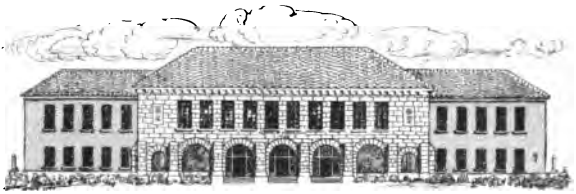
STORYLAND OF STARS



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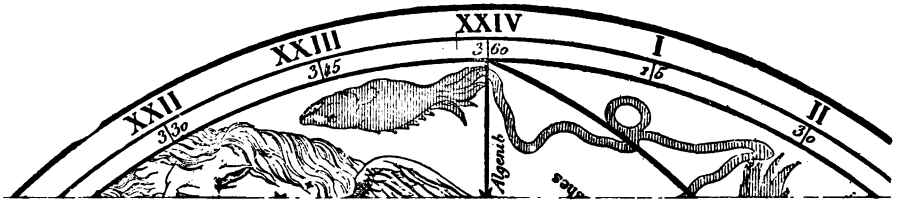
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Young Folks' Library of Choice Literature.

THE

STORYLAND OF STARS.

BY

MARA L. PRATT, Chadwick.

Author of "American History Stories,"—"Young Folks' Library of American History,"—"People and Places Here and There," — etc., etc.

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CONTENTS.

THE STORYLAND OF STARS.

What can be more in order, children, than that now, when the earth flowers are all gone, and the air, so clear and frosty, is bringing out the stars in all their brightness, we should turn to study *them* — the sky-flowers, as we may well call them?

But will they be as beautiful and as full of interest as were the earth flowers? Yes,— no,— yes,— indeed, who shall say? If you will try to tell me which season to you is the most beautiful, which flower you love best, perhaps I might find courage to try to say which of these, the earth-flowers or the sky-flowers, seem fullest of beauty and interest.

I am afraid we should all finish up as a little boy did, of whom I once read. In the winter he rushed

into the house, his eyes sparkling, his cheeks red with the pinches and bites of playful old Jack Frost, and said, "Oh, mamma, is there anything so beautiful as winter? The sleighing! the coasting and the skating! O, and the sun! See, see the sun! see how pink it makes the snow! O I wish it would always be winter!"

Spring came. The soft rains, the warm showers, brought out the clean new buds and the grasses. "O the beautiful spring!" said the boy. "It's as if the world were waking up after a long nap. I can almost see the grasses grow! How glad the birds seem! And the air is so full of flowers. Mamma, you never saw anything like the woods to-day. O I wish it would stay spring forever!"

Then summer came. The little fellow went far up among the hills to play until vacation was over. O the great, broad fields, the dark, shady trees, the soft, warm air! "Just hark, mamma," the boy would say, "you can hear the stillness! How big the world looks! I wish the summer would never go!"

Autumn came. "Mamma," cried the boy, "I believe I could paint a picture. Just see the red leaves, and the flowers — I like those dark, rich colors! And the air — what makes the dim, hazy light? So different from the clear, hot air of the summer. What could grand-mamma have meant by saying this was a sad season? — the saddest of all the year? Why, it's the brightest of them all! Would n't it be grand if the world would look like this always? I wish it would never change!"

And so it is, I think, with any of these studies that have to do with Nature. Each is of itself so beautiful, so full of its own interests, that it is hard to say which is the best. Like the little boy's seasons, the one before us seems for the time better than all the rest.

And are n't you glad that it is so? How dismal it would be if only one of the seasons were beautiful and we had to wait and wait, and long for its return during all the other three!

But dear old mother Nature is not so stingy as

that. There seems no end to her bounty. She takes away one beautiful gift only to give us another.

And now, right here, she has given us the stars, brighter and clearer than they ever are in the summer time, just because she has had to put the flowers away for their winter's rest, I think.

GOOD-NIGHT PRETTY SUN, GOOD-NIGHT!

Good-night, pretty sun, good-night!
I've watched your purple and golden light
While you were sinking away.
And some one has just been telling me
You're making over the shining way,
Another beautiful day.
That just at the time I am going to sleep,
The children there at your face take a peep,
Beginning to say good-morning just when I'm saying good-night.
Now, beautiful sun, if they have told me right,
I wish you would say good-morning for me,
To all the little ones over the sea.

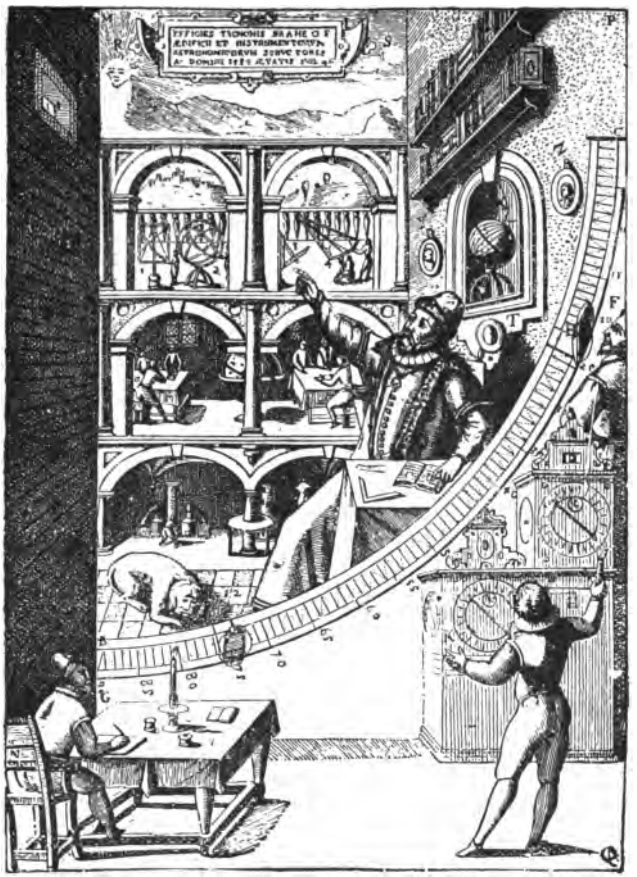
ASTRONOMY.

This is the name given to the science of the stars. It comes from a Greek word *astron*, which means *star*. Can you not think of a certain bright-faced, star-like flower whose name, now that you come to think of it, must have come from this same Greek word, *astron*?

You see then that somebody, long, long ago even, must have thought of the likeness between the stars and the flowers; so have we not as good a right to call the stars sky-flowers, as they had, so long ago, to call the flowers earth-stars?

You have no idea of the wonderful discoveries that have been made about these far-off dots of light.

By long years of hard study, astronomers have learned how far away these stars are from us, how far they are from each other, how large they are, how old they are, how much they weigh, what they have been doing,—yes, and even what they are going to do in the ages to come.



TYCHO BRAHE IN HIS OBSERVATORY.

It was strange enough to know what botanists had learned about the families, the ways, the lives and the deaths of all the plants of the great plant world; but to think of learning all about the star-world, away up there in the sky beyond reach, beyond hearing, and almost beyond sight, seems almost incredible. It is enough to take away one's breath, is n't it? But are n't we glad we have n't all this searching to do for ourselves? Is n't it good to be alive in these days of books and study, when people have already learned so much and are so eager to learn more?

Astronomy is such an old science! That is, people have been studying it, in one way or another, for so many, many years.

The Chinese, it is said, have books four thousand years old, in which are written reports of eclipses; and in one of these books, is told a story of a certain ruler in that country who was so angry with two astronomers, Hi and Ho, for not foretelling an eclipse of the sun that he had them put to death.

The Chaldeans, too, knew something about the

sky. Lying out on the hillsides through the long nights as these Chaldean shepherds did, they could not fail to notice some of the wonderful changes among the stars. They learned to know and recognize the stars as they did their sheep.

They learned that certain stars seemed traveling on, night after night, towards the setting sun; and that by and by they, too, seemed to "set," as we say the sun "sets;" they learned that after a few weeks, or months, these stars came back again, traveled across the sky, and again were lost to sight.

They noticed that the moon came just so often, stayed just so long, then, like the stars, went down and out of sight.

Wonderful stories these shepherds used to tell of the star-world,— some of them wise, some of them so foolish you would wonder that any one could believe them.

EARLY ASTRONOMERS.

It is to the Grecians that we owe the first discoveries that have proved to be of any real worth.

Seven hundred years B. C., a wise man named Thales declared that he no longer believed that the earth was flat, or that it was held on an elephant's back, or on the shoulders of a giant. "This earth," said Thales, "is a great ball swinging in mid-air. The moon, too, is a great ball, and it receives its light from the sun just as our earth does."

He also understood something about eclipses, and could tell when they were going to come.

At one time, when two nations were going to fight against each other, Thales made use of his knowledge by telling the enemy that the gods were going to give sign of their displeasure by taking from them, in the midst of the battle, the light of the sun.

Of course, the enemy were not going to believe any such story as that from Thales. They sneered at

it and prepared for battle. The battle raged high; men were falling on either side; blood was flowing, men were dying — when lo! darkness began to creep over the field.

Thales had been right! the gods were angry. Awe-struck, the fierce soldiers gave up the battle, threw down their weapons, and, trembling with fear, gladly made terms of peace with the army of Thales.

In later days, when Christopher Columbus had to deal with the ignorant people of America, the same kind of story was repeated.

He found himself reduced to famine by the inhabitants of the country, who kept him and his companions prisoners; and being aware of the approach of the eclipse, he threatened them with bringing upon them great misfortunes, and depriving them of the light of the moon, if they did not instantly bring him provisions.

They cared little for his threats at first; but as soon as they saw the moon disappear, they ran to him with abundance of victuals, and implored pardon.

This was on the 1st of March, 1504, a date which may be tested by the modern tables of the moon, and Columbus's account proved to be correct. The eclipse was indeed recorded in other places by various observers.

Thales had two pupils who were greatly interested in astronomy. They not only eagerly listened to all that Thales could tell them, but studied into the mystery for themselves.

One of them said he believed that the stars were suns, and that the planets (those stars which change their places in relation to the other stars) had people living upon them.

The other declared he believed that the heavens were controlled by one God, and that the Grecian religion of many gods and goddesses, was all foolishness. He explained the causes of eclipses, and said they were not signs of the wrath of the gods at all.

The people were out of all patience with a man who could be so wicked as to say there were no gods and goddesses. "Why," said they, "he will bring

down the wrath of the gods on our city by such irreverence. Away with him! Away with him!" and so this wise man and all his family were driven from the city.

These two men were Anaximander and Anaxagoras. Not beautiful names to our ears, are they? Nor very easy to learn, you will say. Still I want you to know them; for they are as familiar in astronomy as George Washington and Bunker Hill are in American History.

Next came Pythagoras. He made many really important discoveries — important because they were correct; but he could not prove they were true, and so they were unnoticed by the scholars of the time.

Among the incorrect theories he sets forth is this: that the planets are set at regular intervals as are tones of the musical scale; and that these planets, therefore, move along in harmony, making the "music of the spheres," as he called it. This heavenly music, however, could only be heard by the gods — the ear of man being far too coarse to catch such fine sounds.

THE PTOLEMAIC SYSTEM; THE COPERNICAN SYSTEM AND KEPLER'S LAWS.

Keep up your courage, little folks. These are the only hard words I am going to ask you to learn for a long time.

Ptolemaic System.

Ptolemy, the originator of the "Ptolemaic System," taught that all the heavenly bodies revolve around the earth — the planets, the stars, the moon and all. The paths or orbits, as we call them, of all these were perfect circles.

From the earth a long bar extended far, far out into space. Hanging from this bar, like horse-chestnuts on a string, were the planets. The sun, they thought, was attached close to the bar, but the planets were dangling.

This bar then swung round and round the earth like a great weather vane. The sun being attached close upon the bar, kept steadily in its place always;

but the planets dangling by their strings were kept dancing about in most irregular directions. In this way they accounted for the fact that planets do not seem to follow round and round in order as the stars do.

A comical system indeed, and a clumsy one, too. It is said that when a certain king heard of this wonderful system he cried, "It can't be true! or if it is, it is very clumsy. Had I been present at the creation, I could have arranged the heavenly bodies better myself."

The Copernican System was not quite so bad. Copernicus taught that it was not about the earth that everything was revolving; but rather, that everything, earth included, was revolving around the sun.

"It is," said Copernicus, "as when we are riding rapidly. We think almost that the trees and the buildings are flying past us, when really it is ourselves that are flying past the trees and the buildings.

"So with our earth and the heavenly bodies. Instead of all the stars and planets revolving around

this earth of ours, it is the earth itself that is turning around on its own axis and so making it seem to us here, on the earth, that the stars and planets are flying past."

Although Copernicus discovered this great truth, he still clung to the old idea that all the bodies moved in circles. For thirty years this astronomer worked, trying to make his reckonings "come out even" with the movements of the stars. But it was like a problem in long division where one little mistake had been in the beginning. Work as long as he might, it would never come right.

The trouble was the heavenly bodies were n't traveling in circles at all; and so when Copernicus drew his charts and planned when one planet in its circular path should reach a certain place — behold, the planet would get there long before he expected it, or it would come lagging in too late.

But Copernicus was a wise man and a persevering man. He went through his problems over and over again for years. He did n't sulk and blame the planets

for not coming in with the right answer, but said bravely enough, "I have made a mistake somewhere. I can't find the mistake, but I shall by and by."

And had he lived there is no doubt he would have discovered it. Certainly he deserved to.

After Copernicus died a Danish astronomer took up the work where the brave old Copernicus had left it. "I think Ptolemy was right about the earth's being the centre around which every other body revolves," said he; "but I believe nothing in his bars and cranks. Let us see, Kepler," said he to his pupil, "how can we account for the movements of the planets."

So, for years the Danish astronomer and his faithful pupil worked on; but for all his industry this teacher, too, died without having made any discovery that should help the world in knowledge of the heavens.

But Kepler himself during all these years had had theories of his own. He had seen the mistakes in his old teacher's work, and had all the time been secretly at work for himself.

Rejecting the Ptolemaic theory entirely, he came back to the idea which Copernicus had held — that the sun was the centre. "But," said he, "I more than half believe the trouble has been in trying to reckon the movements of these heavenly bodies in circles."

Over and over he tried his problems, just as in long division sometimes you will try figure after figure. But no matter what figure he tried, the answer would never agree with the planet.

"I am convinced," said Kepler, at last, "that the planets do not move in circles at all. I half believe they move in ellipses; and that the sun is in the centre of the ellipse. I will try the ellipse."

Again for a whole year Kepler watched the planets in their course; but, alas, his reckonings came out in the end as badly as ever. This was discouraging indeed. He had felt so sure that at last he was on the right track.

Again he set to work, reckoning with the sun at one of the foci of the ellipse. Another year was spent in reckoning the planets, on an elliptical diagram.

The year was nearly at an end. No mistake had been discovered yet. So far Kepler's reckonings had agreed exactly with the actual movements. Would they agree to the very end? After seventeen years of hard work, and almost useless work, so it seemed to Kepler, was he to be rewarded at last?

Yes; in very truth he was to solve the problem which for years had puzzled and thwarted astronomers the world over. The year was finished! the truth discovered! The planets do move in ellipses, the sun being at one foci!

This was Kepler's first great law. Now there was encouragement to work indeed. One great underlying law had been discovered. He had proved it and he knew it was right.

And now after months more of hard work two more laws were discovered by Kepler. When the moment came, bringing him proof that the truth of the third was brought to light, this great man bowed his head and said, "I have nothing more to live for. The book is written. It may be read now or in the years

to come; I care not which. It well may wait a century for a reader, since God has waited six thousand years for an observer."

But is n't it odd, children, that even Kepler, wise as he was, full of such depth and reasoning, even he believed in the "music of the spheres?" He taught that Saturn and Jupiter sang the bass, Mars the tenor, Earth and Venus the alto, and Mercury the soprano.

There was one other quite noted astronomer at about this time, Tycho Brahe, who wrote a little book with a very long title, setting forth his ideas of astronomy. Little faith did this writer put either in Ptolemy or Copernicus.

"As to Ptolemy," he says in the little book, "his system is absurd. It is out of all nature; moreover it is by far too complicated.

"Then as to Copernicus," he goes on to say, "his theory, if not as absurd, surely is as impossible as that of Ptolemy. This heavy mass of earth, so little fit for motion, could not be displaced in this manner, and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TYCHO BRAHE.

moved in three ways, like the celestial bodies, without a shock to the principles of physics.

"Besides, it is opposed to scripture! I think then," he adds, "that we must decidedly and without doubt place the earth immovable in the centre of the world, according to the belief of the ancients and the testimony of Scripture.

"In my opinion the celestial motions are arranged in such a way that the moon, and the sphere of the fixed stars, which incloses all, have the sun for their orbit and accompany it in its annual motion round the earth."

"More than this," says Tycho Brahe in another page of his wise little book, "the earth is far too heavy to move about in this manner; and as to the idea of its turning over and over as some would have us believe it does, it is plain that if that were so, we should one half of the time be standing upon our heads. Surely such things could not be."

You see astronomers in those days had not learned that the sun is 340,000 times heavier than this little

earth which Tycho Brahe was so sure was far too heavy to be moved; neither had they yet learned about the law of gravitation, which keeps us all right in our relation to the earth we stand upon, no matter whether we are on the "upper side," or on the "under side."

Soon as the evening shades prevail
The moon takes up the wondrous tale,
And nightly to the listening earth
Repeats the story of her birth;
Whilst all the stars that round her burn,
And all the planets in their turn,
Confirm the tidings as they roll,
And spread the truth from pole to pole.

GALILEO.

Living at the same time with Kepler was the great teacher Galileo. He was a wise man and a great scholar. He had been educated, however, in the theories of Ptolemy and had never thought to doubt them.

At last an astronomer who had been educated in the theories of Copernicus chanced to come to the city where Galileo lived. From him Galileo learned this simpler, more sensible theory. Always ready to be taught, great teacher though he was himself, he seized these new ideas eagerly and taught them to his own pupils.

At about the same time he learned that a certain optician in Holland had invented an instrument by which distant objects seemed to be brought near the eye.

And right here, before we go on, I want you to know just how the discovery of the instrument

came about, for it was all due to the curiosity of one little boy — and you know some people sneer at children's curiosity and say it is all very foolish.

But here was a time when that same child-curiosity proved of great use and benefit to the whole world.

The optician had several little children, who, like all little children, thought there was no greater happiness than to play about their father's bench while he was at work.

It was great fun to play with the little smooth, concave glasses that their father used in his work; to look through them, to hold them so that the sun would shine through them as through a sun-glass; and sometimes when the glass was held just right, such pretty colors — like rainbows — would fall upon the bench.

But one day, when the optician's little boy was at play with two of the glasses, he chanced to hold them in such a way that the face of the great cathedral clock, away out upon a distant square of the city, seemed to be very near.

For an instant the boy was startled. He stared

hard at the clock and then at the glasses. He winked his eyes hard. But there was the clock so far away that the hands could hardly be seen — just as it had always been, ever since the child could remember.

"But it looked near — so near I could see the numbers on the face," said the boy to himself. "The glasses did it — it must have been the glasses."

Then of course, boy-fashion, he set to work to think it out. He sat down upon the steps to think. He turned the glasses over and over. He looked through first one, then the other — but the clock would not come near again.

"Strange," thought the boy, "I wonder" — but see! there's the clock again — close by — staring straight into the boy's face. "O, I know! I know!" cried the lad, "it is the way I hold them — the two together — father! father!" screamed he, and the good old Dutchman came hurrying to the door to learn of his son's wonderful discovery.

This then was the way it came about that people learned that putting a concave and a convex glass

THE DISCOVERY OF THE TELESCOPE.

together in the right position would make distant objects seem near.

It was a great and an important discovery; without it we should never have had the telescope, and without the telescope it is very little we should ever have learned about the stars or the sun or the moon.

"If only the planets could be made to seem near," thought Galileo, when he heard of this discovery in Holland, "what wonders they might show to us."

Galileo then set to work to make something like that which the optician had made.

After much labor he produced an instrument which magnified thirty times. This was the first telescope! Rough as it was — only a lead pipe with glasses in the end — it did more to throw over the foolish notions of the astronomers than years of study could have done.

With this telescope, Galileo examined the moon. After all these years of guessing and guessing, here was a little glass that showed the moon so plainly that Galileo could see even its mountains and valleys.

Next he turned his glass toward the planet Jupiter. Close to it he saw three little stars, as he supposed they were, which were not visible at all to the naked eye. Here was something new! what could they be?

He could hardly wait for the following night to come that he might watch them again. Eagerly he turned his telescope upon Jupiter a second night. Another wonder! the little stars had changed their places! the next night they had changed more! the next night more still! and now another, a fourth star, appears!

At last Galileo knew beyond a doubt that these were four small planets running round and round Jupiter, while Jupiter was making his journey around the sun.

Here was a little Copernican system hanging in the sky for all to see.

Galileo, full of enthusiasm, told of his new discoveries, and invited his friends to come and look for themselves. He received, however, little else but scorn

and ridicule. Many refused to look through the glass even, lest they should become bewitched.

Some said it was wicked to be digging out valleys on the fair face of the moon. Others said that there were only seven planets because there were seven metals and seven days in the week; and that it was absurd to say there were more than seven; it did not occur to these people that their own reasoning was a thousand times more absurd than anything Galileo had said.

But now that the telescope was invented and people could *see* what were in the heavens, all these absurd old notions gradually died away.

Knowledge of the sky grew very fast. Every year the telescope was improved and strengthened, and no longer was there any need for guess work. Astronomy began now to be a real science — that is, something that is actually true, based on real laws, everlasting and unchanging.

SOME OLD TIME MAPS.

But just here, before we leave these early astronomers and their strange ideas, here are some pictures of the earth as the ancient people believed it to be, which must amuse and interest you boys and girls, who, young though you are, have already, I have no doubt, learned in your geography all about the earth, its motions, its shape, and its position in air.

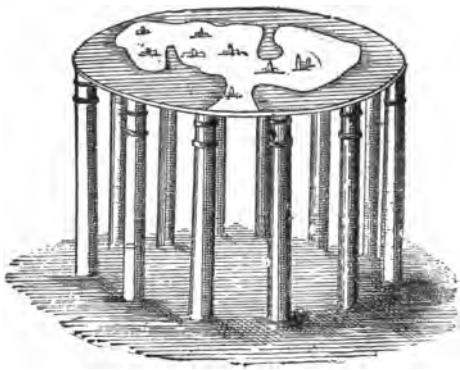
But there was a time, as you have already seen, when neither boys nor girls, grown men nor women, knew anything whatever of all these things that we are so sure of to-day.

The early Chinese, for example, used always to speak of their country as being the very centre of the most central spot upon the earth.

Their maps showed the earth to be one great, flat disc, China in the centre, and all around the disc a marvelous, mysterious, inaccessible ocean.

Away off at the edges of the disc — far from

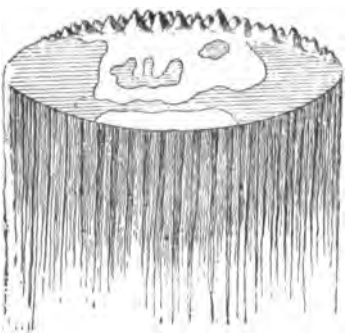
China — were imaginary countries inhabited by pygmies and giants. The great bell-shaped sky, they believed was supported by great columns. "Of course there must be columns," they reasoned; "surely the sky could not hold itself up with no support."



THE EARTH OF THE VEDIC PRIESTS.

The Vedic priests taught that these columns could be held in place only through the sacrifice to the gods — and that if these sacrifices were neglected, the people might well expect that the gods, angry at such lack of attention and reverence, would break these columns and let the great sky come tumbling down upon the wicked people's heads.

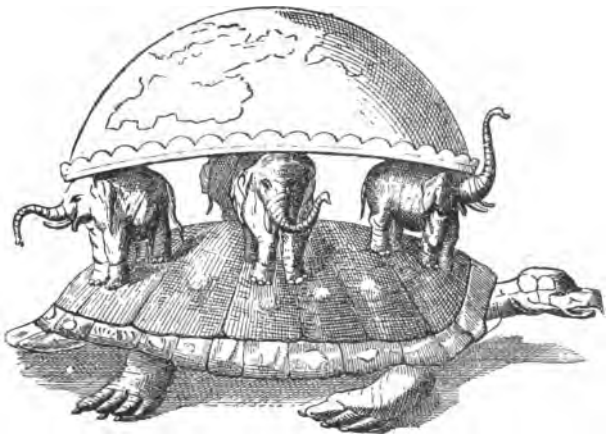
In some countries it was believed that the earth floated on the great ocean, a great disc, just as the lily pad floats on the surface of the pond. To keep the earth in place there were long, long roots reaching down, down, nobody knows how far into the water.



THE EARTH WITH ROOTS.

The Hindoos taught that the earth was a great hemisphere resting upon the backs of four great elephants, and that these elephants stood upon the back of an enormous tortoise.

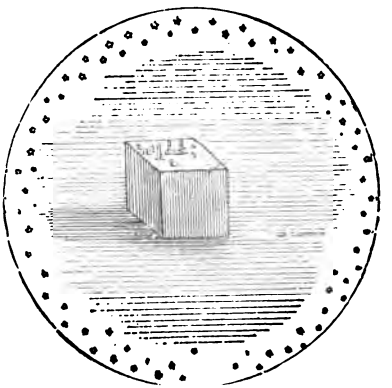
This Hindoo idea, however, may not be so very absurd as it seems after all. For many of the Hindoo teachings were not meant to be taken literally, but symbolically.



HINDOO EARTH.

So it may be in this instance, that the writers of the old books in which this was taught, really meant the four elephants to symbolize the four directions of the compass; and as regards the tortoise, it is well-known that the tortoise was often used to symbolize strength, endurance, eternity.

There was another great writer in these early times — Plato — who was much inclined to think and to teach that the earth was cube-shaped.



PLATO'S CUBICAL EARTH.

Still another writer argued that the earth was a great mountain; that people lived only on its top; that its great wide-spreading base was down, down — nobody knew exactly where, but down far enough away to be beyond the reach of man — down in some region known only to the gods.

It was because of all these beliefs that when thinkers and scholarly men like Columbus began to teach that the earth was, as we now know it to be,

a great, solid ball suspended in space,— it was because of these old beliefs that it took so long to convince people of the truth.

If you have read a life of Columbus, you have no doubt read of how the people sneered at him, called him a fool, said he was crazy, and how they threatened to put him in prison, burn out his eyes, kill him — "Any way," said the people, "to get such an insane teacher out of our midst."

"Why, he will upset all our teaching!" cried the old monks who taught the youths.

"He will bring down the wrath of the gods," said some who still believed in the old Greek religion of many gods.

"He is going contrary to the teaching of the Bible," said others who believed in the Bible.

"What a fool he is," said others, "to suppose that he can sail around this earth! Why, the earth is flat; and when he reaches the edge of the ocean, he will sail over into nothing."

"Suppose the earth is round," said others; "when

he had sailed down one side of the ball, how could he expect to sail up-hill on the other side?"

"How can the people on the earth stick upon the earth with their heads down and feet up?" said others.

And so the people talked; but after a long, long time, all these old ideas went down before the proofs that were brought of the real shape of the earth.

And to-day, everybody in the civilized world, and many in those parts of the world that are not civilized, know the truth of the earth's shape, and laugh at the ideas of the early people quite as loudly as they in their day laughed at these ideas of ours.

PHASES OF THE MOON.

THE MOON.

So much for the "early history of astronomy," as the big books say. Now let us read about the phenomena of the sky, just as you and I see it. There are stars, and planets, and comets sometimes,— the biggest and brightest of all, seemingly, is the moon itself.

The moon is a great, round planet like our own earth. It is hard and solid — not a mass of burning, blazing metal like the sun and the stars.

And once, perhaps there were trees and flowers and grass there, and men and women and children. Indeed, all these may be there now; but it is hardly likely; for the great telescopes that are made in these days are so clear and strong that if there were any left on the moon, we should be quite sure to find it out.

THE FULL MOON.

Of course you have often traced out the face in the moon — you did that when you were a very, very little child, I am sure; and you were told it was a face — a truly face?

Ah, yes, mammas and nurses always tell that to very little children. It is one of those fibs — like the story of Santa Claus — that are quite forgivable because so pleasant to listen to and so very agreeable to believe for a time.

But now, little men and women that you are, you are quite ready to learn the plain, dry truth of that face, which is simply this; the dark spots that make the eyes and nose and mouth of our make-believe face, are really great hollow places on the moon's surface, valleys between mountains perhaps, or the beds of old lakes of fire, or the craters of old, burnt-out volcanoes.

But what makes the moon have such different shapes? Sometimes it is like a whole ball and sometimes like a very small bit of a ball.

This is because the Sun, Earth, and Moon are all flying around in circles, or rather in ellipses.

Just how it happens that the moon seems to take on these different shapes, I once heard a teacher explain to her children in this way. She said:

"John is the big sun, and Frankie the little earth. Frankie will face the sun and will keep his eyes up over the sun's head. Now this disk which I hold in my hand will be the moon. Watch it. Now I carry it around back of Frankie away down towards the floor. He can't see it, so he says, 'We have no moon.' Frankie must keep his eyes up all the time.

"Now I carry the disk around to Frankie's side, low down. Still he can't see it. Now I carry it higher and higher up towards John's head. Now Frankie can see it. But if it were the real moon and John were the real sun he could n't see it yet. It would be lost in the sun's very, very, very bright rays.

"We'll hide this disk as it crosses John, in his blouse or his tie, or under his arms, just as the moon gets hidden in the rays of the sun. Now the disk is getting out of these bright rays, up above the sun. Now it is on a level with Frankie's eyes. He sees

just one edge of it. He sees what we call 'The New Moon.'

"It comes out more and more from the sun, 'nearer Frankie, showing more of itself step by step, until at last he sees The Full Moon.

"But now it keeps on towards Frankie until it has moved past the line of his eyes and he begins to see that a small part of it is gone.

"Now it grows steadily smaller and smaller, rising later and later every night, until at last you would have to be awake in the morning to see it at all; and even then there would be very little of it left to see. And at last it is gone entirely, off behind Frankie, you see, as it was when we started. Now he cannot see it at all, and he says again that we have no moon."

Now and then we hear of an "eclipse of the moon." Did you ever see an eclipse, I wonder? — a shutting off of the light of the moon?

First there appears a little line or spot of darkness on the edge of the moon. The black spot grows larger and larger, seeming to spread — if it is a "total

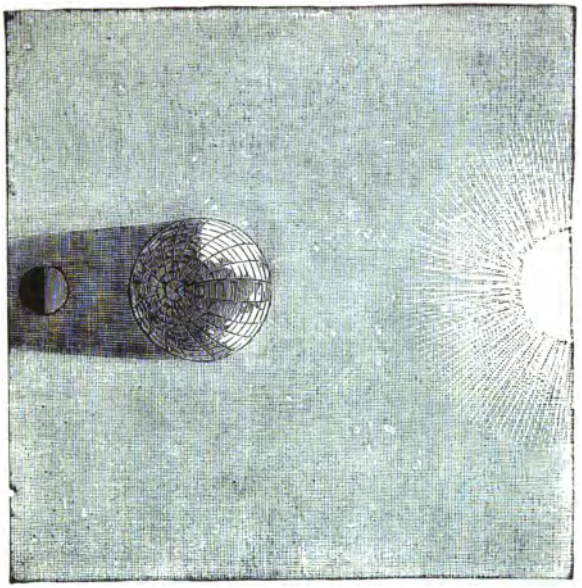
eclipse"— over the whole face of the moon. Then very slowly it passes off at the opposite edge from which it came on, leaving the moon as clear and bright as ever.

Astronomers can reckon, knowing, as they do, the relative positions of the sun, and the earth, and the moon, just when these eclipses are to come. You remember in the first part of the book you read of a general who won a battle through prophesying the coming of an eclipse. There are many such stories told in history.

Now these eclipses are brought about in this wise:

The earth and the moon, you will not forget, have no light of their own — only the light reflected to them from the sun.

Once in a while these three globes, the Sun, the Earth, and the Moon, get in each other's light, just as you sometimes in the evening get in mamma's light. You are moving about, mamma is moving about, and you very likely get between the lamp and mamma, or between the lamp and papa's newspaper.



ECLIPSE OF THE MOON.

Now when the earth and the moon get in between each other and the light of the sun, one or the other of them gets eclipsed. Try it this evening for yourselves. A lamp for the sun, and two balls for the earth and moon. Put the two balls in a line with the lamp, and you'll see an eclipse. That is, the middle ball will shut off the lamp-light, and will throw its own shadow on the outside ball.

THE SILVER BOAT.

There is a boat upon the sea;
It never stops for you or me.
The sea is blue, the boat is white,
It sails through winter and summer night.

The swarthy child in India's land
Points to the prow with eager hand;
The little Lapland babies cry
For the silver boat a-sailing by.

It fears no gale, it fears no wreck,
It never meets a change or check,
Through weather fair, or weather wild —
The oldest saw it when a child.

Upon another sea below,
Full many vessels come and go;
Upon the swaying, swinging tide
Into the distant worlds they ride.

And strange to say, the sea below,
Where countless vessels come and go,
Obeys the little boat on high
Through all the centuries sailing by.

MRS. M. F. BUTTS.

A TRIP ROUND THE EARTH.

THE COLORS OF THE STARS.

Now as to the colors of the stars. You say some are red, some blue, and some white. That is very true. And it is the most wonderful thing how astronomers have learned why these stars burn with such different colors.

You all know the primary colors, and you remember the prism-shaped glass we had at school one day, through which we let the sun shine. You remember it made what you called a rainbow, that is, it showed the primary colors on the white wall, arranged just as they are in the rainbow.

Well, the astronomers have some sort of an instrument made up of a prism and a telescope, by which they can catch the rays of the stars, just as we caught the rays of the sun. They have found, by means of this instrument, that different metals and gases when burning make different colored bands.

For example, iron, white-hot, will make a band

just like that we get from the sun; therefore they suppose the sun must be mostly white-hot iron burning. Sodium, when burning, will make, besides the rainbow colors, two other yellow lines; therefore, when they catch a star's rays which make that sort of a band, they know that star must be burning sodium. Strontium, burning, will give a red line, and silver, burning, will give two green lines.

You see each one has a different colored light. Fire-works are made of all these different things; and that is how it happens that you get so many and such beautiful colored rockets. The first rocket shot out will perhaps be made of sodium, the next perhaps of barium, the next perhaps of magnesium, the next of strontium.

A DISAPPOINTMENT.

Across the blue sky together
Raced three little clouds one day;
The sun they had passed at noontime,
The west was a league away.
"Oh, he is so slow," they whispered,
"So slow and so far behind!
We three can be first at sunset,
If only we have a mind."

They laughed to themselves in triumph,
They took hold of hands and flew —
But ah! what a sad disappointment
They afterward found and knew;
For this they had quite forgotten,
As they hurried along through the air,
There never can be any sunset,
Till the sun himself is there.

— KELLOGG.

WHY THE STARS TWINKLE.

Would you like to prove to yourself why the stars twinkle? I could tell you, I suppose, in a very few words, but I doubt if you would understand. Let us prove it for ourselves; then we shall remember it "forever and a day." Here is a lamp which will, I think, solve the mystery for you.

Before I light it, I want you to look carefully at this bit of gilt paper I have fastened here on the blackboard just a little higher than the top of this lamp-chimney. You do not see anything unusual about it. There is nothing between you and it but the air. The air is quiet, therefore you do not see it at all.

But we must light our lamp and move it up close — quite close to the paper. Now watch! do you not see the paper seems to sparkle and shake and—yes — it seems to twinkle! And still you know the paper really has not moved at all.

Now you have the secret! The stars, which are

points of light, seem to us to twinkle simply because we look at them through strata of cold air and strata of warmer air — air in motion. The greater the contrast between the different strata the greater the apparent twinkling.

And now we know why on biting, frosty, winter nights the stars seem to shine and blaze and twinkle so much more than on the soft, warm nights of summer.

MY STAR.

All that I know.
Of a certain star
Is, it can throw
(Like the angled spar)
Now a dart of red,
Now a dart of blue;
Till my friends have said
They would fain see, too,

My star that dartles the red and the blue!
Then it stops like a bird; like a flower hangs furled;
They must solace themselves with the Saturn above it.
What matter to me if their star is a world?
Mine has opened its soul to me; therefore I love it.

"SHOOTING STARS."

Children like to watch for "shooting stars," and they often think they are stars flying about. This is not so. The stars keep their own places, century in and century out, only rising and setting, as we call it, like the sun and moon.

So these "shooting stars," as we call them, are not stars at all. Only masses of fiery metal or gas, thousands of which are said to be flying about in the air high above us, much as the sparks fly off and around a grind-stone.

Two or three times in the world's history there have been so many of them visible in the sky at once, that it has seemed as if the heavens were on fire. People were frightened half out of their senses, fearing that the world was going to burn up. But astronomers have studied these "shooting stars" and have found that they are quite harmless.

Once in a while one gets so near our sphere that

SHOWER OF SHOOTING STARS.

gravitation pulls it downward, so that it really strikes our earth with such force that it is driven away down into the ground. When these meteors, as they are often called, are dug out from the ground, it is always found that they are made up of metals just like those in the stars.

These metals, which were liquid fire while they were shooting about overheard, have been cooled as they came down through our air, so that by the time they reached the earth they were solid masses of metal.

The spacious firmament on high,
With all the blue ethereal sky,
And spangled Heavens, a shining frame,
Their great Original proclaim.
The unwearied sun, from day to day,
Does his Creator's power display,
And publishes to every land
The work of an Almighty hand.

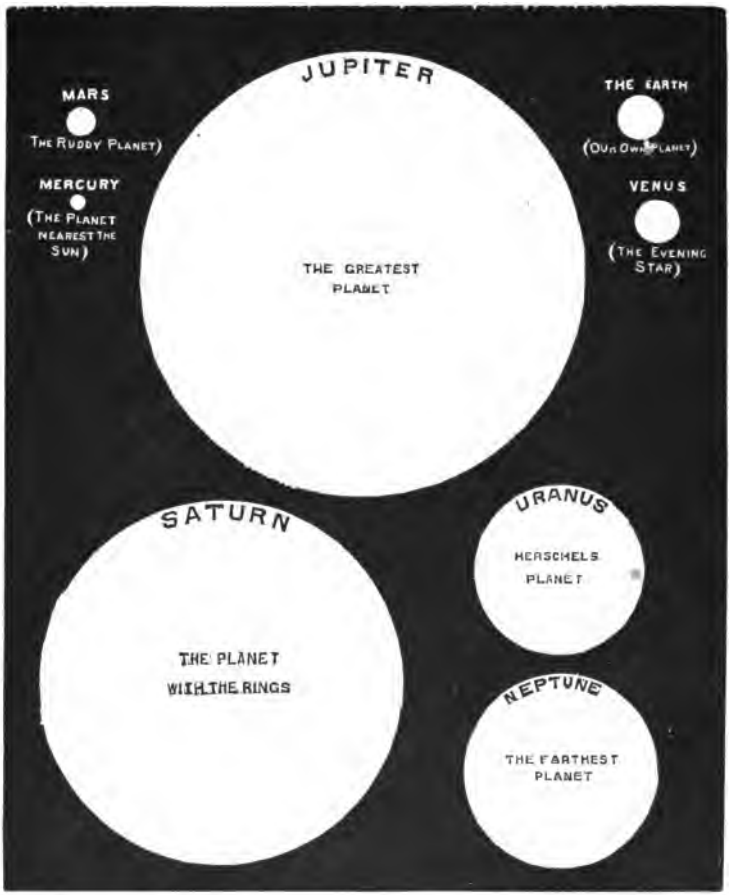
PLANETS.

But some of the very largest of the stars do not twinkle at all, you will say.

Yes; but the truth is, these bodies, large as they are, that do not twinkle, are not stars at all,— they are planets. A star is a mass of burning matter, like a red-hot coal, for example. A planet was once a burning mass of matter like a red-hot coal, but is now like a piece of coal, all burned out, cold and gray.

Our earth was once a star; but when it came to be all burned out, and had grown cool and solid, then it was fit to be a home for men and women and children. Then the rivers formed, the trees and the grasses grew, and after a long time people came to live upon it.

And so all these other planets,— the stars that don't twinkle, as you call them — are like our earth, solid and cool, and having upon them, perhaps, for all you and I know, trees and grass and rivers.



COMPARATIVE SIZES OF THE PLANETS.

Indeed, how do you know but there may be, away off on that big, bright planet which we call the "evening star," little boys and girls just like you. Perhaps they may be looking across at our earth this minute, wondering what it is, and if there are any people upon it — little boys and girls like themselves.

But if our earth and these other planets are cold and solid like a burnt-out coal, what makes them shine at all? A dead coal does n't shine.

Well, let's see. When you have been out playing, at sunset, did you ever the the sun shining upon the windows of the houses upon the hill, so red and bright that it seemed as if they must be on fire? That's just the way with the moon and the other planets.

Although we are in the shadow ourselves at the time, yet they, like the windows on the hill, are so far above us that the sun shines full upon them, and we think they are fires themselves.

There are not many that we know of. Our Earth is one, and a very important one to us; though perhaps the little — may be — boys and girls away off on the

"evening star" think it would make no difference if it were to drop out of sight this minute.

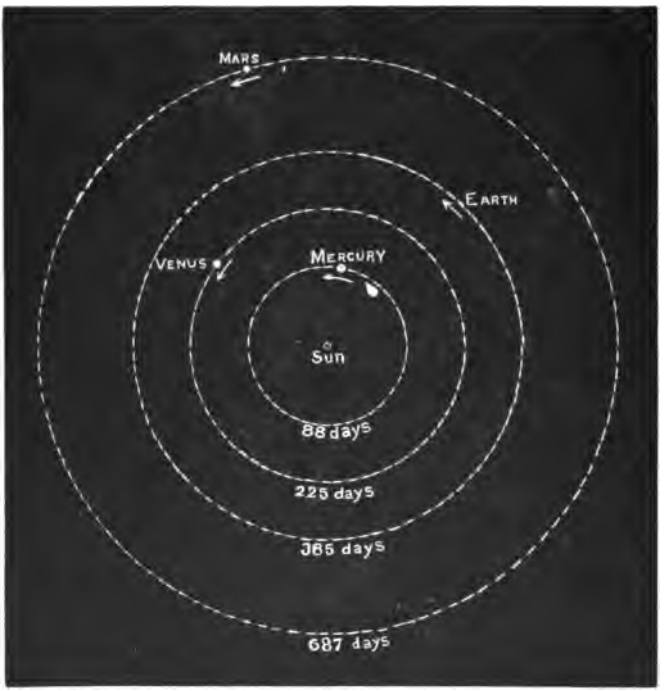
Then the Moon is another. That is important to us, because when it gets lighted like the windows on the hill from the sun, it reflects its light to us, and we say, "What a beautiful moonlight night!"

Then there is Venus, the one which so much of the time shines as the evening star; although you know now it is not a star at all. Then there is Mars, the red planet, sometimes called the planet of war. There is Mercury, the one which keeps so close to the sun, losing itself in the dazzle of it, that we can't often see it.

There is Saturn, a planet which, when seen through the telescope, seems always to have great rings of fire around it. There is Jupiter, the planet which the ancient people used to fear. They believed the lightning and the thunder bolts came from it. Then there is another, Neptune, the one farthest from the sun of any we know.

Just here I shall have to tell you that a

year is the time it takes a planet to go around the sun. It takes us 365 1-4 days to go around; therefore we say a year is 365 1-4 days. But if we lived on Mercury,



THE ORBITS OF THE FOUR INNER PLANETS.

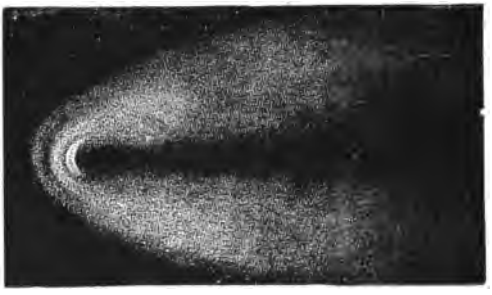
which is very close to the sun, and so has only a small circle to make, we should find that summer and winter would follow each other so fast that mamma could

hardly get your clothes ready from one season to the other — especially if she had a very large family of little folks. For a year on Mercury is only 88 days.

So you see, if you had happened to be born on Mercury you would be quite a good many years old to-day; but if you lived on Neptune, though you grew old and bent and gray-headed, still you would not even then be one year old.

Tell me, ye splendid orbs, as, from your throne,
Ye mark the rolling provinces that own
Your sway — What beings fill those bright abodes?
How formed, how gifted? What their powers, their state,
Their happiness, their wisdom? Do they bear
The stamp of human nature? Or has God
Peopled those purer realms with lovelier forms
And more celestial minds?

— WARE.



A COMET.

COMETS.

Comets are rare visitors in the star world. One does n't see very many of these fiery visitors in his life-time — and never the same one twice.

Although a grand-looking object, appearing in the heavens, as it does, without any seeming excuse for itself, with never so much as a " by-your-leave " to the starry families through whose early estates it sweeps its bright and shiny length, it is, after all, a very unsubstantial thing. Indeed, it is nothing but a great mass of the very thinnest gas.

There was a time when people were frightened for their lives when a comet appeared in the sky. " Surely "

they would cry, "it is a sign from the gods." And away they would hurry to the temples and pray and offer sacrifices as fast as ever they could, hoping to turn aside the terrible judgment, whatever it might be, that the comet came to foretell.

And even later than this, long after the people had given up their belief in many gods and goddesses, there were people who feared the appearance of the comet.

"Some terrible disaster always follows," they would say, shaking their heads wisely.

The astrologers, especially, believed the comets to be signals of some terror to come.

In 1472, there appeared a large comet — "very horrible, truly alarming," so historians say. It threw its rays from east to west, lighting up the whole sky with a strange lurid glare.

In 1527, another comet appeared — "blood-red and frightful to behold," so the books of the time report. "Many people, scared at this terrible ball of fire, fell sick and died. It had a tail of enormous

length, and at its head was plainly to be seen an arm, upraised, and holding in its hand a sword, the tip of which was a star. And on the sides of the comet were axes and hatchets and bloody swords."

A terrible comet, indeed, was it not? But books in those times were full of superstitions, as you already have learned.

In 1577, was another wonderful comet (so the same book says) this one having a head like an owl followed by a long trail of scattered light ending in sharp, sword-like points.

"The comet," says the book, "is always a forewarning of great evil.

"Whenever eclipses of the sun or moon, or comets, or earthquakes, conversions of water into blood, and such like prodigies happen, it has always been known that very soon after these miserable portents afflictions, effusions of human blood, massacres, deaths of great monarchs, kings, princes, and rulers, seditions, treacheries, raids, overthrowings of empires, kingdoms, or villages; hunger and scarcity of provisions, burning

and overthrowing of towns; pestilences, widespread mortality, both of beasts and men; in fact, all sorts of evils and misfortunes took place.

"Nor can it be doubted that all these signs and prodigies give warning that the end of the world is to come, and with it the terrible last judgment of God."

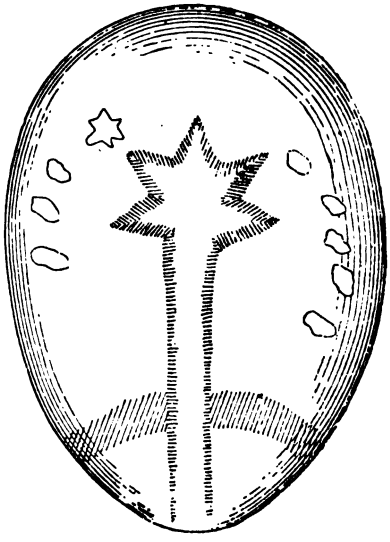
In 1680, Europe was convulsed with a comet fright again. The terror this comet produced was indeed great.

People made their wills, some destroyed their houses, saying, "Surely the end of the world is come!" Though what advantage it was going to be to have made their wills or to have destroyed their houses, I am sure no one knows. But when people are frightened they are not always as reasonable as they might be.

At the time of this fright, it was told that at Rome a hen had laid an egg upon which was distinctly marked a picture of a comet. Wonderful, wasn't it? Perhaps the hen was trying to vie with the geese who by their cackling saved Rome so long, long ago.

But by and by, came an astrologer — Halley — who

proved that the comets are nothing but great masses of gas, circulating, like the planets, around the sun, appearing at regular intervals, as any regular circulating body might be expected to appear.



THE COMET-PICTURE ON THE EGG.

This, of course, destroyed the old superstition that they came as warnings of some evils to come; but not many years had passed before a new fright seized upon the people.

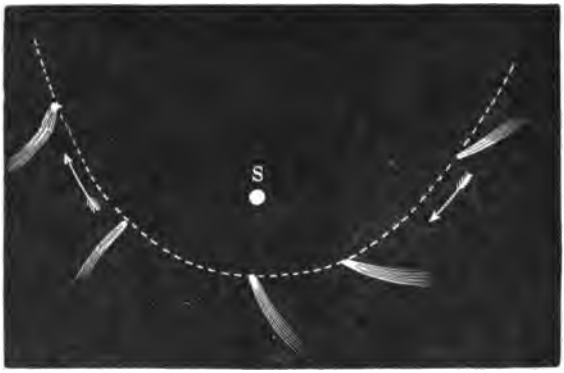
"Suppose this great circulating body should come in contact with the earth! What then would happen? Should we be ground to powder by the collision, or should we burn, or should we be carried along, caught in the trail of the great fiery serpent?"

A Frenchman — Lalande — put these fears into the minds of the people, so it is said, by a paper which he was to have read before the Academy of Sciences in Paris. The subject was "How the Earth might be destroyed by contact with a Comet."

For some reason, when the day came, Lalande was unable to read the paper. The title of his paper, however, had been published in the papers, and the people, knowing nothing but the title, began to wonder and imagine until all Paris was in a fever of excitement.

The house of M. Lalande was filled with those who came to question him. Finally, M. Lalande, finding it impossible to answer all the questions put to him about his fatal paper, and wishing to prevent the real evils that might arise from the frightened imaginations of the

weak, caused it to be printed, and made it as clear as was possible.

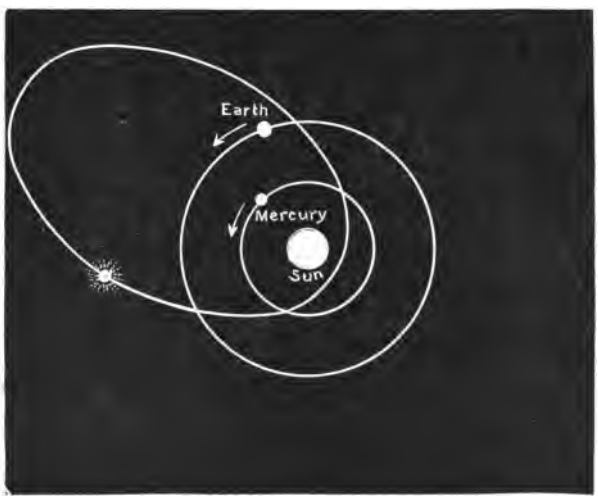


COURSE OF COMET ROUND THE SUN.

When it appeared, it was found that he stated that of the sixty comets known there were only eight which could, by coming too near the earth, say within 40,000 miles, occasion such a pressure that the sea would leave its bed and cover part of the globe, but that even if this could happen, it could not occur for many years.

Naturally the excitement gradually died away, no great harm was done, and Lalande found himself most unexpectedly an astronomer of world-wide reputation.

Are you not glad, however, amusing as all this may be to read about, that we live in a time when such superstitious fears do not govern; that we know that eclipses come merely from the changing relative positions of the planets; that shooting stars are mere masses of melted metal; and that comets are, least of all, merely the most harmless, powerless masses of very thin gas?



ORBIT OF ENCKE'S COMET.

PICTURES IN THE SKY.

THE GREAT BEAR.

PICTURES IN THE SKY.

All that you have read about the moon, and the comets, the color of the stars, and why they twinkle, has been real fact — real scientific fact. Now we will close our astronomy lessons with the stories of the constellations.

Possibly you may have thought sometimes that these scientific facts were rather dry and uninteresting. If they were so, and you have had the courage to read them through and not "skip," why certainly it is time you were rewarded by something less scientific and dry.

And what is it that children always expect to be rewarded with by their teachers after these seasons of hard study? Why stories, of course,— real fairy stories, or at least stories of wonderful adventures and thrilling incident.

Now would you believe it? — just such a reward awaits you even in this land of science. Even in Astronomy there are stories to be told, stories to be listened to.

It is a large, large picture-book that good Mother Nature has spread out for her children up there in the sky! And best of all, every picture has its story. And such stories! As good as any fairy stories that ever you read. See if they are not. Let us begin with those pictures closest around the "pole star."

The five circumpolar constellations, as they are called, are The Great Bear, The Little Bear, Cassiopeia, Cepheus, and The Dragon.

And first of all let us begin with the stories of Ursa Major and Ursa Minor, or, in plain English, The Great Bear and the Little Bear.

ZEUS, OR JUPITER. (*In Art.*)

THE GREAT BEAR.

To the old Greeks the heavens were a long, long story-book. These Greeks believed in a great many gods and goddesses, and had all sorts of wonderful stories about them. Is it any wonder, then, that as the shepherds lay on the hillsides at night, looking up into the beautiful sky, they would imagine that they could see their gods and goddesses sometimes among the stars?

This story of the two bears will give you an idea of the wonderful stories these early people could tell, and of the ingenious way they could fit their stories to the star-pictures.

One night as some shepherds were watching the skies, one of them said, "I see two bears in the sky!"

"It must be the beautiful sea-nymph and her son!" said another.

"What sea-nymph, my father?" asked a little shepherd boy. Then the shepherds sat down; and as they watched the bear, they told this story to the little boy:

"Once, long, long ago, Jupiter fell in love with a beautiful sea-nymph. Very likely he would have begged old Neptune, the god of the sea, to allow her to be carried up to his home on Mount Olympus, but Juno, Jupiter's wife, grew jealous of her, and made terrible threats.

"Jupiter, fearing Juno, had the sea-nymph and her little son changed into bears that Juno might not find them. But Juno learned what he had done,

and was determined to be even with him. Therefore she went to a certain goddess who was a mighty hunter, and persuaded her to shoot the bears.

"Jupiter was angry indeed; but all he could do was to honor the poor sea-nymph and her son by placing them in the sky."

"And these bears that we have just found," said the shepherds, "must be the bears we have been told about by our fathers before us!"

But how shall we find these bears? Hardly any child but knows the "big dipper." A straight line drawn through the pointers of this dipper and then extended five times as far it will come directly to the pole star. This pole star is the tip of the little bear's tail, or the end of the handle of the little dipper. The rest can be easily traced.

STARS.

O varying stars, when shadows fall,
I watch your splendors glimmer soft,
And wonder at what hour of all,
You shine the loveliest from aloft.

Is it when early gazers mark
Your doubtful orbs at twilight's end,
While down the mellow sapphire dark,
Steal the first timid rays you send?

Is it on languid nights that hold
The dusky earth in tranquil rest,
When all your glories wear the gold
Of buttercups in a meadow's breast?

Is it on chilly nights that wake
The katydid's harsh-throated band,
When in the breezeless gloom you make
One pale, ethereal daisy-land?

Is it when wintry gales arise,
That jar the pane and rock the spire,
And when your flashes turn the skies
To one white arch of throbbing fire?

Ah! while I watch your radiant host,
Through every change with new delight,
I know not when to love you most,
Dear, sacred mysteries of the night!

—EDGAR FAWCETT.

THE DRAGON.

Winding in and out between the two bears, are some stars arranged as are those above, the four large ones forming the head. This was believed to be a dragon. Its story is as follows:

There was once a very brave youth named Hercules. Hercules had an uncle who hated him and wished to put him out of the way. The uncle hardly

dared kill Hercules without some cause, so he planned many terrible journeys and tasks for him, thinking that in these he would certainly be slain.

It was believed in those times that away off towards the setting sun, there was a wonderful tree which bore golden apples. Many a brave youth had tried to get them, but the tree was guarded by a fierce dragon — a dragon whose fiery breath was deadly poison, and whose enchanted hide could be pierced by no arrows made by man.

This cruel old uncle, knowing this, sent Hercules to get the apples. Now it so happened, there was but one who could overcome the dragon, and that one was Atlas.

Atlas was the giant on whose shoulders the earth rests (so the Greeks believed). When Hercules came within hearing distance, Atlas said, "Come and hold up this old globe for me a little while, that I may rest my shoulders; and I'll get you the golden apples!"

Hercules gladly took the earth from the giant's

ATLAS. (*In Art.*)

shoulders, and away went Atlas. He soon returned with the golden fruit in his hand, but instead of giving it to Hercules, he walked off with it laughing.

Poor Hercules! he thought for a moment he was

a prisoner forever. But knowing that giants are as stupid as they are large, he called out, "Just come and help me fix this bearskin over my shoulders before you go!" Atlas came at once. "I can afford to do that for you at any rate," said he.

But no sooner had he come close up to Hercules, than over rolled the earth to his shoulders, and Hercules, snatching the apples, ran off with them in a twinkling.

Some stories say that Hercules himself killed the dragon, and so got the apples. At any rate this dragon in the sky was supposed to be the one that once guarded the golden apples.

CEPHEUS AND CASSIOPEIA.

CEPHEUS AND CASSIOPEIA.

Close by the Bears are the constellations Cepheus and Cassiopeia.

Cepheus and Cassiopeia were king and queen of a country in or about Greece. Cassiopeia was very beautiful and very, very vain.

Angry because the sea-nymphs were praised so much for their beauty, Cassiopeia prevailed upon Cepheus to go with her to the base of Mt. Olympus, and there they both cried out against all the gods

and goddesses, saying, "Cassiopeia is more beautiful than gods, or goddesses, or sea-nymphs. Cassiopeia's daughter, Andromeda, is also more beautiful than any nymph of all the sea!"

Jupiter, exasperated at such boldness and defiance, set them both in the sky as a terrible warning to all mortals who should dare insult their gods. There they stand, their faces turned away from Jupiter's beloved bears, lest they should harm them by even looking upon them.

The stars of most importance in these constellations are arranged in the shape of a K and a W.

THE STARS.

What do the stars do
  Up in the sky,
Higher than wind can blow
  Or the clouds fly?
Each star in its own glory
  Circles, circles still;
As it was lit to shine and set
  And do its Maker's will.

— CHRISTINA ROSETTI.

THE ZODIACAL CONSTELLATIONS.

A belt eight degrees above and eight degrees below that line in which the earth moves in its elliptical journey around the sun is called the Zodiac. In this part of the heavens, in this belt, are constellations called the "Zodiacal Constellations." There are twelve of them, and the ancients spoke of them as we now speak of January, February, March.

For example, we say, "It is January now." The ancients would say, "The world is passing along through Leo, Virgo, Libra," etc.

The Great Bear, the Little Bear, Cassiopeia, Cepheus, and the Dragon were called the Circumpolar constellations because they are so closely around the Polar star. So these constellations in the Zodiac belt are called the Zodiacal constellations.

In almanacs, especially in the "Old Farmer's Almanac," you will see these pictures with their odd little signs; and there are farmers even in these days

who believe that these different groups of stars — constellations we call them — influence the crops and the stock, the winds and the weather.

When these names were first given to these constellations there was a meaning in them. For example, when the earth passed through the Water-bearer, wet weather was sure to come, so the ancients believed; when passing through the Archer, it was time to go hunting; when passing through the Scales, the days and nights were of equal length.

Here are the Latin and the English names of the twelve parts into which the Zodiac is divided. In the sky at certain parts of the year you can see some of these groups of stars; and it will be pleasant then if you recall that they belong to the "Zodiac."

Aries, or the Ram.
Taurus, or the Bull.
Gemini, or the Twins.
Cancer, or the Crab.
Leo, or the Lion.
Virgo, or the Maiden.

Libra, or the Scales.
Scorpio, or the Scorpion.
Sagittarius, or the Archer, the Hunter.
Capricornus, or the Goat.
Aquarius, or the Water Bearer.
Pisces, or the Fishes.

Or, as the old English almanac says,

"The Ram, the Bull, the Heavenly Twins,
And next the Crab the Lion shines,
The Virgin and the Scales.
The Scorpion, Archer, and He Goat,
The Man that holds the watering-pot,
And Fish with glittering scales."

I am afraid, when you come to see these groups of stars in the sky, you will say these ancient people must have had very lively imaginations to see anything in their arrangement that could remind them of Fishes, or Goats, or Crabs. Sometimes, however, the resemblance is quite easily traced.

ANDROMEDA.

There are, here and there all over the sky, other constellations, lying neither in the circumpolar belt, nor in the Zodiacal belt, but in the space between.

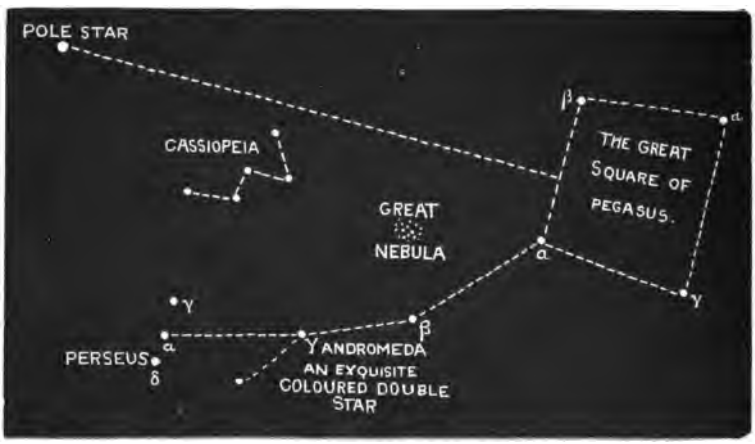
In speaking of these intermediate constellations, we may as well begin with Andromeda, named, you remember, from the daughter of Cepheus and Cassiopeia.

Just off from the lower point of the W in Cassiopeia are three stars curving upwards in this manner:

These mark the constellation Andromeda, who was the daughter of Cassiopeia. When Jupiter learned how bold Cassiopeia and Cepheus had been, he ordered that, as greater punishment still, their

beautiful daughter should be chained to a rock in mid-ocean, and that there she should be devoured by a terrible serpent. It happened, however, that she was rescued by a brave youth, of whom you shall learn soon in the story of the constellation Perseus.

The upper of those three stars (*A*) makes also one of the corners of a large square just beyond Andromeda, which marks the constellation of Pegasus, the wonderful winged horse, who, it is said, used to carry the thunder and lightning for Jupiter.



PERSEUS.

A little below and only a short distance from the constellation of Andromeda, is the constellation of Perseus.

The story of Perseus, as the Greeks, looking up at the evening stars, used to tell it to their little children, is a very wonderful tale.

The strange adventures of Perseus began when he was a very little baby — only a few weeks old.

At that time a cruel enemy imprisoned the child and his own beautiful mother in a chest, and set them adrift out upon the sea. It was hoped they would be drowned; but the gods had great things in store for this child Perseus, and it came about that the chest was found and floated to the shore by a good fisherman who rescued and kindly cared for the mother and her baby.

The king of the island was a cruel tyrant, and having taken a jealous dislike to Perseus as he grew

to manhood, he resolved to put an end to him in some way, he cared little what way.

One day King Polydectes summoned Perseus into his presence.

"Perseus," said he, "it is time now for you to do something to repay me and my brother, the fisherman, for taking care of you and your honorable mother all these years."

"Oh, please your Highness," replied Perseus, "I am ready and anxious to render any service in my power to show my gratitude to you and your worthy brother."

"You are a brave young man," said the crafty king. "Now hear my plan. You know of the three monster Gorgons living afar off on an island. I have set my heart on having the head of the Gorgon Medusa to present to the beautiful Princess Hippodamia, who is soon to become my wife."

"It is a most perilous undertaking, your Majesty," answered Perseus; "but I am willing to risk my life for you, and free the land of

such a terrible monster as this Gorgon is said to be."

"Well said, my generous youth," replied the king. "You may go forth early tomorrow morning." So saying the sly old tyrant dismissed Perseus, exulting to himself that he was well rid of that youth for evermore.

As Perseus had only a day to prepare for his adventure, he went away by himself to think out his plan of attack. He remembered what he had heard of the Gorgons — that they had huge bodies covered with scales as hard as iron, and great hands of brass, and locks, not of hair, but of hundreds of venomous snakes, always writhing and twisting and squirming, and thrusting out their forked tongues.

Perseus was not afraid of all that. But it was said that one glance at this Gorgon was sure destruction; for no one had ever looked upon this face of Medusa who had not instantly been turned to stone. Now, pray, how could one attack a foe and *not* look upon him?

The more poor Perseus thought the more perplexed he grew. Just then, a voice close by was heard to say, "Perseus, you are sad; what is the matter?"

Perseus glanced up and there beside him stood a kindly looking stranger.

"Oh," answered Perseus, "I am not so sad as I am perplexed about an adventure I have promised to perform for the king."

"Well, well," said the stranger; "perhaps if you tell me what you have to do I may be able to help you. My name is Quicksilver."

Perseus gained courage from the stranger's kind manner and told him of the king's request to have the Gorgon's head as a bridal gift to the princess.

"And he requested," continued Perseus, "that I get the head for him, but I greatly fear I shall fail. For how can I escape being turned to stone?"

"We are well met," replied Quicksilver, reassuringly, "for I am the very one to help you. Do just as I tell you and fear not."

"First polish your shield so you can see your face as plainly as when you look in a mirror."

"That is queer," thought Perseus, "I should think my shield ought to be strong to defend me from the talons of the Gorgons." But agreeing to obey Quicksilver, he polished away at his shield with such vigor that it very soon reflected everything held before it as clearly as though it were made of glass.

Quicksilver smiled approval. "That is well polished," said he. "Now let us exchange swords. This blade of mine is shaped and tempered to cut brass or iron as easily as a little twig."

"Now we will go to the Nymphs," said Quicksilver, "and get three more things that you will need."

Away they hastened to the Nymphs, and Quicksilver told them the task that Perseus had before him. Quickly they disappeared, and as quickly returned, bringing the articles Quicksilver had asked them for.

"Put this around your neck, Perseus," said Quicksilver, as he handed him a curious deer-skin

purse. "Now put these sandals on your feet to make you light and able to travel more quickly in your journey."

"O I cannot keep on the ground!" exclaimed Perseus, when he tried to step in the sandals. For indeed, they lifted him straight up into the air.

"Come back, Perseus," called Quicksilver. "You cannot conquer the Gorgons without the invisible helmet."

So with some difficulty Perseus came down to the ground and Quicksilver slipped the helmet over Perseus's golden curls, and instantly there were no curls and no Perseus to be seen.

"Where are you, Perseus?" asked Quicksilver.

"Why, I am right beside you; don't you see me?" answered Perseus.

Quicksilver laughed and replied, "No, Perseus, I cannot see you; for the helmet has made you invisible. You are now ready to start for the Gorgons' island. Come, let us go!"

Immediately Quicksilver's cap spread out a pair

of wings. Up he floated into the air; and with a little leap, Perseus too, arose and followed Quicksilver.

"O how wonderful to sail along way above the earth!" cried Perseus.

Night came on, and Perseus watched the full moon rise and slowly ascend to her place in the heavens, growing brighter every moment. Then he watched the stars come out one by one, and thought how he should like to climb or fly up near the moon and always live near her.

But then he looked towards the earth and saw the seas and lakes and rivers, all shining and glistening, and the snowy mountain peaks, and low valleys, and stretches of field and wooded forest, and cities, and towns, all peacefully sleeping in the pure moonlight, and he thought earth looked quite as beautiful as any star or even the moon.

"We will soon be in sight of the Gorgons' island," said Quicksilver, as they flew across the wide ocean.

In a moment Perseus inquired, "How soon shall we be at our journey's end?"

"Look directly below you, Perseus," said Quicksilver; "do you see that island? The Gorgons are there on the shore."

"O where? I cannot see them!" cried Perseus.

"Go lower, Perseus," answered Quicksilver; "and you can then see them."

"Now I see them," cried Perseus. "They are lying at the foot of those great black rocks."

"Yes," said Quicksilver; "and they are asleep; so we will fly down as quickly as possible."

As they flew swiftly down through the air, coming every moment nearer the frightful monsters, Perseus exclaimed,

"What awful creatures they are! How shall I ever get near enough to them to strike my spear upon the Medusa? O if I am turned to lifeless stone!"

"Hold your shield, Perseus," said Quicksilver, "so as to catch the reflections of the Gorgons Remember, if you look in that, you will be safe, and remember you have on the helmet, so the Gorgons cannot see you."

They were now very near the Gorgons, and Perseus was about to strike when Quicksilver exclaimed,

HEAD OF MEDUSA.

"Wait, Perseus, one of them is stirring, she is waking. Do you see which one it is? If it is the middle one, she is Medusa. You might strike all your life at the other two heads, and never make any impression. So be sure you reach the Medusa head."

"Now is your time," whispered Quicksilver. "She has hidden her face again. O be quick, she may awake."

Perseus flew down close over the Medusa's head just out of reach of the snaky locks that were reaching up and straining hard to sting at Perseus and poison him.

Plunge went the sword. Medusa opened her eyes; but it was too late, Perseus's eyes were fixed upon his shield, and the head went rolling to the ground.

"Wonderfully well done!" cried Quicksilver. "Take now your magic wallet and put the head in quickly." And as Perseus took the purse from his neck, behold it expanded and grew large enough to hold the dreadful head.

"Now fly," said Quicksilver; "do not stop for thanks even; for you are in danger from the other Gorgons, who will do their utmost to revenge themselves for the loss of Medusa."

* * * * * * * *

A few hours later, while Polydectes sat amongst his people, telling them of the foolish task Perseus had taken upon himself, Perseus himself appeared before them.

"O you have brought the head of Medusa!" the king sneered. "Show us the Medusa head with the snaky locks, if you can!"

"O King Polydectes," cried Perseus, "remember the fate that follows the looking in the face of the Gorgon, and do not urge me to show the head to you and your people!"

"You villian," yelled the people, "show us the head or we will make a football of your own."

Perseus appealed again to the king, but he was with his people, and he demanded:

"Have you the Gorgon's head?"

"I have," replied Perseus.

"Then let us see it straightway, or your own shall be the forfeit."

"I have given you warning," shouted Perseus, now angered. "Look you, then, one and all! Behold the head of Medusa!" And snatching it from the wallet he held it forth. Not a subject had time to turn his head or close his eyes. One second, and King and all had turned to white, cold, lifeless stone.

PEGASUS.

While Bellerophon, a handsome young Greek, was at the court of King Iobates in Asia a most terrible and ugly monster — the Chimæra — appeared in the kingdom, laying waste the country for miles around. Tearing up fields of grain, burning the forests and even the villages and towns with his fiery breath that poured forth from three dreadful mouths. This dreadful creature was part goat, part lion, and part serpent. Its tail was like a serpent; like a serpent, too, was one of its heads. The others were like that of a goat and of a lion. And this Chimæra would squirm and run and bound all at once like the three animals he so resembled.

King Iobates was in despair. What to do he did not know. And one day he cried, "Bellerophon, will you rid the land of this awful Chimæra?"

"I will kill the monster or be killed in the attempt," replied the brave young man.

So forth he started from Lycia to Greece, carrying with him an enchanted bridle with which he was to tame the wonderful winged horse Pegasus, who should help him kill the Chimæra.

Now Bellerophon had heard that the winged Pegasus often came to a certain fountain of water in Greece to drink. This fountain he must find. And so he wandered on from day to day. At last, one evening as he was walking along a hillside, wondering where the fountain should be found, he saw a maiden drawing water from a gushing stream that bubbled forth from the side of the hill.

"I beg permission to drink of this clear water," said Bellerophon, gently addressing the maiden.

"This water is unusually cool and pure," he said, offering to fill the maiden's pitcher. "Has this fountain a name?"

"Yes," replied the maiden, "it is called the 'Fountain of Pirene.' My grandmother told me that this fountain was once a beautiful woman, who so grieved for her son who was killed by Diana's arrows,

that she dissolved in tears, which now come forth from this mountain side."

"Ah," thought Bellerophon, "this is the fountain! I have found the water that the winged horse so loves to drink! Here I must wait for his coming."

Day after day Bellerophon waited eagerly, watching the sky in all directions for the appearance of Pegasus. Day after day he watched and waited; but, alas, no Pegasus appeared.

"King Iobates will think I do not mean to keep my word to him," thought he, "but I must wait. I cannot kill the Chimæra without the aid of Pegasus."

As he was thinking these thoughts one day, after weeks of anxious waiting, he caught a reflection in the water that made him spring to his feet and look quickly to the sky. "It is Pegasus!" he whispered.

But when he looked he only saw a large white cloud floating by. "O dear!" he sighed; "it was only a cloud."

Bellerophon threw himself upon the bank, sad at heart. But, see! the head of a horse emerges from

the cloud! A second more and, sailing lightly downward, comes the beautiful white horse—the Pegasus for whom our hero longed!

Bellerophon crept swiftly into a thicket very near the fountain. There he remained watching with strained eyes every motion of the wonderful horse as it circled nearer and nearer the earth, flying always with marvelous ease and grace.

The nearer he came the more wonderful and beautiful he was to Bellerophon. And when at last he put forth his feet to step upon the earth, so light was he that the grass barely moved under his tread, and but the faintest mark was made by his hoofs on the shore of the water. Straight to the fountain he went. Then, after drinking of the refreshing water, he began to caper up and down the shore, half running, half flying, rolling over and over, then jumping up into the air and alighting as lightly as any bird.

Once or twice he stopped suddenly in his sport, pricked up his ears and gave little quick snorts, look-

ing all around as though he heard or saw or felt something near — but he scampered off again capering along as before, until at last, as Bellerophon had hoped, he paused directly beside where Bellerophon was hidden.

Now Bellerophon, on the watch every second, knew that his time was come to act.

So when Pegasus slowly spread his wings and put out his legs ready to rise from the ground, Bellerophon with one bound sprang upon his back and away they flew, rider and horse, up, up, up, hundreds of feet before Bellerophon could regain his breath, or even Pegasus could know what had happened.

But when he realized that a mortal was upon his back — O how he plunged and reared and kicked and flew, here, there, round and round, up and down, snorting and twisting and plunging with anger and fright!

Bellerophon was a wonderful rider, else he would not have been able to keep his place without a saddle,

with Pegasus twisting and turning and leaping over and under and through the clouds.

All this time Bellerophon had been closely watching his chance to push the golden bit into Pegasus's mouth and pull the bridle over his head.

In a twinkling it was done, and no sooner was it in place than Pegasus became at once quiet as a lamb, and looked around at Bellerophon as tamely and kindly as if he had never known anything different than the brave youth for his master all his life.

Of course I need not tell you that now Bellerophon, with Pegasus to help him, flew back to the aid of the suffering people in the kingdom of Iobates.

It was a terrible fight that he had with the monster Chimæra, but they conquered, the people were freed from their terror, and the king, so grateful was he, that there were no kingly favors or royal honors that were not ever after showered upon our brave hero Bellerophon.

CARRYING AWAY THE GOLDEN FLEECE.

THE RAM WITH THE GOLDEN FLEECE.

You have not forgotten in all this time, I trust, what we read of the zodiacal constellations, nor that one of these was called the Ram. You did not once imagine then what a wonderful ram it was — that it was a ram with a fleece of gold. But so it was; if you do not believe it, here is the story of it, exactly as the Greeks used to tell it hundreds of years ago.

Certainly you cannot doubt it now!

Phrixus and Helle were little brother and sister. Such bright, sunny, golden-haired children as they were. You would not believe any one could be cruel to such beautiful children as these were. But, alas, there was a wicked, evil-hearted woman, Ino, who hated the children — hated them for no other reason than that she was jealous of their mother; and when jealousy gets possession of the heart, dear little readers, it is a bitter, cruel thing. O how it lashes and scourges the heart that holds and cherishes

it, and how cruelly and blindly it will make even its most innocent object suffer!

The mother of the beautiful little boy and girl feared this cruel Ino, and suspected that she might, to revenge herself, plan some terrible harm to the children. Accordingly, she appealed to the good-natured Quicksilver or Mercury, for help.

Quicksilver, you know, was always ready to help. Indeed, he took a real delight in seeing the wicked schemers thwarted in their plans.

"You shall be given the ram with the golden fleece," said he to the poor mother. "Put the children upon his back and he shall bear them away out of the country, out of reach of harm."

The anxious mother was overjoyed. "Come Phrixus, come Helle, come!" called she. "Mount upon the ram's back and speed away across the water away from danger."

And away they sped across the water. I wish I could tell you that they reached the opposite country safely. But in such stories as these, it is so

necessary to tell the exact truth, you know. So although it makes the story a little less pleasing, I shall have to tell that poor little Helle lost her hold upon the shining fleece of the ram and fell into the water and was drowned; while the faithful ram hurried on with his precious burden, the little Phrixus, to the opposite shore.

No wonder Jupiter put this faithful ram in the skies among the heroes, the gods and goddesses. It is his golden fleece that shines so brightly there in the Zodiac.

But you know sheep may be sheared every year and that every year a new fleece grows. Now this ram must have been shorn once by mortals before Jupiter placed him in the high heavens; for a golden fleece— the fleece of this ram — was kept for years and years by a king on the island of Colchis.

* * * * * * * *

There was once a youth — Prince Jason was his name — whose throne had been stolen from him by

a man who had no right to it whatever. When Jason was tall and strong enough, he set out across the country to demand his kingdom from the usurper.

Now I do not know why Jason did not go against this king with an army and force him from his stolen throne. Perhaps it was n't the custom in that particular country. Instead, so the story tells us, Jason presented himself before the king, and in the politest possible language, told the king who he was and why he had come.

Naturally the king did not incline to abdicate to this youth; neither did he wish him to remain in the kingdom.

"I must send him on some perilous expedition," thought the king to himself. "You seem a very brave youth," said the king to Jason.

"I have been taught by my good teacher the Centaur Chiron to be brave," answered Jason.

"Let me propose a test to you," said the wily king. "Far away across the water, in the possession

of a king who is my enemy, hangs from the boughs of an enchanted tree, the golden fleece of the sacred ram. This fleece is guarded by a fiery dragon. Well do I know the danger to any youth who dares approach this dragon; still for that youth who shall subdue this monster and bring away the golden fleece, there is honor both from men and the gods.

"Not a youth in this kingdom has dared set out upon this perilous task. You are a brave youth. You will succeed. Go; bring away the golden fleece; and your kingdom shall be returned to you."

If there were space in this little book, I would tell you the story of his voyage to the island of the golden fleece; I would tell you what dangers he encountered; how he overcame them; and how, at last, triumphant, he escaped to his boat with the wonderful fleece, sailed away from the island, across the seas, and took possession of the kingdom that was always his by right of inheritance.

But all this I must leave to your imagination. *The Wonder Book* will tell you all about it.

THE MILKY WAY.

You must have noticed stretching over the sky, a path of white which looks like a long cloud. It is always there, and seems never to change in the least.

With the eye only, I think no one would ever find out its secret; but with the telescope, it has been found that what looks like a cloud to us, is really a mass of stars — so thick that the lights all run together, making what seems to us a white hazy cloud. Perhaps this doesn't seem possible to you; but it is so, and here is a way to prove it.

If ten boys and girls could each have a lantern, holding them all quite close together, and then if one of you should go up the street for quite a long way, you would find that these ten lantern lights would all seem to run together so that to you they would look like one big light.

So it is with those millions of stars which are all crowded together in the Milky Way.

THE SEVEN SISTERS.

In the winter months, there come up from the horizon, quite early in the evening, three bright constellations, following close upon one another. Of the three, the constellation that leads is the Pleiades or the Seven Sisters.

These seven sisters were very devoted and were always together. Orion, the hunter, always pursued them through the wood, over hill and dale. Notwithstanding their fleet-footedness, Orion had nearly overtaken them, when Jupiter caught them up, and placed them together in the sky far from the reach of harm.

There are only six of them to be seen, but that

does not spoil the story at all; for it is said that at one time, when there was a terrible battle going on down on the earth, one of the sisters hid herself in terror behind the others. One would suppose that she would have come out after the battle was over, but it seems she never has.

Another story accounting for her absence is that she fell in love with a mortal, and gave up her place in the heavens to come down and dwell with him. Since it is all a myth, you can take your choice of the stories.

Ay! there ye shine, and there have shone
In one eternal hour of prime;
Each rolling, burningly, alone,
Through boundless space and countless time!

TAURUS.

TAURUS.

Following close after the Seven Sisters comes Taurus, marked by a great V-shaped group of stars. Taurus is the Latin for bull, and the story is this:

Once several little princes and princesses were playing in the king's garden bordering upon the sea-shore, when there came out from the water a milky white bull. Now white bulls were considered very sacred animals in those days, and as they were also very rarely to be found, the older of the little

princes thought it a wonderful sign from the gods that this bull should be sent to them.

Accordingly they at once treated the bull to the finest clover they could find; and one of the little princesses made for it a beautiful garland of flowers, which she placed upon its head.

The bull seemed to enjoy it all, and when he kneeled before the little princess, her brothers said, "See, little sister, he wants you to get upon his back! he will take you for a ride!"

But no sooner had the little princess seated herself, than away flew the bull down to the water's edge. The brothers, frightened, ran after him, but he plunged into the sea and swam swiftly away towards the setting sun. The children watched him swimming away with the little princess upon his back, and heard in vain her piteous cries for help.

Never, never again did they see their little sister, although the oldest prince wandered over the country for many long years searching for her.

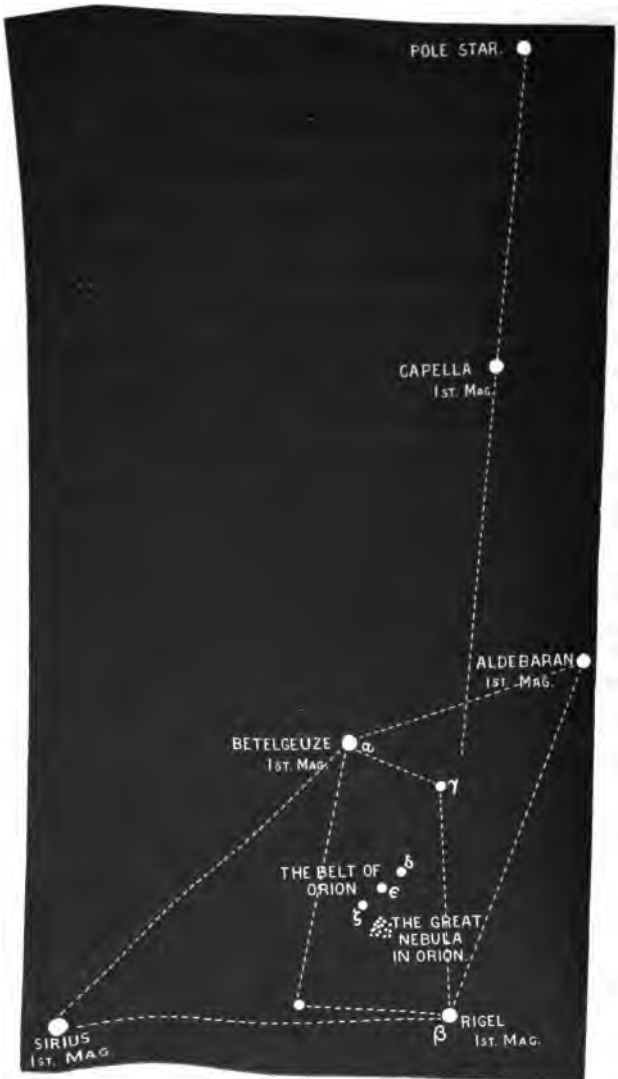
It was believed that Jupiter sent this white bull

for the purpose of stealing away this little princess, and when some of the wise ones saw this bull in the sky, they said at once that it must be the one that stole away the child so many years before.

I hope you will be as successful in seeing the whole bull as these people thought they were; but I am afraid you will have to be contented with finding five stars arranged in a V shape, which is said to be in the bull's head. The bright one at one end of the V is the bull's eye.

Ye are
A beauty and a mystery, and create
In us such love and reverence from afar
That fortune, fame, power, life, have named themselves a star.

— BYRON.



ORION AND SIRIUS.

ORION.

And now following Taurus, comes Orion, the brightest of the three constellations. You cannot fail to find it. It is as marked in the southern sky as is The Great Bear in the northern.

One of the most beautiful winter constellations, is Orion. There are so many stories told about Orion, and none of them true, you know, that I hardly know which to tell you. Here is one of them:

The goddess of the Moon had fallen deeply in love with Orion, the mighty hunter. Now her brother, the god of the sun. did not approve of Orion at all, and like many brothers, now-a-days, thought it his sister's business to be governed in all things by his taste.

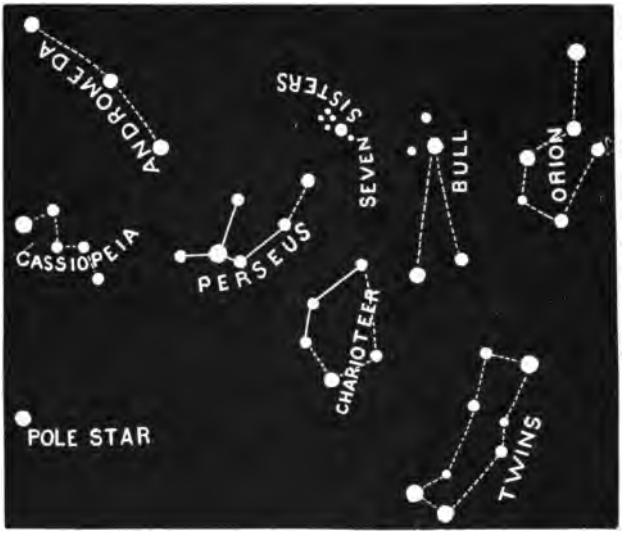
The Moon goddess did not think so; and as she would not obey her brother by throwing aside Orion, he resolved to destroy Orion. Soon an opportunity

came. As Orion was bathing in the sparkling waters, the Sun god sent his brightest rays upon him, causing him to shine like a piece of gold in the water.

Then the brother, calling his sister to him, said, "See, sister, that spot of golden sunlight in the water. Let us send our arrows upon it!" The Moon goddess, glad always to try her skill at arrows with her brother, bent her bow at once. Her aim was swift and sure. Orion sank, pierced through the head by the arrow of his much loved goddess.

When she learned what she had done, she was wild with grief. She begged Jupiter to give back Orion's life. But Jupiter could not do that. So, pitying her grief, he lifted him into the sky, that the moon goddess may look upon him as she goes sailing by at night in her beautiful chariot.

The two dogs — Canis Major and Canis Minor — are Orion's dogs, swift, fleet, beautiful animals whom Orion loved as all brave hunters love their dogs.



THE TWINS.

Not far from Orion are two bright shining stars, marking the constellation of the twins. Their story is thus: —

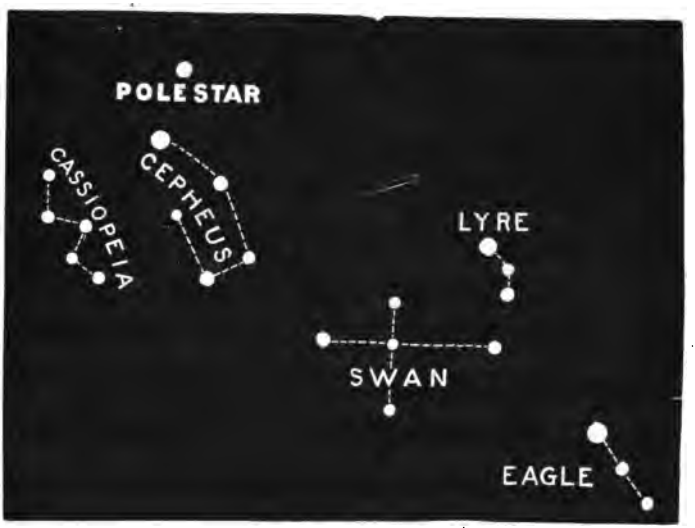
Once upon a time, two little baby boys came out of two white swans' eggs. These little boys, as they grew up, became mighty warriors. They were often in terrible battles, but no weapon ever harmed them.

It was believed that they were watched over by

the gods; and that the beautiful milk-white horses they always rode, were a gift from Jupiter himself. But at last one of these twins received a death wound.

His brother went often into battle alone after this, but his heart was very lonely and he prayed continually to Jupiter to give back his brother to him.

Jupiter could not do this; but he so pitied him, that he let him die, and put them both in the sky together. There they sit, with their arms about each other, and seem very happy, if one can judge from their twinkling, bright eyes.



THE SWAN.

You have noticed that hazy, whitish band of light stretching across the sky from horizon to horizon, and you have already learned its name — *the milky way.*

You have heard that the whitish appearance of that band is due to millions upon millions of stars so numerous and so close together that their lights all run into one another as we look at them, so that, instead of seeing so many little points of light, we see this great sheet of whitish light.

In and close about this milky way, are some very interesting constellations. Of these, let us read first of the Swan, the Eagle, the Archer, and Berenice's Hair.

The Swan is a constellation *in* the milky way. The stars are in the shape of a cross.

This swan was once a brave youth, a friend of another brave youth whose name was Phaeton. Phaeton once asked permission to drive the chariot of the sun through the sky. He was granted permission, and set out upon his wild ride.

His horses and chariot proved too much for him. After setting fire to the earth in several places, and doing considerable other harm, the chariot of the Sun was taken away from him, and Jupiter ordered him to be drowned as a punishment for daring to drive the Sun's chariot.

Then it was that his friend wept his life away for his loss. Jupiter, pitying him, changed him into swan and placed him in the sky. The brightest star is *Deneb*.

ORPHEUS, EURYDICE AND MERCURY.

THE LYRE.

Very near the Swan, lies the Lyre. In art galleries and in art magazines, you very often will come across the above picture. It is so very common, that it seems a pity you should not know its story. We will read it here; then when you see the Lyre

in the sky you will think of the picture, when you see the picture you will think of the lyre, and when you see either, you will remember their story.

There was once a man named Orpheus, who could make such beautiful music on the lyre, that all who heard stood transfixed. Even the stones would lift themselves to listen. So greatly did Jupiter admire this music of Orpheus, that he had the lyre placed in the sky.

The story told of Orpheus is, that when his beautiful wife, Eurydice, died and went down in the under world where, as the Greeks believed, all went when death called them, Orpheus begged of Jupiter that he might be permitted to go down into Hades to find her.

"Know you not that the entrance is guarded by the three-headed dog, Cerberus?" said Jupiter.

"I know," answered Orpheus, sadly; "but I dare meet even Cerberus if I may but see my wife Eurydice again."

Then Jupiter granted him permission, and Orpheus,

taking his wonderful lyre with him, went down into Hades, the under world.

How Cerberus growled and glared and gnashed his teeth and snorted and shook his three horrible heads! But Orpheus had little fear. Well did he know the power of his music. Certainly if the rocks would lift themselves to listen, he might even expect to charm the three-headed dog of Hades, horrible though he was.

Yes, even Cerberus ceased his growling and listened. Then he wagged his tail — not lashed it, mind you, as he was said to do at the approach of a shade from the upper world — but just wagged it in as contented, good-natured a way as ever a dog was known to wag.

Then Orpheus passed on into the great under world, into the presence of the very king himself — the king of the under world, Pluto.

"A shade from the upper world!" thundered Pluto.

"I come for my wife Eurydice," replied Orpheus, calmly beginning to play on his lyre.

Pluto thundered and roared. But Orpheus played on and on as quietly as if Pluto's threats were but the sweetest song.

Well, I have no idea what Pluto said, or how it came about; but in a very few minutes — so we are told — the fiery Pluto, too, became as gentle as Cerberus, we will say for the sake of keeping the comparison with something in his own realm, and even told Orpheus that Eurydice should go back with him to that upper realm, but on one condition.

The condition was that Orpheus should turn at once towards the entrance through which he had just come, should pass out, not once looking either to the right or to the left, or back until he had passed the dog, Cerberus, and was again in the upper air.

"Eurydice, if thou obeyest my will," said Pluto, "shall follow thee."

Orpheus promised and turned to go. But, alas! as he neared the entrance and saw the great dog Cerberus, he realized that if once he passed

outside, never again would Jupiter permit him to enter this land of shades.

As he recalled all this, so great a fear seized upon him lest Eurydice might not be following, even though Pluto had promised, that he turned to look. His anxious gaze fell upon his beautiful wife coming slowly, slowly forward.

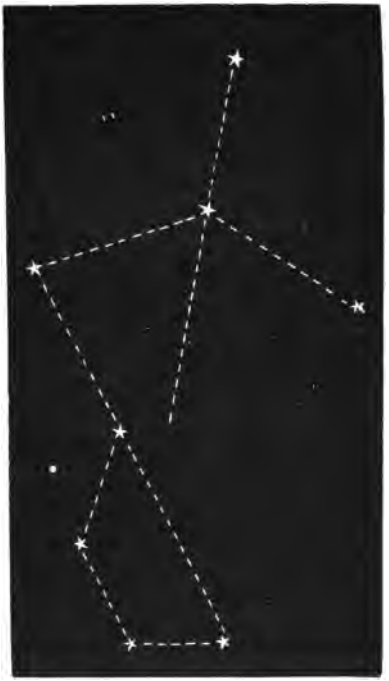
But alas! in an instant there arose a great sound as of thunder. Orpheus had disobeyed. The lightnings flashed, the thunder rolled peal on peal. Poor Orpheus was driven forth into the upper world — and alone; he had lost the beautiful Eurydice.

Then Orpheus grieved himself to death; and Jupiter, pitying him and not wishing his name to be forgotten, took the wonderful lyre and placed it in the sky. Just where he placed it you will find marked by a great beautiful *blue star*, Vega.

AQUILA OR THE EAGLE.

Again close to the Swan is the Eagle — Jupiter's eagle!

Jupiter and his wife Juno each had a pet bird. Jupiter's pet bird was an eagle, and Juno's was the peacock. This eagle in the sky, marked by the three bright stars in a straight line, is supposed to be the eagle of Jupiter. Its brightest star is *Altair*.



THE ARCHER.

On the southern border of the Milky way, quite a distance below the eagle, are two groups of stars which are so bright and clear, and whose arrangement is so marked, your eye will be sure to be attracted by them. The four farthest from the Milky Way look very much like a dipper, while the other four look

so much like the head of the cross in the Swan, that at first you might think it is the cross. These stars make the constellation called the Archer. The dipper-shaped part is his body, and the four other stars make his bow and arrow.

There is n't very much of a story about it after all. In the early Greek times there used to be a wonderful school-master, named Chiron. All the great heroes of Greece were said to have been educated by him. You will think he was a very strange sort of a school-master when I tell you that he had the legs and body of a horse and the shoulders and head of man.

Now this schoolmaster was very strict, and used sometimes to give the idle pupils rather hard hits with his big hoofs; still, when the lessons were learned, this good old master could kick up his heels in a very coltish manner and enjoy a good frisk with the boys.

This schoolmaster was a wonderful archer. It was he who taught the Grecian youths the use of the arrow and when this wonderful schoolmaster died, Jupiter had him placed in the skies.

BERENICE'S HAIR.

If you draw an imaginary straight line from the Pole Star down through the bend in the handle of the Great Bear, or Big Dipper, as from its shape we are wont to call it, the line would extend between two constellations quite close together — Berenice's Hair and Bootes, the Hunter.

Berenice's Hair looks like a bit of Milky way, and is, no doubt, the mingled light from a countless number of stars close together, or at least, seeming at our great distance from them to be close together.

Berenice was the wife of an Egyptian king. One time when he had occasion to go on a very dangerous journey, she went to the temple to pray the gods to restore her husband safely to her.

As she prayed, so the story goes, she heard a voice saying, "Berenice! Berenice! offer up thy beautiful hair as a sacrifice to the gods." Now, Berenice was very proud of her beautiful hair, and,

indeed, it was considered a most disgraceful thing for a woman to have short hair.

Still, since she believed that the safety of her husband depended upon the sacrifice, and that the gods themselves had bidden her, she bowed her head before the priest, and had the golden locks — or perhaps they were sunny brown ones, or even jetty black — shaven. Then she laid them upon the altar, asking the gods to accept her sacrifice.

They did so, no doubt; for the next day her locks had been taken away. Of course Berenice was terribly anxious to know whether this was a good or a bad omen — whether the gods had accepted them and had carried them to their own home in the skies, or whether they had cast them out of the altar as an unworthy offering.

The priest, however, assured her that they had been accepted; and leading her forth into the starlight, pointed out to her this mass of hazy stars. These, he said, had appeared for the first time on the same night the beautiful hair had been taken from the temple,

which proved that these stars and her hair were one and the same.

And as Berenice had never noticed the stars very much, and so did not know that this group had been there since the world began, she believed the priest's story, and went home happy in the belief that her husband would come to no harm.

I am sure, we hope he reached home, and appreciated what a loving wife he had. No doubt, in the years that followed, he used often to take his children out into the starry night, and show them their mother's golden hair, and tell them just how it came there. Very likely he did; the story does not tell.

Silently, one by one, in the infinite meadows of Heaven,
Blossomed the lovely stars, the forget-me-nots of the angels.

LONGFELLOW.

BOOTES, THE HUNTER.

If you follow the handle of the big dipper downward in a curved line, you will come to a very beautiful red star, or, as we said in the preceding story, extend a straight line from the Pole Star through the bend in the handle of the dipper and it will pass

through the two constellations Berenice's Hair and Bootes, the Hunter.

Berenice's Hair we have already found. Now, upon the other side of the imaginary line we find the consellation Bootes with its great, beautiful red star, Arcturus.

Passing straight up from Arcturus we come to two not very bright stars. These form the belt of Bootes.

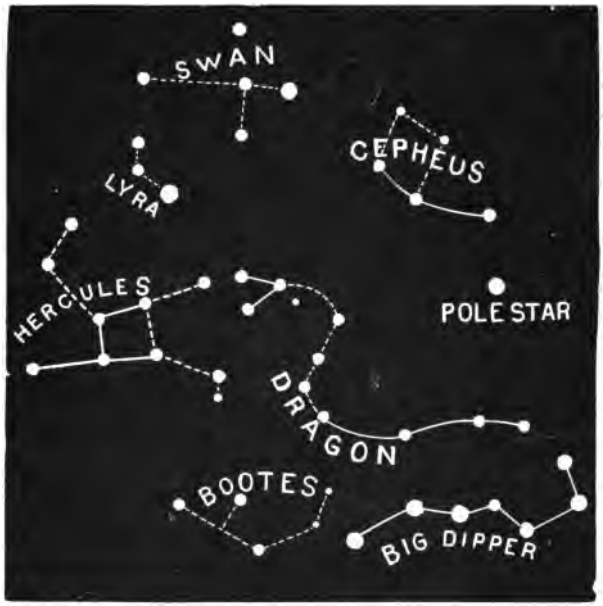
Straight up a little farther, are three stars in the

shape of a triangle with its base down. These form the shoulders of Bootes.

There is nothing to say about this Bootes, except that he was a mighty hunter and was placed there by Jupiter to guard the Bears and keep them from all harm. We should hardly notice the constellation, were it not that it contains the beautiful Arcturus, and then, too, it is so easy to find.

But the day is spent,
And stars are kindling in the firmament,
To us how silent — though, like ours, perchance,
Busy and full of life and circumstance.

— SAMUEL ROGERS



HERCULES.

After all the stories of constellations commemorating the deeds of Hercules, one would certainly suppose there would be one constellation honoring, with his name, the great hero himself. And such there is.

Not far from Bootes, with only the semi-circle of stars — the Crown, as it is called — between them, stands in all its majesty the large constellation called

Hercules. He has — and in art you will always find him so represented — a great lion-skin either over his shoulders or over the column upon which he is often represented as leaning — the skin of the wonderful Nemean lion.

This Hercules, so Grecian mythology tells us, was a hero, even from his very babyhood.

Jupiter, for some reason, hated Hercules — hated him, if I remember rightly, because some one had told him that the babe, Hercules, would some day come to be a greater power in the world than was Jupiter himself.

Naturally, the jealousy and rage of a god like Jupiter would be aroused by so unflattering a prophecy as this, and it was because of this, that he sent two great serpents to the cradle of the child to destroy him.

Across the great hall where Hercules lay asleep, up the side of the cradle the wicked monster crept. Straightening up their heads, they were just about to dart their cruel fangs into the child, when up he sprang, seized the monsters by the neck, and dashed their heads out against the sides of the cradle.

Of course from this everybody knew that Hercules was destined some time to be great.

All through his boyhood and youth just such wonderful things were done by him, until at last his uncle, jealous of the praise and admiration that were poured upon this lad, began to plot his destruction.

He did not quite dare to kill him himself; so he devised terrible tasks for him to do — tasks which seemed certain death to him — though each time, as the lad went forth bravely, the cruel, deceitful old uncle would say to him, "Be brave, be daring, my good lad. Return conqueror and your name will be placed with Perseus and Theseus, the Grecian heroes."

These tasks which the uncle set for Hercules are called in Grecian Mythology "*The Twelve Labors of Hercules.*"

The "First Labor" was to kill the Nemean lion of which you have already read.

The second was to kill a terrible serpent that lived in the country of Lerna. This serpent, it was said, had nine heads, one of which was immortal. To be sent

to kill a serpent that the gods had already pronounced immortal was indeed a hopeles task! But Hercules set forth bravely. Perhaps he was conscious of a power in himself of which no one else knew.

He attacked the serpent with his club; but as fast as he struck off the heads others grew. At last he burned them off — all except the one that was immortal, and that one he put under a great mountain, where, no doubt, since it was immortal, it is living to this day.

The "Third Labor" was to overtake and bring home a wonderful stag — a stag with golden hoofs and golden antlers, and so swift that no hunter had ever been able to overtake him.

The "Fourth Labor" was to overtake a horrible boar that had an unpleasant habit of rushing down upon the villages and destroying everything in its way.

The "Fifth Labor" was to clean the Augean stables. These were stables in which great herds of cattle were kept. It was a vile, filthy task to set for

the high-minded youth. But Hercules was not to be defeated. Finding that a large river ran not far from the filthy stables, he dug, one night, a canal from the river to the stables, and let full upon them the great force of the water.

The "Sixth Labor" was to fight against a great army of horrible, poison-winged, brass-clawed birds. In this, Minerva, the goddess of wisdom, helped him by giving him two great metallic shields, which so frightened the birds that they flew away in terror, leaving the forest, that had so long been a place fearful to all travelers, free and no longer dangerous.

The "Seventh Labor" was to kill a great white bull that for ages upon ages had been tearing up and down the country, frightening the people and destroying the villages.

The "Eighth Labor" was to capture some fierce steeds, whose owner, it was said, fed them on the blood of slaves just before he went into battle, that they might be strong and fierce.

The "Ninth Labor" was to take a beautiful girdle

from the queen of the Amazons — a tribe of warlike women.

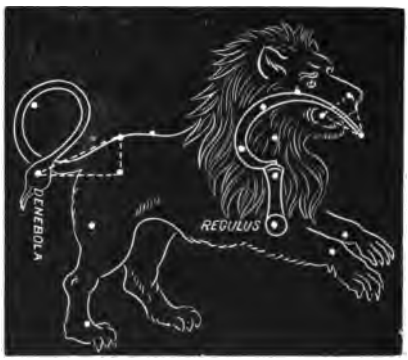
The "Tenth Labor" was to find the land of "the purple oxen," and to bring the oxen home. No one knew where this was, only that it was away across the great, wide ocean.

The "Eleventh Labor" was to gather "the golden apples" that grew somewhere in a country away beyond the setting sun. These apples, it was said, were guarded by a horrible three-headed dragon.

The "Twelfth Labor," and the last, was to go down into the under world and bring forth the great three-headed dog, Cerberus.

"He can never do that, surely," said the uncle, angrily, between his teeth.

But Minerva helped him again; and when the uncle saw even this labor performed — a labor which, without the aid of the gods, no mortal could have performed — he knew it was useless to try to rid himself of the lad. "He bears a charmed life," said he; and Hercules was then allowed to go in peace.



THE LION.

But look back at Berenice's Hair — now a little way beyond — now up towards the Great Bear. Do you not see a group of stars arranged exactly in the shape of a sickle?

These are in the head and shoulders of the Lion. You have already heard of Hercules and the terrible tasks his uncle set him to do. To capture this lion was one of those tasks. Now this lion was an enchanted lion, and his hide was so tough that no arrow could pierce it. The uncle of course knew this, although Hercules did not.

When Hercules had shot all his arrows in vain, he rushed bravely up to the lion's very mouth, seized him by the jaws, and drove a heavy club down his throat.

The lion at once, being an enchanted lion, became as quiet as a lamb, and allowed Hercules to kill him and take off his hide without one growl, no doubt. This, then, is the lion that we now see in the sky.

Lo! the small stars, above the silver wave
Come wandering up the sky, and kindly lave
The thin clouds with their light, like floating sparks
Of diamonds in the air; or spirit barks,
With unseen riders, wheeling in the sky.

—ALBERT PIKE.

THE LEGEND OF THE STAR-FISH.

There is in the sky a constellation, the stars of which are arranged very much in the shape of a fish. I have not asked you to look for it, for it is not very large, nor very easy to find.

There is a story told of the star-fish which of course you find every summer at the sea-shore, in connection with this constellation. It is not a Greek story — it does not sound at all *like* a Greek story; but it is pretty and I would like you to know it. It will give you a new interest in the star-fishes that you will see next summer at the sea-shore.

"Many, many years ago, before the world looked as it does now, when the oceans were very large and the dry land exceedingly small, it happened that high up in the heavens there was great trouble and excitement among the stars.

"They had always been very quiet and peaceable, loving one another and never longing for anything

that was beyond their reach; but at this time a new star was born, and he had an entirely different nature from all the others. He was selfish, dissatisfied, and altogether disagreeable.

"One thing that troubled him much was that he belonged to the family of the Fish. Now you know there are so many stars in the heavens that they are divided into families; there is the family of the Lion, of the Crab, of the Dog, and so on; and this wretched little star was foolish enough to imagine that his family was not quite so aristocratic as some of the others, so he fretted and fumed, making himself and others very uncomfortable.

"His kind and peaceable neighbors bore with him as long as they could, but at last he became intolerable, so the Fish stars held a meeting to see what could be done with their unruly brother.

"They asked him why he was so unhappy and cross, and he answered that he had rather never have been born than have had to associate with the common people he had seen all his life. There were

other families more aristocratic, where he could have passed a happier life.

"Then the Queen Lady of the Fish stars bade him be good and quiet, or else he would be banished from the beautiful blue heavens.

"They allowed him a year for improvement, but there was no change in the star's behavior; he quarreled as much as ever, and made every one most unhappy.

"Then he heard the startling news that he was to be sent hurling through the air, down to the earth below him. He begged, he pleaded, he promised to be good, but in vain; the verdict had been passed, and could not be recalled.

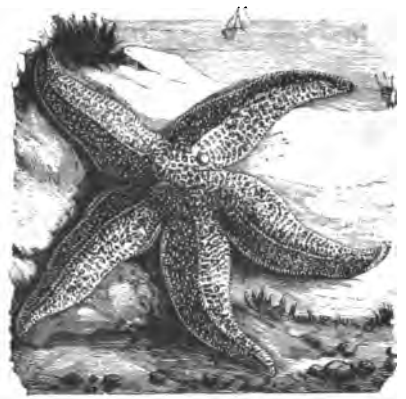
"So, on a cold and cheerless night, downward through the bitter air sped the wretched star. Where he was going he knew not; behind him the clouds had hidden the stars, his only friends, and before him was a darkness that could be felt.

"Hark! A voice from amidst the blackness he heard as a whisper, and it said: 'Thou who hast

always despised the family of the Fishes shall become one in reality!'

"And the Star-fish may often be seen on sea-shores, among the crevices of rocks, alone and deserted, sadly gazing upwards to its old home and friends!"

—MRS. E. D. CHAPMAN.



A CHILD'S DREAM OF A STAR.

Now one more story — and this is not Greek either, but just a beautiful dream-story written by Charles Dickens:

"There was once a child, and he strolled about a good deal, and thought of a number of things. He had a sister who was a child, too, and his constant companion.

"These two used to wonder all day long. They wondered at the beauty of the flowers; they wondered at the height and blueness of the sky; they wondered at the depth of the bright water; they wondered at the goodness and the power of God, who made the lovely world.

"They used to say to one another sometimes, 'Supposing all the children upon earth were to die; would the flowers, and the water, and the sky, be sorry?' They believed they would be sorry.

"'For,' said they, 'the buds are the children of

the flowers, and the little playful streams that gambol down the hillsides, are the children of the water; and the smallest bright specks, playing at hide-and-seek in the sky all night, must surely be the children of the stars; and they would all be grieved to see their playmates, the children of men, no more.'

"There was one clear, shining star that used to come out in the sky before the rest, near the church spire above the graves. It was larger and more beautiful, they thought, than all the others, and every night they watched for it, standing hand in hand at a window.

"Whoever saw it first cried out, 'I see the star!' And often they cried out both together, knowing so well when it would rise, and where. So they grew to be such friends with it, that, before lying down in their beds they always looked out once again to bid it good-night; and when they were turning round to sleep, they used to say, 'God bless the star!'

"But while she was still very young — O, very, very young,— the sister drooped and came to be so

weak that she could no longer stand in the window at night; and then the child looked sadly out by himself, and, when he saw the star, turned round and said to the patient, pale face on the bed, 'I see the star!' and then a smile would come upon the face, and a little, weak voice used to say, 'God bless my brother and the star!'

"And so the time came — all too soon — when the child looked out alone, and when there was no face on the bed; and when there was a little grave among the graves not there before; and when the star made long rays down towards him, as he saw it through his tears.

"Now, these rays were so bright, and they seemed to make such a shining way from earth to heaven, that when the child went to his solitary bed, he dreamed about the star; and he dreamed that, lying where he was, he saw a train of people taken up that sparkling road by angels. And the star, opening, showed him a world of light, where many more such angels waited to receive them.

"All these angels who were waiting turned their beaming eyes upon the people who were carried up into the star; and some came out from the long rows in which they stood, and fell upon the people's necks and kissed them tenderly, and went away with them down avenues of light, and were so happy in their company, that, lying in his bed, he wept for joy.

"But there were many angels who did not go with them, and among them one he knew. The patient face that once had lain upon the bed was glorified and radiant; but his heart found out his sister among all the host.

"His sister's angel lingered near the entrance of the star, and said to the leader among those who had brought the people hither, 'Is my brother come?'

"And he said 'No.'

"She was turning hopefully away, when the child stretched out his arms, and cried, 'O sister, I am here. Take me!' And then she turned her beaming eyes upon him, and it was night; and the

star was shining into the room, making long rays down towards him as he saw it through his tears.

"From that hour forth the child looked out upon the star as on the home he was to go to, when his time should come; and he thought that he did not belong to the earth alone, but to the star, too, because of his sister's angel gone before.

"There was a baby born to be a brother to the child; and while he was so little that he never yet had spoken a word, he stretched his tiny form out on his bed, and died.

"Again the child dreamed of the opened star, and of the company of angels, and the train of people, and the rows of angels with their beaming eyes all turned upon those people's faces.

"Said his sister's angel to the leader, 'Is my brother come?'

"And he said, 'Not that one, but another.'

"As the child beheld his brother's angel in her arms, he cried, 'O sister, I am here! Take me!'

And she turned and smiled upon him. And the star was shining.

"He grew to be a young man, and was busy at his books, when an old servant came to him, and said, 'Thy mother is no more. I bring her blessing on her darling son.'

"Again at night he saw the star, and all that former company. Said his sister's angel to the leader, 'Is my brother come?' And he said, 'Thy mother!'

"A mighty cry of joy went forth through all the star, because the mother was reunited to her two children. And he stretched out his arms, and cried, 'O mother, sister, and brother, I am here! Take me!' And they answered him, 'Not yet.' And the star was shining.

"He grew to be a man whose hair was turning gray, and he was sitting in his chair by the fireside, heavy with grief, and with his face bedewed with tears, when the star opened once again.

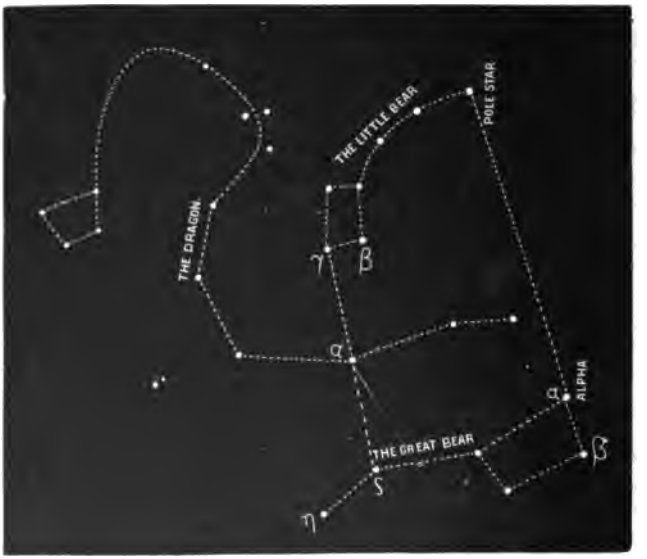
"Said his sister's angel to the leader, "Is my brother come?"

"And he said, 'Nay, but his maiden daughter.'

"And the man who had been the child saw his daughter, newly lost to him, a celestial creature among those three; and he said, 'My daughter's head is upon my sister's bosom, and her arm is around my mother's neck, and at her feet there is the baby of old time, and I can bear the parting from her, God be praised!" And the star was shining.

"Thus the child came to be an old man, and his once smooth face was wrinkled, and his steps were slow and feeble, and his back was bent. And one night as he lay upon his bed, his children standing round, he cried, as he had cried long ago, 'I see the star!'" They whispered one to another, 'He is dying.' And he said, 'I am. My age is falling from me like a mantle, and I move towards the star as a child. And O, my Father, now I thank thee that it has so often opened to receive those dear ones who await me!'

"And the star was shining; and it shines upon his grave."



STAR-GAZING.

And now after all these stories, before you and I say good-bye to each other, let us take one walk under the great starry arch above us. As people say, let us go "star-gazing."

First of all, let us begin with the "Big Dipper" — everybody begins with the "Big Dipper." There

it is — towards the north, of course, and such a big, big dipper as it is. It is the *one* figure that everyone might agree upon, as really and truly looking like the object it is named for.

"The pointers," you remember, point directly to the north star. Never forget that. And one thing more about these pointers. The distance from one to the other is agreed upon by star-gazers, as the unit of measure to be used in reckoning distances in the sky.

The pointers, pointing upward, we have just seen, point directly to the north star; again, the pointers, pointing downward, direct you to the bright star *Regulus*, in the constellation of the *Lion*; and again, still, the stars ς and η point directly to the bright *Arcturus* in the constellation of the *Hunter*, or *Bootes*. So much for the "*Dipper*."

Now, let us turn to *Cassiopeia*, the *W* shaped constellation not very far from the *Pole Star*.

You did not know that *Cassiopeia* makes an excellent illuminated clock. But she does. Take

that star at the upper point of the W *farthest from* the Pole Star, as your hour hand.

This star can be used as the hour hand of the great clock of the Universe. When this star is above the Pole Star it is noon, when in the west, at right angles to the first position, it is six o'clock P. M. At midnight it is on the northern horizon, and at six A. M., it is due east.

A little practice will enable one to read time from this, with an error not exceeding twenty minutes. In this constellation of Cassiopeia there is seen from time to time, a "new star."

This new star, which was seen by Tycho Brahe, the great Danish astronomer, in November, 1572, appeared in the place indicated in the figure. It

was brighter than the planet Jupiter. It lasted sixteen months, then faded away. A bright star has been seen in the same place in 945 and 1264. This would make the average interval about 313. This, plus 1572, the date of its last appearance, would give 1885. The star has not yet appeared, but may come during the next twenty years.

Now let us find the "Little Dipper;" not quite so easy to find as the "Big Dipper," perhaps, but we can find it. There it is, up above the "Big Dipper," pouring its contents straight down into it, so one might think from its position.

Let us leave the circumpolar constellations. Here is Orion, with his bright shining belt.

In Orion are two *first magnitude stars*, Betelgueze and Rigel; the former is in the shoulder and the latter in the foot of Orion. The three stars in a line are the belt of Orion, while the fainter row below is called the Sword. The belt points down to *Sirius*, the brightest star in the heavens, and up to *Aldebaran*, the eye of the Great Bull.

This belt was called by Job the "Bands of Orion."

This section of the skies is especially rich in first magnitude stars. Count the Pleiades and the Hyades. Note that *Betelgueze*, *Sirius* and *Procyon* make an equilateral triangle.

Do you see three very bright stars forming, if you imagine lines connecting them, an equilateral triangle?

Those three stars are *Betelgueze*, *Sirius*, (the dog star) and *Procyon*.

Now add one more very bright star to these three — one that with them will form a perfect diamond-shaped figure. The fourth star — the one you have just added — is *Rigel*.

Well, well, these are words enough for little folks to learn in one evening.

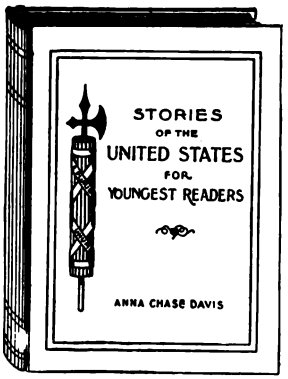
We had better, all of us, go back now to our own warm homes. Another night, we will "star-gaze" again, and another night again — until you wise little people will not say, as your

fathers and mothers used to say when they were children:

Twinkle, twinkle, little star,
How I wonder what you are!
Up above the world so high,
Like a diamond in the sky.

Instead, you wise young people will say:

Twinkle, twinkle, little star,
I don't wonder what you may be,
For I have learned more things of you
Than you can ever learn of me.



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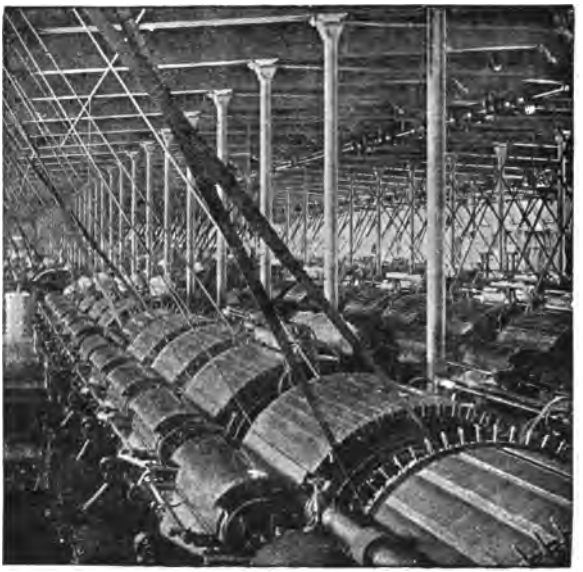

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