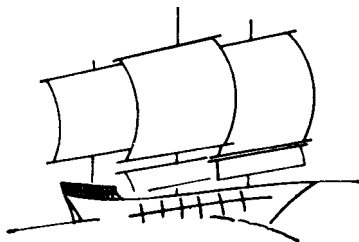
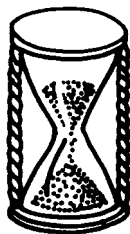

Christopher Columbus has gone down in history as the man who discovered America. He was looking for a way of getting to the East by sailing west. It was hard for him to get help for this journey. He was laughed at by most people when he said he could go this way to India because the earth was round.

This is the sort of ship Columbus sailed in.

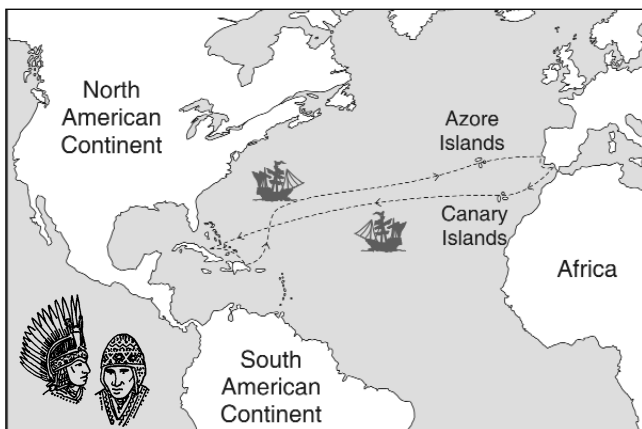


He made use of a half-hour sand glass for measuring time at sea. Through all the long months the glasses on Columbus's three ships had to be turned every half-hour as the sand ran out.



gone down: been given a place. When a person's name goes down in history something he has done is recorded in history books.

could: in this sense, would be able to—as used on the opposite page.

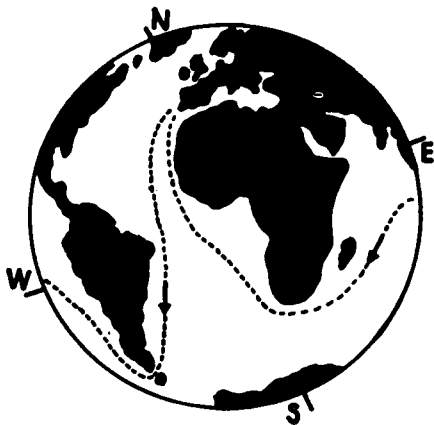


People living in America were named Indians by Columbus because he thought he had got to India when he discovered America. He went back to Spain without knowing that he had found a new continent. He knew nothing of the life that had been going on in North and South America for thousands of years or of the two great peoples, the Aztecs and the Incas, who had been living there—the one in Mexico, the other in Peru—for centuries. It is now thought that in 1500 the population of the Americas was about 30 million, and that the first of these “Indians” had come from Asia themselves. There may have been a land bridge between Asia and Alaska across which they could have come.

continent: Europe, Asia, Africa, North America, South America, Australia and Antarctica are the continents of the world.

it is now thought: scientists now think.

Thirty years after Columbus discovered America, the ship of Magellan, a sailor of Portugal, was the first to make its way south of South America and on round the world through the Indian Ocean and past the Cape of Good Hope back to Europe.



Magellan himself died on one of the Philippine Islands on April 27 (in) 1521.

When a ship sailed out to the west and came back home from the east three years later people could see that the earth must be round. This proved that the earth was round. It was proof enough for most people.

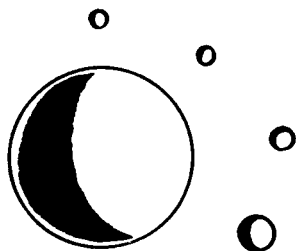
sailor: man who works on ships at sea.

cape: piece of land pointing out into the water.

hope: see page 185.

But it was harder to take in the idea that the earth might be moving round the sun, as Copernicus of Poland, 1473–1543, said it was. Very few people had made any sense of the writings of Copernicus by the time he died in 1543, twenty-one years before Galileo and Shakespeare were born. Few people could read or write in those days.

It was Galileo who made the first telescope, through which he could watch the stars and look into the ideas that Copernicus and others had been working upon. Through his telescope the stars seemed more than thirty times as near, and he could see not only the mountains of the moon but spots on the face of the sun, and the motion of the moons moving round the planet Jupiter.

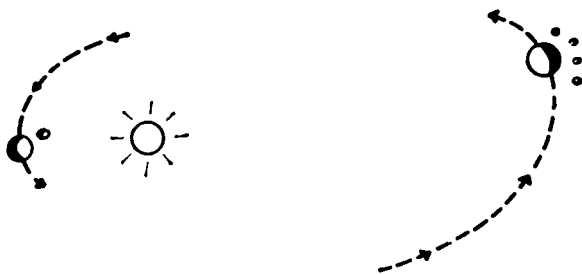


very few: opposite of very many.

spot: small mark.

Jupiter: Jupiter is the name of one of the planets—great bodies which are moving round the sun as the earth is.

Galileo could let people look through his telescope but he could not make most of them see the picture of the universe that was becoming clear in his mind.



He could not do that any more than Copernicus had been able to do it. People's ideas were changing, but not as quickly as his.

Galileo was put in prison for saying that the ideas written down by Ptolemy fifteen hundred years before did not make sense to him.

universe: everything there is.

prison: place where wrongdoers or those said to have done wrong are locked up.

Newton, who was born the year that Galileo died (1642), took the new line of thought much farther.

Like Galileo he became a great watcher and recorder, asking the question “how,” more than “why” and answering by measuring and recording and comparing and proving.



Even more than Galileo, he saw the universe as part of a great machine, and he was able to put into words great natural laws—accounts of its workings.

comparing: finding where and how things are the same or different.

law: laws which are made by people are statements, backed by government power, controlling what one may or may not do. When some laws are broken, the person who breaks them, if it is proved that he did so, may be put in prison.

natural: laws not made by people.

natural law: statement of causes and effects at work everywhere.

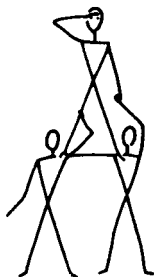
will compare
will break

compare(s)
break(s)

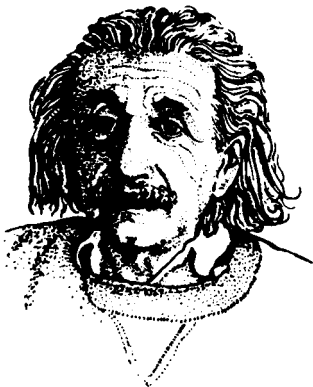
compared
broke, broken

He was able to do this only because he was carried forward on the shoulders of such men as Galileo, Kepler and Copernicus. With their work before him he could think out new ideas about the weights of things and their motions. His Law of Gravitation says that all things in the universe have an attraction for one another. (See *EP 2*, pp. 78–97.)

It was only by standing on Newton's and other scientists' shoulders that Einstein (1879–1955) was able to get his picture of the universe and work out new ideas about time and space and energy.



Their work made it possible for him to see farther into the laws of the universe than they could. Younger scientists in their turn are developing new ideas made possible by Einstein.

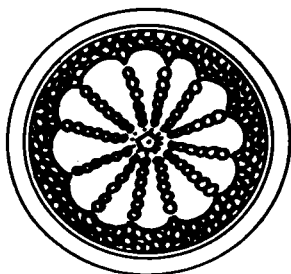


about: in this sense, *of*.

shoulder: part of body between arm, neck and chest.

The thinking of scientists has become clearer and truer as their instruments have become better. Galileo made one of the first microscopes as well as the first telescope, and by the middle of the seventeenth century this new instrument had opened up another world, a world of things too small for our eyes by themselves to see.

The microscope made possible the discovery of the cell structure of all living things.



The same seen through
a microscope

Even the human body could be pictured now as a great machine with millions upon millions of working parts, each part a cell.

structure: how a thing is made up; the way its parts are put together. The structure of the plant stem in the picture above, right, is made clearer by the microscope.

human: like a man or woman, different from animals.

Together with all this new knowledge of the cell structure of plants and animals, the microscope opened up a world of living beings so small that people had no idea such things were possible.

It was a surprise to the scientist to see that in a drop of water there might be thousands of living things of many different sorts moving about and taking in food.



With the invention of such instruments as the microscope and telescope, people found themselves walking between two strange new worlds: one too far off and great, the other too near and small for anyone but the scientist to know much about or do much about. As science developed, thinking people came to feel less and less at home in the universe. They had enough knowledge to become conscious of the need for more.

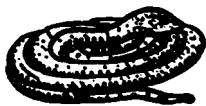
such: like these.

such things: things like these.

surprise: a feeling we have when we see something strange.

Our bodies can be looked upon as machines which are kept going by fuel. As food is burned up in the body cells it gives us heat and other sorts of energy. All through our lives—from birth to death—we must be supplied with energy.

Even when we are sleeping we are using up some food to keep our bodies warm. Our lungs and heart keep on working. Some animals sleep through the cold winter weather: snakes, for example. When they are asleep their rate of breathing and pulse rate and temperature go down, and less food is needed.

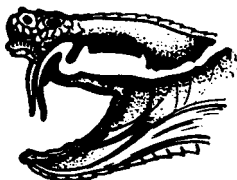


Only animals that can store enough fat in their bodies to keep them alive through the winter can sleep through the months when food is hard to get.

life: time of living.

death: end of living.

snake: a long narrow-bodied animal with no legs. Some sorts of snakes have poison in their long, needle sharp front teeth. If this poison gets into your blood stream it can cause death in a few minutes.



asleep: sleeping; opposite of **awake**.

will sleep

sleep(s)

slept

While our bodies are at rest the large muscles are not in use. It is these large muscles which pull on our bones and let us move as we want to.

Hard work with our large muscles uses up energy quickly so that we come to feel hungry and want to eat.

The more we know about the parts of our bodies and their work, the more new questions come to our minds, questions such as:

How is it possible for all the different parts of us to grow from one cell?

How is it possible for all the millions of cells in our growing bodies to go on doing what they do without our being conscious of their workings?



while: through the time that; in the time when.

hungry: feeling need and desire for food.

will pull

pull(s)

pulled

Through about two billion (2,000,000,000) years, scientists say, the development of plants and animals on our earth has been going on. At first both were very small, much less than a pin point in size. We might say that the first plants or animals were bodies living in one-roomed houses, too small for the eye to see. All the housekeeping went on in one room. Such cells take food in and let waste out. They do not give birth to new cells but divide to become two daughter cells.



These three pictures show the division of a cell into two separate cells, each of which may in turn divide into two more.

much less: a great amount less.

show: make clear, let be seen.

division: becoming two (or more) in place of one.

separate: not together.

divide: make a division; become two or more.

will divide

will show

divide(s)

shows(s)

divided

showed, shown