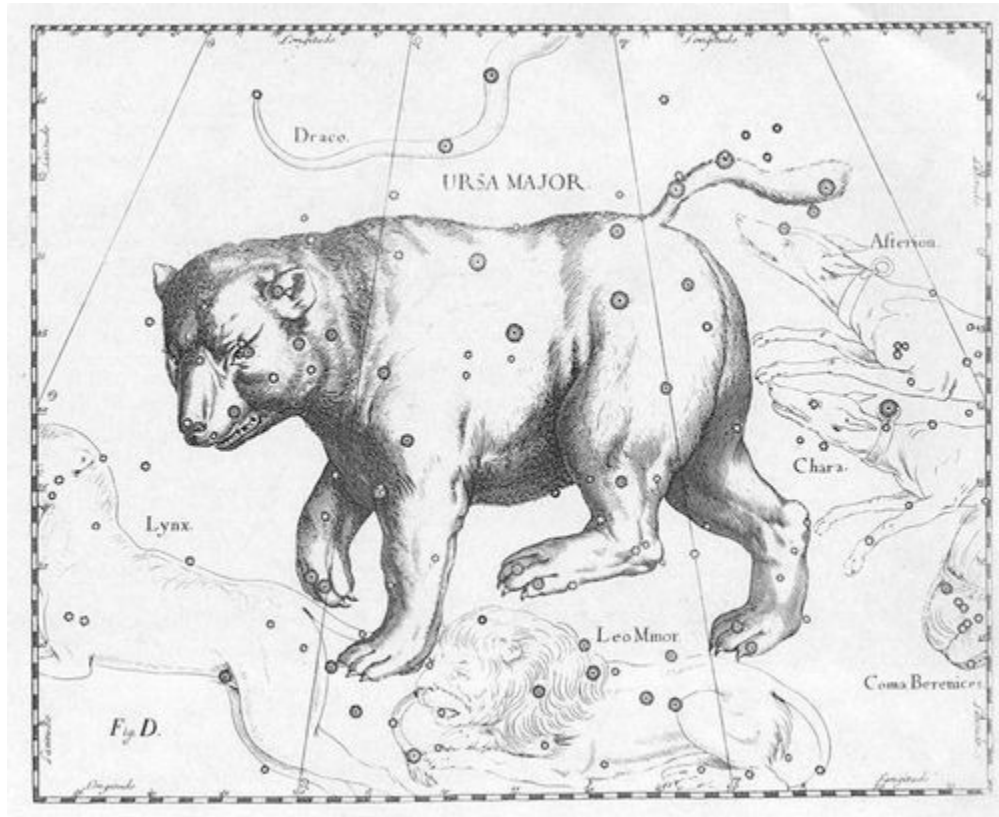


Field Trip

by Aditi Sriram



Jeremy couldn't believe his luck. The morning of his 6th grade field trip to the Rose Center for Earth and Space at the Museum of Natural History, he fell ill. "This can't be," he thought. "Science is my favorite subject, and I'm not going to be able to go to the Museum with Mr. Connolly and my friends?" He pleaded with his parents to let him go to school anyway, but they were firm in their refusal. "The sooner you rest at home, the sooner you'll get better," his mother said. "Don't be so hard on yourself, champ," his father said. "We can always go another time."

"I won't be with Mr. Connolly and my science class if I go another time," Jeremy protested. "It won't be the same."

"It won't be the same if you're feeling ill at the museum either," his mother said, trying to reason with him. "Now take this medicine and go lie back down."

Jeremy closed his eyes as he swallowed the white tablet with a gulp of water. "What if I feel

better before the field trip begins?"

"We'll decide then," his mother said, while his father nodded.

Jeremy returned to his bed, fuming. Even though it was sunny outside, he felt a black cloud hovering over his head, threatening stormy weather inside his brain and making him angry. But soon after he lay in bed, the medicine his mother had given him began working, and he fell asleep almost right away.

When Jeremy awoke, his room was bathed in darkness. Outside his window it was dark, too. What time was it? Had he slept through the day? Was it the next day? Was it the middle of the night? Jeremy was completely confused. "Mom!" he called out.

Jeremy's dad walked into his room with a smile on his face, and wearing his hiking shoes. "Champ! You're awake," he said.

"What time is it? Did I miss everything?"

Jeremy's dad put a hand on his forehead and checked for a temperature. Nothing. "Not at all, in fact, you're just in time for your field trip. If you're feeling better, that is."

Jeremy jumped out of bed, stretched, and did a little dance. His energy was back. "I'm feeling fine," he said.

"Great. Now put on a sweater and lace up your shoes and follow me."

Jeremy checked the time as he was getting dressed. 8:05 p.m. It didn't make any sense. Where could he possibly be going with his father so late in the day? Surely the museum was closed, and Mr. Connolly had gone home. But Jeremy didn't slow down. He dressed and met his father in the living room, where he was sitting with a man he had never met before, and a peanut butter and jelly sandwich, his favorite.

"I have a surprise for you," his father said. "Jeremy, meet Professor Helfand. He is a professor of astronomy at Columbia University, where they have an observatory. Do you know what an observatory is?"

Jeremy nodded. "Mr. Connolly described them to us in class when we began the chapter on planetary science. It's a viewing tower from where you can observe the planets and galaxies through high-powered telescopes, track their movements, and study their behavior." Jeremy was talking so fast, he could barely chew on his sandwich.

"That's absolutely right," Professor Helfand said, impressed. "And because you missed your field trip this morning, we're going to pay a little visit to the observatory tonight so that you can have a field trip of your own."

Jeremy couldn't believe his ears. "I'm ready!" he shouted at his dad.

"Not so fast, champ. Finish your sandwich, and then we'll go. You haven't eaten anything all day, remember?"

"I can't believe I slept all day-but this is the best night of my life!" Jeremy said with a laugh.

Jeremy, his dad, and Professor Helfand took the subway to Columbia University, where they walked to the Physics Building and took the elevator to the top floor. There were many rooms with all kinds of computers, some big and others small, some that looked like really old machines and others that looked brand new. Most had notebooks next to them, which were filled with charts, numbers, even little drawings of orbits. Professor Helfand explained that each computer was connected to a specific telescope, and that there was one person in charge of each telescope, and observing the movement of one planet, or star.

Jeremy noticed that some of the charts showed patterns: numbers that repeated, timings separated by exactly one hour. The professor showed him that the repeating numbers were distances between planets, or between planets and their moons, or distances between stars, and showed him how the orbits of these planetary bodies created patterns of collective behavior. "Because of gravitational forces," he said, "the planets and their moons have fixed orbits, and so they end up being the same distance from each other every so often. Once we have enough of these numbers written down, and have been tracking these planets' trajectories for enough time, we can create models that predict where these planets, and their moons, are going to be one month from now, or one year from now-how far from each other, how far from planet Earth, our moon and our sun."

"I keep forgetting that there is more than one sun in the universe," Jeremy said after a pause. "How many suns are there?"

"That's a great question, and not one that we have the answer to," Professor Helfand replied. "What we know so far is that planet Earth, and the seven other planets in our solar system, are part of the Milky Way galaxy, which is one of many galaxies in the universe. The farther we can see with our telescopes, and the more patterns and behaviors we can predict and detect of all the celestial bodies we know so far, the more galaxies we can discover, and the more suns we can identify. But it's going to take a lot of work to get there."

"How exciting," Jeremy said, marveling at the possibilities of discovery in front of them.

Jeremy's father called Jeremy over to the central observation deck, where an enormous telescope had been set up and positioned on a specific constellation in the sky. "Can you identify it?" his father asked him.

"I think so. The Big Dipper?"

"Absolutely right!" Professor Helfand said. "It's part of one of the brightest constellations we can see, called Ursa Major. Here's a little trick about Ursa Major and the North Star. See the two stars on the extreme right, at the bottom of the constellation?"

Jeremy looked carefully into the telescope and trained his eyes slowly to the right, where the handle of Big Dipper sank downwards and turned into a trapezoid. "Yes, I see the base of the constellation," he said.

"Perfect. Now, imagine a line connecting those two stars-they're called Merak and Dubhe-and extend it all the way up into the top of the lens."

Jeremy imagined a bright white line connecting the two stars, and stretching past them. It felt like he was connecting the dots in an art book from 2nd grade, only this was way cooler. "O-k-a-y," he said slowly. He could feel his father's hands on his shoulders, keeping him steady.

"What do you see, champ?" his father asked.

Jeremy stared into the lens, trying to stay focused. "Oh!" he shouted. "I think I see another star, but it looks bigger than all the others! Is it really a star?" Jeremy squirmed with excitement.

"Well done," Professor Helfand said. "You just located the North Star in our humongous sky. You know, Jeremy, maybe when you're older, you can join our team and help us look for more constellations and galaxies in the sky. There's so much out there that we have no idea about. Would you be interested?"

Jeremy thought about Mr. Connolly and his friends walking around the Rose Center and playing with the kiddie exhibits, while he stood here at the top of the world, looking deep into the sky. "I can't wait," he said, with a smile on his face as bright as a hundred suns.

Name: _____ Date: _____

1. Why does Jeremy miss the field trip with his science class?

- A. because his dad wants him to stay home
- B. because science is his least favorite subject
- C. because he is sick
- D. because he wanted to go to an observatory instead

2. One problem is that Jeremy is upset that he's missing his field trip. How does his father solve this problem?

- A. He shows Jeremy how to use a telescope at home.
- B. He arranges a night visit to an observatory at Columbia University.
- C. He asks Mr. Connolly to postpone the trip.
- D. He drives Jeremy to the Rose Center later in the day to meet his class.

3. Which of the following statements best supports the conclusion that Jeremy thinks discovery is an exciting part of science?

- A. Jeremy asks Professor Helfand "how many suns are there?"
- B. Jeremy refers to the night as the best night of his life.
- C. He is angry that he cannot go to the Rose Center.
- D. Jeremy was "marveling at the possibilities of discovery in front of them."

4. At the end of the story Jeremy refers to the exhibits on the field trip as "kiddie" exhibits. What does this suggest he feels?

- A. He is only interested in astronomy if he can use a telescope.
- B. He feels that science is a subject for little kids.
- C. He's lost his interest in space because he missed the field trip to the museum and ended up at the conservatory.
- D. He has learned something he considers more grown up and useful at the conservatory than he would have on his field trip.

5. What is the story mostly about?

- A. The many things Jeremy learns on his trip to the observatory
- B. The day Jeremy stays out home because he is sick
- C. How Professor Helfand became interested in astronomy
- D. Jeremy's field trip to the Rose Center

6. "Not so fast champ. Finish your sandwich, and then we'll go. You haven't eaten anything all day, remember?"

Why might the author have included the above sentence?

- A. to point out how difficult it is to eat when you feel sick
- B. to show how strict Jeremy's dad is
- C. to show the reader what kind of food Jeremy likes
- D. to illustrate how excited Jeremy is

7. Choose the answer that best completes the sentence below.

Jeremy gets too sick for his field trip and _____ learns what it might be like to be a real scientist.

- A. consequently
- B. previously
- C. on the other hand
- D. in particular

8. Jeremy wants to be a scientist when he gets older.

Use evidence from the text to support this statement.

9. What does Jeremy learn about the stars and universe from Professor Helfand?

10. What does Jeremy learn about the subject of science and how it could apply to his future?