

ENGLISH BOOK – II

FOR
INTERMEDIATE CLASSES



**PUNJAB CURRICULUM AND
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A few stars are known which are hardly bigger than the earth, but most of them are so large that hundreds of thousands of earths could be packed inside each and leave room to spare; here and there we find an immense star large enough to contain millions and millions of earths. And the total number of stars in the universe is probably something like the total number of grains of sand on all the seashores of the world. Such is the littleness of our home in space when measured up against the total substance of the universe.

These millions of stars are wandering about in space. A few form groups which journey in company, but most of them travel alone. And they travel through a universe so immense that it is very, very rare event indeed for one star to come anywhere near to another. For the most part each star makes its voyage in complete loneliness, like a ship on an empty ocean. In a scale model in which the stars are ships, the average ship will be well over a million miles from its nearest neighbour. From this it is easy to understand why a star seldom finds another anywhere near it.

We believe, however, that some two thousand million years ago this rare event took place, and that another star, wandering blindly through space, happened to come near the sun. Just as the sun and moon raise tides on the earth, so this second star must have raised tides on the surface of the sun. But they would be very different from the little tides which the small mass of the moon raises in our oceans; an immense tidal wave must have traveled over the surface of the sun, at last forming a mountain so high that we can hardly imagine it. As the cause of the disturbance came nearer and nearer, the mountain would rise higher and higher. And before the second star began to move away again, its tidal pull had become so powerful that this mountain was torn to pieces and threw off small parts of itself into space. These small pieces have been going round the sun ever since. They are the planets, great and small, of which our earth is one.

The sun and the other stars we see in the sky are all extremely hot – far too hot for life to exist on them. So also no doubt were the pieces of the sun when they were first thrown off. Gradually they became cooler, until now they have very little heat of their own left, their warmth coming almost entirely from the radiation which the sun pours down on them. In course of time one of these cooling pieces gave birth to life. We do not know how, when or why this happened. It started in simple organisms, whose living power consisted chiefly in their being able to reproduce themselves before dying. But from these humble beginnings came a stream of life which, growing ever more and more complex, has in the end produced beings whose lives are largely centred in their feelings and ambitions, their sense of beauty, and the religions in which lie their highest hopes and noblest desires.

Although we cannot speak with any certainty, it seems most likely that the human race came into existence in some such way as this. Standing on our little grain of sand, we try to discover the nature and purpose of the universe which surrounds our home in space and time. Our first feeling is something like fear. We find the universe frightening because of its immense distances which we do not understand, frightening because of the stretches of time so great that we cannot imagine them, making the whole of human history so very small in comparison, frightening because of our extreme loneliness, and because of the littleness of our home in space – a millionth part of a grain of sand out of all the sea-sand in the world. But above all else, we find the universe frightening because we cannot find any sign that life like our own exists anywhere in it except on the earth. Indeed, for the most part, empty space is so cold that all life in it would be frozen. Most of the matter in space is so hot as to make life on it impossible. Life does not seem to have any part in the plan of the universe which produced our planetary system. Calculation shows that there can be only very few such systems in space. Yet, so far as we can see, life of the kind we know on earth can exist only on planets like the earth. It needs suitable physical conditions for its appearance, the most important of which is a temperature at which substances can exist in a liquid state.

The stars themselves are far too hot for this. We may think of them as a collection of fires scattered through space, providing warmth in surroundings where the temperature is at most some four degrees above absolute zero, that is, about 484 degrees of frost on the Fahrenheit scale. In the immense stretches of space beyond the Milky Way, it is colder still. Away from the fires there is this un-imaginable cold of hundreds of degrees of frost; close up to them there is a temperature of thousands of degrees, at which all solids melt, all liquids boil.

Life can exist only in a narrow belt surrounding each of these fires at a certain distance where the temperature is neither too hot nor too cold. Outside these belts life would be frozen; inside it would be burnt up. A rough calculation shows that all such temperature belts, within which life is possible, all added together, make up less than a thousand million millionth part of the whole of space. And even inside them, life must be very rare, for it is extremely unusual for suns to throw off planets as our sun has done. Probably only one star in 100,000 has a planet going round it at the right distance for life to be possible on it.

NOTES

Words Explained:

- pack :** put into box, parcel, etc.; put things into box, etc., get or become crushed into small space. I must pack my suitcase (fill with articles) before the taxi comes to take me to the station
- spare :** do without, let another have, give what is not needed. She told the robber to take her money but to spare (not to take) her life. Can you

spare the beggar a rupee? We have a spare bed for visitors. Have you a spare shirt to lend me?

- average :** number got by the addition of separate numbers and division of this by a number of such numbers; what is normal or representative. His work is about average, or below or above average
- rare :** seldom, not often
- radiation :** giving out rays of light or heat; coming out as rays in all directions from middle point
- organism :** living body having parts dependent upon one another
- reproduce :** increasing number of one's sort by having offspring
- complex :** not simple, hard to get clear or straight complex machinery, complex argument, complex sentence
- planetary :** of planets; planet, a star moving round the sun
- space :** that in which all physical things have their being. A space of hundred yards. We should have enough space between the houses. In open space.
- calculation :** something worked out by mathematics; decision as to effect event, by balancing reason, etc. a calculating machine; a rough calculation
- Milky Way :** the galaxy, the shining countless stars and nebulae stretching across the night sky

ANSWER THESE QUESTIONS

1. How is it that a star seldom finds another star near it?
2. What happened when, according to Sir James Jeans, a wandering star, wandering through space, came near the sun?
3. What happened when the wandering star came nearer and nearer?
4. What are planets and how did they come into existence?
5. Why is there no life on the stars?
6. Write a note on the beginning of life on the earth.
7. Why is the universe, of which our earth is a part, so frightening? Give as many reasons as you can.
8. What, in your opinion, should be the conditions necessary, for the kind of life we know to exist on other heavenly bodies? Do such conditions generally exist?
