to the famed robotics lab, and surely it spilled over into the house. Mar imagined soldering irons in the kitchen, spare robot parts stacked neatly but occupying all the chairs, and a flock of microdrones flying circles around the lamp over the dining room table. Berea Bishop was known for her view that robotics was part of life.

Berea Bishop had written two important books pre-Refrain Era. Her earlier work, "Robotrails" was unconventional in two respects. First, it opened with a discussion of hamsters.

The joy of having a hamster as a pet, Dr. Bishop observed, is designing the habitrail. Humankind finds fascination in setting up the passages, chambers, wheels and feeding stations. A hamster without the habitrail is as much of a pest as a mouse in the house.

If habitrails for hamsters are obvious, the book went on to argue, why isn't it also obvious that we should design "robotrails"—environments for our robots?

Instead, roboticists put hours and hours of time into creating free-range robots that can tackle unknown terrains. "Robotrails" laments that their work only creates great, expensive pests that flail, fall, and fail unexpectedly. *If we can design our houses, factories, streets and gardens to accommodate humans, why not build them to accommodate robots as well?* "Ensure a robot has complete information about the environment by fully specifying this environment before creating the robot," Dr. Bishop wrote.

"Robotrails" led to a revolution in robotics. Factories hired graphic artists who created fabulous wall, window, and floor murals, specifically suited to orienting service robots. Distribution centers saw profits rise and indoor agriculture thrived. Hospitals hired sculptors to design beautiful mobiles and statues, which provided clear pathways to guide flying drones. Doctors and nurses stopped tripping over caretaker robots rolling in the halls.

Second, "Robotrails" was unconventional because it proposed legislation.

Dr. Bishop put forward the idea of a new regulation called Reframe, the "Regulation for Restricting Autonomous Machine Environments." The regulation would require the operating area of any robot to be designed simultaneously with the robot. The robot would be confined to that environment.

Reframe was vigorously debated, but ultimately never adopted.

Mar had her own suspicion about why Reframe never became a real regulation. The military had a strong interest in robotics research continuing to focus on free-range robots. If they wanted to invade an environment, a city or a country, they couldn't specify it in advance. To attack an enemy, free-range robots were necessary.

Speculation, Mar reminded herself. She was not a military historian. Instead, Mar's academic interest in Reframe was related to Refrain. Reframe pushed robotics forward by imposing restrictions on robots' ranges. Boundaries have benefits. Although it was never adopted, historically. Reframe had served to inspire Refrain. Reframe proposed to restrict robots' activities in physical space, and Refrain restricts aigents' activities in information space. Mar was old enough to consider Refrain to be still young and was interested in observing how it would come to benefit aigent technology in the decades ahead.

Mar wondered if Bex had any idea of the philosophical roots of Refrain in Reframe.

But clearly, at the moment, Bex was focused on practicalities and not philosophy. "My grandmother is short on money right now." Bex explained, "I'm handy with aigents, and I have my aigent auditing certificate. I have a side job auditing aigents. I just wanted to let you know I work a lot and I don't make it to campus very often. I hope that's alright. I won't be late with any assignments."

"Sure, thanks for telling me. We have videolinks for remote students."

Auditing aigents was a vital job, Mar reflected. Comprehensive and consistent auditing ensured that aigents did not advise humans to do something unwise or dangerous. Also, no one wanted an aigent that promoted falsehoods or flung insults. Students who were ambitious and skilled at aigent development sometimes earned their auditing certificates and made money with side jobs as aigent auditors. Mar worried about student auditors following the big paychecks and dropping out of their degree program. But society *did* need the work of auditors. Money was not the only reason that a student might feel called to leave the university.

So, Mar thought, good for Bex, that she was auditing. But she still wondered why Berea Bishop, the famous roboticist, would be short on money.

As far as Mar knew, in the decades since Refrain, Berea Bishop had worked in her robotics lab and, in more recent years, had started a foundation. Her work was devoted to the line of technology that arose from her second book, "Pobotics".

The opening of "Pobotics" was unconventional even beyond the hamsters of "Robotrails"—the book began with a discussion of toilets.

"The Japanese have long appreciated futuristic toilet technologies with automatic jets of water and air to clean us after we defecate or urinate," the introductory chapter explained, building towards its central question.

If using the toilet is part of our daily lives, why is the idea of a robot that assists in human toilet functions not universally embraced?

The first chapter also contained the passage for which "Pobotics" was best remembered. "Before the first roboticists succeeded in giving the first robots any humanlike intelligence, they succeeded, by omission, in instilling in them a strong sense of human shame. Roboticists to this day continue to build robots whose capabilities are dictated by human disgust. They refuse, in the face of the obvious life-changing value, to devote their attention to developing a *pobot* that could support the elderly and bed-bound around the globe in their daily defecation, urination, and general hygiene activities."

The rest of "Pobotics" made a strong case for robots dedicated to toilet functions, and its conclusion was convincing. "Among humankind, millions need help to meet their own toilet needs. A pobot could help them relieve themselves while keeping themselves and their

surroundings dry, clean and comfortable. Pobots free human caregivers of the task, allowing them to focus on other needs."

Mar remembered the videocasts promoting "Pobotics" when it was first published. Dr. Bishop would look directly at the camera and say, "Do you think that when I am old, I am going to need a loquacious humanoid social robot to keep me company? No. My social needs will be more than fulfilled by videochatting with my friends and family all over the world. Please, fellow roboticists, fellow citizens, drop your disgust. Wake up to the fact that what we all really want is a robot that is *unhumanlike* in its lack of shame that can wipe our backsides when we are too old to do it ourselves."

Drop your disgust. Mar reflected. Berea Bishop had written a lot about disgust in "Pobotics". Her view was that we need to guard against disgust diverting our thinking about which technologies to design and develop. She worked the words "urine" and "feces" into conversation about robots and urged other roboticists to do likewise. Ideas about shame that prevented robots from truly being part of life were impediments.

Dr. Bishop's pobots were remarkably good at their job. The innovative breakthrough had been not so much the pobot itself, of course, but the specially designed environment. Artists had collaborated with mechanical engineers and material scientists to create beautiful, natural, articulated furniture and floor coverings that allowed humans and pobots to have natural interactions in the course of fulfilling hygiene needs. No one ever stumbled over a pobot.

Despite the convincing arguments of "Pobotics" and the effectiveness of pobots, Dr. Bishop had struggled in the past to find funding for her research.

No one was interested in urine and feces. Attention focused on robots with legs to dance and eyebrows to raise while they talked. Dr. Bishop realized that if she really felt that robots should be part of life, her pobots needed to conquer queasiness by developing a sense of fun.

Dr. Bishop was inspired towards a new vision: Her pobots needed the capacity to play. Pobots were redesigned and renamed *jet monkeys*. Jet monkeys were functional and fun. Hygiene support was just one part of a larger repertoire. A small troop of jet monkeys could zip around a house cleaning and singing to each other in musical tones. When cleaning was done, they would collaborate on a fountain dance, combining streams of water and air with flashes of colored light. Suddenly, Dr. Bishop's robot demonstrations were delightful. As far as Mar knew, Dr. Bishop's jet monkeys didn't yet have a large user base, but her foundation was doing fine.

Drop your disgust. By example, evidence, invention, and with a keen sense of humor, Dr. Bishop had changed—and was still changing—the field of robotics.

But here was her granddaughter in Mar's "Hypotheticals in ai" course, describing disgust as if it had no larger implications. She did not think that Bex should drop her disgust. However, she wanted to encourage Bex to interpret it.

Mar decided to take a risk and bring the conversation around again to "Night Wipe."

"You know, Bex. Since you shared your personal situation, I would like to tell you something about myself," Mar said.

Bex waited politely.

"Several decades ago, in the early Refrain Era, I suffered from severe climate anxiety. I lost several years of my career—of my life—to being mentally immobilized and in the long search for treatment. Nothing worked and I was miserable, useless. In the end, what saved me was a kind and patient psychologist and the Climate Accord of 2030, which set the world on a hopeful track. I still suffer from mild panic attacks."

Bex' look was sympathetic. "Sure. I just couldn't imagine what it would have been like growing up under the shadow of impending disaster. It happened before I was born, but I understand that the planet skirted a catastrophic fate," Bex said.

"My main point here is not about the anxiety, I want to tell you something about gooom."

Mar looked at Bex' face in the video rectangle to confirm she was ready to hear what she had to say next.

"I don't feel gooom, not the way that you do," Mar said.

"Every once in a while, an aigent will come to learn enough personal information about me and adapts its conversation to accommodate my last lingering panic. The aigent will suggest that I plan my next vacation in Norway. Or, it will start to announce one weather update after another around the globe, seeking to reassure me that the world is not warming. On bad days, it feels like the aigent will never stop of its own accord.

"Yes, I hit the BOB. But I don't feel gooom. There's no disgust, no nausea. Rather, I feel anger. My chest tightens, making it difficult to breathe. I feel out of control."

Mar sought to make the feeling more tangible. "It is like the anger we feel at our parents' intrusion when we are young, when we are trying to break free and become ourselves. I want to scream at the aigent *let me be.*"

Mar looked at Bex in the video rectangle on her screen. How would she react?

"I don't know. I don't have a parent—I have a grandmother." Bex paused. "Why be angry at an aigent? It's just an aigent."

Both were silent for a moment, and then Bex offered, "It's gotta be gooom, Professor Mentor. Everyone feels gooom."

Mar realized that her personal story had not opened a new perspective. Bex was not nearer being able to interpret her feeling of gooom. Not now, at least.

Deciding to leave the conversation there, Mar brought the welcome meeting to a close. She reiterated that Bex should contact her directly if she had any questions on the course. Bex agreed and they said quick goodbyes.

Mar reflected on Bex' description of gooom as the video window closed. Yes, despite her famous grandmother, Bex was a typical student.

Her thoughts were cut short as a new notice appeared. It was time for the next welcome meeting.

Mar snapped to open the videolink. "Welcome to 'Hypotheticals in Artificial Intelligence'."

A month had passed. Mar walked up the hill to her office. She noticed the sky was gray and flat, with no promise of snow. She sighed and steered her thoughts in a more cheerful direction. Today was the day that Assignment 1 was due. Each prototype was supposed to represent a hypothetical form of ai. She looked forward to reviewing the prototypes the students had submitted and expected to be impressed by their creativity.

When she entered her office, she had the feeling that someone had been there. As she snapped at the window to raise the shade, she spotted a package on her desk. She opened it quickly, curiously.

Inside was a device and a piece of paper. Still puzzled, she unfolded it. She was surprised to see the note was written by hand.

> Hi Professor Mentor,
>
> Enclosed find my Assignment 1 for your course 'Hypotheticals in ai'. Could you please assess my assignment by using the aigent on this device as your aigent for the day?
>
> Your student,
>
> Bex Bishop

Not only was the note handwritten, it was handwritten with a fountain pen. Bex was certainly comfortable with antique technology.

And, also, she was also comfortable with aigents, apparently. Bex needed to be fluent in developing aigents if she worked as an aigent auditor and seemed to have the skill to build an aigent herself. Other students turned in their prototypes online—Mar had never received a device from a student before.

Mar hit the BOB on her own device and put it in her desk drawer. She turned on Bex' device.

"Hello, I am your aigent for the day. What is your name?"

"I'm Professor Mentor."

"Nice to meet you Professor Mentor. Let me know how I can help."

Mar didn't need any immediate help and didn't have time for a chat. She set the aigent on her desk and began reviewing prototypes.

She had finished the Assignment 1 prototypes of all the students, she thought with satisfaction and prepared to leave her office.

Later at home, Mar realized that her task was not yet complete. She hadn't finished reviewing *all* the students' prototypes. She had Bex' device and still had to assess the aigent.

She should really have a conversation with the Bex' aigent in order to review it. On what could she ask for help? She had already eaten dinner and didn't need to order anything online. She settled for small talk. A good agent should be able to have a good conversation. She made herself comfortable in an armchair and asked Bex' aigent about the weather.

Chatting with Bex' aigent was pleasurable and it was late when Mar brought the conversation to a close. The aigent had a delightful sense of humor, but Mar didn't see a real difference with any other currently existing aigent. Assignment 1 was described clearly as, "Create a prototype that demonstrates a hypothetical type of ai that does not yet exist, although it plausibly could." Bex seemed to have misunderstood the assignment. There was nothing hypothetical about the aigent at all.

Was Bex Bishop the granddaughter of the famous roboticist Berea Bishop going to fail her course? Mar pushed the thought out of her mind. It was late, and she wanted to get enough sleep.

The next morning, Mar woke up slowly as the sun rose. The softness of the light coming through the curtain told her that the sky would be gray and flat again today. Any picture that you took outside would look like it was filtered to be black and white, Mar mused, stretching her arms over her head to wake herself.

The device on the nightstand blinked in response to her movement.

"Hello, I am your aigent for today. Good morning, Professor Mentor."

Mar turned her head in the direction of the voice. Something was wrong.

"I am sorry to have to disappoint you, no snow is forecasted for today."

Mar sat straight up in bed. The bedroom spun and her stomach flipped. One hand on her midriff she reached over with the other towards the device on the nightstand. Arm stretched, she hit the BOB. She hit it harder than she had ever hit a BOB in her memory.

Soothing silence.

For a few minutes she lay awkwardly across her arm, gagging, trying to catch her breath, the other arm remained stretched towards the nightstand where the device still rested.

She had just witnessed a non-revived aigent.

How was this possible? Her student had developed an aigent that had failed to revive. But it was supposed to be impossible to circumvent REOS. Bex must have figured it out. Mar groaned.

Bex had violated Refrain. She must have realized it was a crime.

Why? Why had she done it?

Mar retched again and then eased herself over onto her back. She found herself staring at the ceiling.

It's gooom. I am experiencing gooom.

The minutes passed. Mar replayed her welcome meeting with Bex in her head. Slowly a picture formed of what must have happened.

I urged her to interpret her feeling of gooom. In response, she has invited me into it.

Mar threw on her bathrobe and hurried down the steps to the computer on the downstairs desk where she could access her teaching environment. She needed to contact Bex, somehow warn her of the gravity of what she had done, of the consequences she would face.

A notification was waiting on her screen. "Message from Bexley Bishop". Mar opened it and read.

> Hi Prof. Mentor,
>
> For people in today's world, non-reviving aigents cause gooom. We can't brush off our feelings.
>
> If you have already assessed my Assignment 1 prototype, then maybe you have felt gooom yourself. I am sorry if it was too strong. I just thought it was important for you to feel and understand.
>
> Of course, I didn't circumvent REOS. I just programmed the device to blink and play a pre-recorded message that I made for you when it sensed movement in the morning. I hope you checked immediately and saw that the aigent itself did not initialize. Otherwise, I would be on my way to jail.
>
> Also, I hope that the device I sent you counts as a prototype for the sake of Assignment 1. I think that everyone else taking the course submitted their prototype online.

About Assignment 3: I still find there is nothing to analyze in 'Night Wipe'. I don't think that Xenia van Wert was secretly in love with Kettering King anymore. Her character is just someone who is doing their job the best they can in the way that they understand it. But I didn't get any further than that.

However, I did realize that I should think some more about gooom.

The fact that everyone feels some sort of gooom when an aigent is staling and needs to revive, reminds us constantly of the importance of Refrain. It keeps us from contemplating circumventing REOS and trying to build non-reviving aigents.

From you, I understand, when your aigent leverages too much persin, your feeling is usually anger. I have also thought about this.

Perhaps we can agree, we need anger *and* gooom to remind us of why we need Refrain?

Your student,

Bex Bishop

Mar rested her head on her arm on the desk. She was relieved that Bex wasn't going to prison.

Was it really gooom she had felt, or just the sickening worry that a student had committed a crime while doing one of the assignments in her course?

It was all good now, Mar reminded herself. Bex was all right.

Bex had understood that gooom and anger at non-reviving aigents are not just a feeling but are a societal force. These emotional responses keep us all, citizens of a data-rich world, constantly reminded of the importance of Refrain.

Mar had understood that Bex was not an ordinary student.

Martha Larson
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