

- (b) After the sea tragedy, fishermen in that area, in a gesture of honour to their dead hero, let free any crab shell caught by them which accidentally had a shape resembling the face of a Samurai. Consequently, the particular shape of the crab shell survived longer and therefore in course of time the shape was genetically propagated. This is an example of evolution by artificial selection.

[Note : This interesting illustration taken from Carl Sagan's 'The Cosmos' highlights the fact that often strange and inexplicable facts which on the first sight appear 'supernatural' actually turn out to have simple scientific explanations. Try to think out other examples of this kind].

- 1.7** The industrial revolution in England and Western Europe more than two centuries ago was triggered by some key scientific and technological advances. What were these advances ?
- 1.8** It is often said that the world is witnessing now a second industrial revolution, which will transform the society as radically as did the first. List some key contemporary areas of science and technology, which are responsible for this revolution.
- 1.9** Write in about 1000 words a fiction piece based on your speculation on the science and technology of the twenty-second century.
- 1.10** Attempt to formulate your 'moral' views on the practice of science. Imagine yourself stumbling upon a discovery which has great academic interest but is certain to have nothing to do with the welfare of humanity. How, if at all, will you resolve your dilemma ?
- 1.11** Science, like art, is a human activity, depending on the user. Given below are some examples. Write your views on whether the particular activity is science or art that cannot be so clearly categorised.
- Malaria eradication (as done in India).
 - Television (communication of news and ideas).
 - Prevention of nuclear war.
 - Control of nuclear energy.
 - Put a man on the moon.
 - Development of space technology.
 - Development of chemical and biological warfare).
 - Purification of water.
 - Plastic.
 - Close-up photography.
- 1.12** India has a rich scientific heritage — in mathematics, astronomy, etc. However, in this, several superstitious and obscurantistic attitudes and practices nourished in our society and unfortunately continue even today — among many educated people too. How will you use your knowledge of science to develop strategies to counter these attitudes ?
- 1.13** Though the law gives women equal status in India, many people hold unscientific views on a woman's innate nature, capacity and intelligence, and in practice give them a secondary status and role. Demolish this view using scientific arguments, and by quoting examples of great women in science and other spheres; and persuade yourself and others that, given equal opportunity, women are on par with men.
- 1.14** "It is more important to have beauty in the equations of physics than to have them agree with experiments". The great British physicist P. A. M. Dirac held this view. Criticize this statement. Look out for some equations and results in this book which strike you as beautiful.
- 1.15** Though the statement quoted above may be disputed, most physicists do have a feeling that the great laws of physics are at once simple and beautiful. Some of the notable physicists, besides Dirac, who have articulated this feeling, are : Einstein, Bohr, Heisenberg, Chandrasekhar and Feynman. You are urged to make special efforts to get

access to the general books and writings by these and other great masters of physics. (See the Bibliography at the end of this book.) Their writings are truly inspiring!

- 1.16** Textbooks on science may give you a wrong impression that studying science is dry and all too serious and that scientists are absent-minded introverts who never laugh or grin. This image of science and scientists is patently false. Scientists, like any other group of humans, have their share of humorists, and many have led their lives with a great sense of fun and adventure, even as they seriously pursued their scientific work. Two great physicists of this genre are Gamow and Feynman. You will enjoy reading their books listed in the Bibliography.

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