

### **For thousands of years people have been interested in comets. Why?**

Often because they have been afraid of them; they have thought they were signs of terrible things to come, and they were afraid they might hit the earth. In fact, small pieces of comets do from time to time fall on our earth in the form of meteors, some of which are quite large pieces of solid material. One can see examples of these in some museums.

What is a comet? It is a body that goes round our sun, not in a circle like the planets, but in a kind of egg shape that takes it round our solar system, or in some cases perhaps even outside it, and then back in again. The nearest any comet gets to the edge of our sun during its orbits is about 145,000 kilometres. The shortest orbit is three years, and the longest is likely to be something like a million years. There are thought to be about 120,000 comets in our solar system.

A comet has a head and one or more long tails. What are they made of? Most scientists believe they are frozen gases and dust, but recently there has been another idea, which is that the head is made of organic material in one or more solid pieces.

How did the comets begin? We do not know, any more than we know how our solar system as a whole began.

Why are comets of scientific interest? Because it is likely that they have changed little if at all since they were first formed, so that they could give us interesting information about the beginnings of our solar system, including our earth. If they are made up of organic material, they could also give us valuable information about the beginnings of life on our earth, especially if, as some scientists now think, the small pieces that fall on our earth can lead to organic changes in it.

Two famous scientists have thought for some time that comets bring living things to earth which are the causes of diseases that have started suddenly among people and animals and that have not been able to be explained before. They say that recent discoveries made with very big telescopes and by the spacecraft Giotto have made this idea more likely to be true. But there are other scientists who do not agree. To get proof of who is right, it is likely that we shall have to wait until we have spacecraft that can get much closer to a comet than they have been able to do so far.

#### Exercise 1

Look at these questions. Find the right answers. Then write the questions and the answers:

1. What is one reason why people have been afraid of comets?
  - a) Because they thought they meant that terrible things had happened.
  - b) Because they thought they meant that terrible things were going to happen.
2. What was another reason?
  - a) That they saw examples of them in museums.
  - b) That they thought a comet might fall on the earth.
3. How does a comet go round the sun?
  - a) In a circle, b) In an egg shape.
4. Do all comets stay inside our solar system?
  - a) No. b) We are not sure. c) Yes.
5. Are there differences between the orbits of different comets?
  - a) No, there are not. b) Yes, there are small ones. c) Yes, there are very big ones.
6. What did scientists use to believe comets were made of?
  - a) Dust and gases, b) Organic material.
7. What could we find out from comets if they were made of dust and gases?
  - a) How our own earth began, b) How they have changed since they were first formed.
8. What may we perhaps find out from comets if they are made of organic material?
  - a) The beginnings of life on our earth. b) The beginnings of our solar system.
9. What may have caused some diseases that have started suddenly on our earth?
  - a) Organic material from comets, b) People and animals that have not been able to be explained before.
10. Have we got proof of these things yet?
  - a) No, we have not. b) Yes, we have.

#### Exercise 2

In each of these (pairs of) sentences, fill the empty space with a word that has the same root as the word in *italics*:

1. We can say, 'Because some comets have a very short orbit, we see them quite often' or 'Because of the ... of some comets' orbits, we see them quite often.'
2. Science has taught us a lot about comets. They are of great ... interest to the ... who study them all over the world.

3. It is possible to freeze gases and dust to try to copy the ... material of which comets may be made.
4. People do not usually like dust, because they think that ... places are dirty.
5. We can say, 'We know very little about how our solar system began' or 'We know very little about the ... of our solar system.'
6. We can say, 'What is the value of such information?' or 'How ... is such information?'
7. We have discovered quite a lot about comets recently, but there will be much more important . . . when we have better spacecraft.
8. Is it true that comets are made of organic matter? It is important to know the . . . about such matters.
9. At present scientists do not agree about the material of which comets are made. It would be good if some ... could be reached soon.
10. We can say 'To get proof of who is right, we shall have to get much closer to a comet' or 'To . . . who is right we must get much closer to a comet.'

### Exercise 3

Instead of having a clause as the subject of a verb (e.g. That comets go round the sun is true), it is usual to use it as the subject, and then put the clause after the verb (e.g. It is true that comets go round the sun).

Instead of having an indefinite subject (e.g. a noun with a(n), some, am/ etc.) with the verb to be, it is usual to have impersonal there ... as the subject, and to put the noun with a(n) etc. after the verb (e.g. 'Some fog is between us and the comet' becomes There is some fog between us and the comet').

Put it or there in each space in these sentences:

1. ... is a fact that small pieces of comets fall on our earth;  
... is no doubt about it.
2. ... is probable that ... are about 120,000 comets in our solar system.
3. ... are scientists who think that ... is organic pieces of comets that cause some diseases on our earth.
4. ... are not yet spacecraft that can get close enough to comets to see if ... is true that they are made of organic materials.