

Jasper



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OF THE LIBERAL ARTS

Curiosity of the day:

Finding a Planet in the Sky

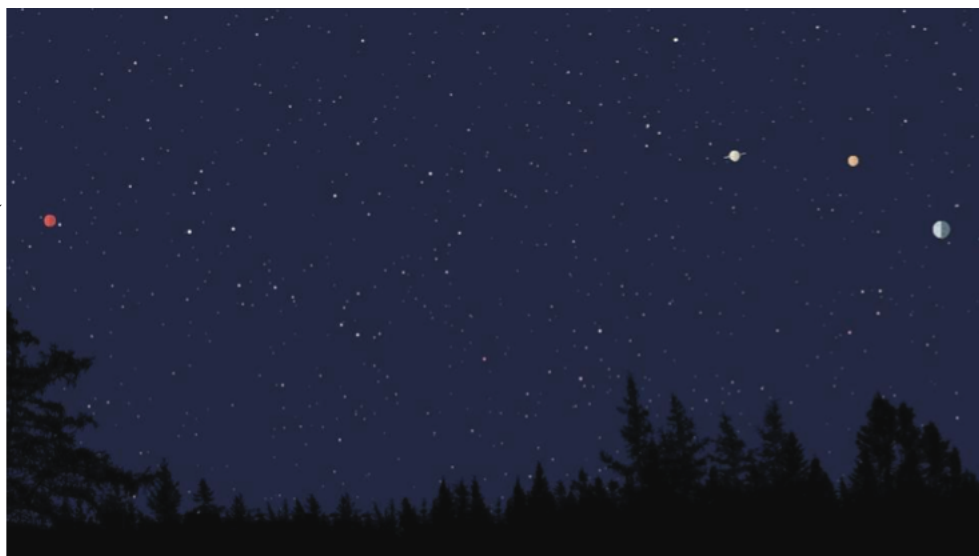
“When I consider the work of your fingers,” says the psalm, “the moon and the stars which you have set in place, what is man that you should be mindful of him, or the son of man, that you should care for him?” And yet God has made us in his image, a little less than the angels, and given us dominion over the whole of his creation, to tend it and love it, and to wonder at its beauty and grandeur.

Do you know, if you were a creature on the planet Venus – well, you couldn’t be a creature on the planet Venus. The atmosphere is almost all carbon dioxide, which would suffocate you. And the temperature is more than 800 degrees. And it never gets cool at night, because Venus is blanketed in clouds so thick, none of the heat escapes, and besides, a day on Venus is 224 earth-days long. We never experience anything like that. Sometimes a day in school *seems* 224 days long, but that’s a different story.

Anyway, if you were a creature on the planet Venus, you would never see the planet Earth. That’s not because Earth would be too far away or too dark. You’d never see it, because the clouds are too thick. You’d see

light from the sun, but you wouldn’t see the sun, and you wouldn’t see the stars. You would go outside, and say, “Gosh, it’s cloudy today,” and your father would say, “Kid, it’s cloudy every day. So what else is new?” And he would go on reading the newspaper and complaining about the politicians, because politicians are the same on every planet, as you might guess.

If you were a creature on the planet Mars – and you might be, if you came from somewhere



else and you were inside a structure with an atmosphere for you to breathe – you would see the planet Earth. It would be a bright greenish star, with a small star always next to it, like a dog following his master. The dog, of course, is the earth’s moon. And you might say, “I wonder if there are creatures on that planet up there? Maybe they have antennas, or an eye in the middle of their forehead.” You could see the Earth in the sky, because the atmosphere on Mars is thin, and the light could get through.

But how can you tell a planet from a star?

The stars are unbelievably far away. Do you think a million miles is far? That is nothing. The earth is more than 90 million miles from the sun, and that's just a hop, skip, and a jump, when it comes to distances in the heavens. Do you think a billion miles is far? That is still nothing. The planet Uranus is more than a billion miles from the sun. That's still not even like going next door. It's like stepping out onto your porch. Do you think a trillion miles is far? You haven't even left your front yard. The nearest star to the sun is still much farther away than that. In any case, the stars are so far away, they appear as points of light in the sky, some brighter, some not as bright, but all of them as points.

Now, when light comes to us from a point so far away, it hits our atmosphere and the droplets of water in it, and that means that the light will wiggle, because the atmosphere is always moving this way and that. Imagine yourself at the bottom of a swimming pool, looking up toward the sun, while other people in the pool are splashing around. The swishing and swirling of the water will make it seem as if the sun is bouncing a little. That is what happens to the light from stars. It bounces around a little in the water: it zigzags a little in our atmosphere. That is why the stars seem to twinkle. If you see a twinkling thing in the sky, that's a star.

But the planets *don't twinkle*. That doesn't mean that their light is more powerful, boring a hole straight through the air. Light is just light, wherever it comes from. It's that the planets are closer to us, and *are not pinpoints of light*. They are little dishes of light. So when the light from one side of the planet wiggles toward the other, we don't see it, really, because it's just wiggling on to the middle of the dish. Oh, you may see a small shimmering effect, but mostly

the planet, the light-dish, will sit up there in the sky, calmly, minding its own business. Mercury looks reddish and is very close to the sun. Venus is a brilliant white – it is usually the brightest thing you will ever see in the sky, except for the moon. Jupiter is also white, not as big as Venus (because it is so much farther away from us), but every once in a while it will appear brighter than Venus. Mars is red, and is sometimes of a medium brightness, but sometimes also as bright as Venus. Saturn is yellowish, and looks like a pretty bright star, though not as bright as Jupiter or Venus. If you know exactly where to look, and it's a clear night, you might see Uranus with the naked eye, as a very dim and pale green star.

“But where do I look to find them?” you say.

“The sky is so big!”

“If you see a twinkling thing in the sky, that's a star. But the planets *don't twinkle*.”

That's easy. You see, the earth and all the planets revolve around the sun, but it isn't as if they did it in every direction you can imagine. They all stay on

pretty much the same plane. It's as if they were all on a big flat disk, rolling in their grooves. That means that when you look up in the sky, they will seem to be in the same path that the sun takes as it goes from morning to evening. If you live north of the equator, you will see that path in the southern part of the sky; and you will see it in the northern part of the sky if you live south of the equator. That's where the planets will be: wherever you see the sun in the daytime. If you are looking at a part of the sky where the sun never appears, there won't be any planets there, either.

“But isn't there any other way I can tell them apart from stars? I'm not good at seeing the twinkles!”

Yes, there is another way. It's the best way.

Stars are so far from us, they always seem to be in the same place. They aren't, but how could you tell from here? They are always moving, at incredible speeds, but we can't see it

at all, because they are too far off. Every time you look at the sky at night, the stars seem to be in the same places next to each other. There's the Big Dipper, and it always looks just the same. It doesn't go from looking like a Big Dipper to looking like a mongoose or a snake. But the planets are *not* that far away. If the nearest star were ten miles off, Mars would be like your finger right in front of your nose. You can't tell if a car is moving ten miles away, but you can tell if your finger is moving in front of your nose. When you see a bright light in the sky and you think it might be a planet, notice where it is in relation to the other stars around it. Is it in the middle of a string of three or four of them? Is it at the corner of a kind of box? Is it in that big empty area between two constellations? Then look at it the next night. *It will not be in the same position.* It will seem to have moved. And it will continue to move, every night. All the other stars have exactly the same pattern all the time. But the planets don't. And that is why they stick out.

It's why the Romans called them *planetae*, from a Greek word meaning *wanderer*. The stars stay put, but the planets meander here and there. Check it out.



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