

Episode 15

CHANGING FORMS of ENERGY

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Vasudha: Manav...Manav... Manav, where are you?

Srishti: mummy, Manav is with buaji, listening to story.

Vivek: Mummy, since buaji has come here, Manav is addicted to hear stories.

Vasudha: Manav's story listening is better than listening F.M. Radio throughout the day.

Srishti: yes mummy, now I can listen my favorite program because Manav is busy with stories.

Vivek: Its good, not only he, Srishi too is fond of F.M.

Srishti: bhaiya not only me and Manav, mummy also listens F.M. while cooking food.

Vasudha: Oh I forgot .I was calling Manav for breakfast. Vivek go and call Manav .

Call buaji also.

Vivek:

Yes, Yes, I will do it.

[Sound of Vivek's departure]

Srishti: mummy, today pappa is coming early from the office. Isn't it?

Vasudha: yes Srishti.

[Sound of departure of Manav, Vivek and buaji]

Vasudha: Came didi sit. I Hope Manav is not bothering you.

Buaji: Oh no Vasudha .My dear nephews Manav never bothers me rather he cares for me.

Srishti: It is because you have lots of stories for him. Isn't it Manav?

Manav: didi, who has stopped you? You can also enjoy buaji's story.

Vasudha (loudly): breakfast is ready...

Manav: very fast mummy, it's really too early for breakfast.

Vasudha: breakfast is prepared at its usual time. Perhaps you might have not realized the time in listening stories.

Manav: mummy when buaji tells the story, then what of time, I forget about the hunger too.

Vivek: Srishti he is not praising buaji but to the stories she use to tell him.

Vasudha: however didi, which story were you telling to Manav?

the story Srishti didi, today buaji told me about a miracle.

Srishti: miracle! then buaji we would also like to know about it.

Vivek: Srishti, you too are behaving like Manav, and bowing to the false miracle.

Srishti: Vivek bhaiya I am not bowing to actually I want to know about it.

Vasudha: however children there are nothing like miracle in today's scientific world. Yes for sometime it can be an illusion to our eyes

Buaji: Oh no Vasudha, the miracle which I was telling about is an incident in front of my eyes.

Manav: Buaji's eyes can not be duped.

Srishti: then buaji please tell us about that miracle.

Buaji: Vivek, do you know your fufaji was ill for a long time period.

Vivek: yes buaji, I remember the condition of fufaji was serious due to some illness five-six years ago.

Buaji: Right Beta and your fufaji got well by a miraculous bhabhoot at that time.

Srishti: miraculous bhabhoot, from where had you received that miraculous bhabhoot?

Buaji: a saint with magical powers came to our village that time. I told him about my problem and he began to enchant mantras by waving his hands towards the sky.

Vivek: and then the miraculous bhabhoot might have appeared in his hand.

Buaji: O yes, amm... (Confused) But Vivek, how do you know this? I hadn't told this to anyone before.

Srishti: buaji our Vivek bhaiya is also miraculous .He has also attained some magical powers (Laughter).

Manav: is it true Vivek bhaiya . Is Srishti didi telling the truth?

Vivek: Manav it's not like that. In fact these type of false tales are frequently heard in our country, But the reality is that a charlatan by his leger demain with the use of some chemicals and some formulas of science dupes the innocent people and grabs profit from them.

Buaji: it's true, that he charged a large amount of money for that miraculous bhabhoot, but dear Vivek your phuphaji got well by that only.

Vasudha: no didi the truth is that bhai sahab recovered because of treatment he was getting. You might have known that he stayed here with us for a month. At that time a minor heart operation was conducted. He also took a loan for this. He didn't tell you as he didn't want to get tensed.

Buaji: so this was the truth and I being unaware of all these facts and sang the helm of the miraculous bhabhoot.

ji no other thing except the sunlight comes to this earth from outside.

Manav: No, there is another thing. You forgot the rain from the sky.

Srishti: Manav tell me from where does the water come to the sky?

Manav: it's simple the sky receives water from the clouds.

Vivek: and Manav, from where does the cloud comes?

Manav: (Confused) er.. The clouds also come from the sky.

Vasudha: Manav the clouds are formed by the vapors, which in turn are formed by heating the water of the earth.

Vivek: Manav, now tell from where does the rain water come?

Manav: now I understood bhैया rain water is also the another form of earth water.

Buaji: then, dear Vivek is right that no other thing comes to the earth from outside except sun's energy.

Vasudha [laughing]: children enough are talking, should I serve the breakfast?

[Clinging of plates.]

Srishti: why to wait for the good work now?

Manav: mummy what's there in the breakfast today?

Vasudha: ripened gram and moong together with custard.

Buaji: Vasudha, you have made nutritious food for children.

Vasudha: didi they will be healthy if they take nutritious food from the.

Vivek: [laughing]: we all will become champion by eating the food prepared by mummy.

Buaji: Vasudha, the food is very delicious. I had full and I am feeling sleeping now.

Manav: buaji, do you remember your promise to tell me another story today.

Srishti: Manav, complete your homework first, and then only you can hear story.

Buaji: yes Manav, I'll tell you the story at night. Till then you must complete your homework.

[Music]

[Sound of the turn of pages.]

Srishti: Manav, why are you turning the pages of your book? Aren't you able to concentrate in your studies?

Manav: no didi it's not so.

Vivek: Manav what the matter, are you not able to understand.

Manav: yes Vivek bhैया. I'm unable to understand the closed system nature of the earth. You told that nothing come from outside to this earth except the sunlight that means this earth has

like them?
like them?

Vivek: Have you read anything about this subject before?

Manav: No.

Srishti: bhaiya, it seems that we have to tell him everything from the beginning

Vivek: Manav earth is not selfish. It is apart of the solar system. Its system has some fixed measures.

Manav: What do you mean by fixed measures?

Vivek: It means that our earth doesn't feel only effect of the other planets of solar system or any other heavenly body of the universe.

Srishti: if only receive the energy from earth. This way it has developed like a closed system.

Manav: It means the weight of the water; minerals would be constant, or better to say the weight of the earth would also be nearly constant.

Vivek: Yes It's something like this only. The total mass of the earth does not change. Yes it can change its form.

Srishti: we can take the example of trees, as the plants grow in their shape and size by receiving the CO₂, water and minerals from their surrounding.

Vivek: but on decaying they liberate CO₂, water in the environment and the minerals go to the soil. It means the mass of the earth is unchanged.

Manav: but bhaiya, some days back I heard in news that some pieces of meteors fall on earth.

Srishti: but Manav, such cases are exceptions and meteors had fallen long back, and their contribution on earth man is negligible.

Vivek: and Manav the properties of closed system are specific as our earth is also specific

Srishti: Right Vivek bhaiya, the atmosphere, the lithosphere, the biosphere makes our earth unique, where the different elements of earth are recycled.

Manav: bhaiya, by biosphere do you mean the place where all the living organisms are found.

Vivek: yes Manav biosphere is that region of the earth where the life is found.

Manav: Bhaiya can I make an artificial biosphere and which will as suitable for living. There I will grow fruits and vegetables and eat them. I will not get scolding from didi

Vivek: It's not that much easy, Manav over biosphere is the result of many systems working together in which many biotic and abiotic components have got their own importance.

Srishti: Vivek bhaiya, this type of experiment, which Manav is talking, was performed by America.

Vivek: Srishti it was an experiment Biosphere2 by which it was tried to recognize the earth as a closed system.

is it named Biosphere2?

Vivek: because till now from the known information earth is the only planet where life is possible and is called biosphere1. therefore that model would be Biosphere-2 only

Srishti: Manav, this novel experiment was performed in 1987 to 1991

Vivek: the space chosen for this experiment was equal to the size of 2.5 football ground. A green house was constructed over it and 8 people who included doctors, scientists and researchers stayed there for 2 years

Manav: bhैया, I have seen small laboratories in school. But for the first time I heard it for the first time that such a large area is used for any experiment.

Srishti: Manav, the main objective of this experiment was also to understand the specific working system of the planet earth

Vivek: Manav the artificial closed system Biosphere-2 also included Mangrove trees together with Coral Reef and pastures of grassland, sea and deserts.

Manav: It means that it was a trial to establish a different subsystem of earth on this earth.

Vivek: yes Manav farming was also done in Biosphere 2. Bananas and groundnuts etc. were grown and different types of organisms, animals were also kept here.

Srishti: Manav [human being] tried to repeat a second earth's model in Biosphere 2 model.

Manav: me! I was not born also at that time, then how could I do such an odd experiment.

Vivek: O Manav, Srishti meant that is human civilization by it.

Srishti: only sunlight was entering from outside in this experiment, the rest of the materials were produced and destroyed within it only.

Vivek: but after sometime the level of oxygen starts falling in this artificial system.

Manav: But you said some trees and plants were also grown to maintain the balanced amount of oxygen in this experiment. Then how the amount of oxygen got reduced?

Srishti: the micro-organisms present in the soil were neglected in this experiment, therefore the amount of oxygen consumed by micro-organisms was not calculated, and it was the main reason of its shortage and also level of carbon dioxide started increasing because of microbial activity.

Manav: but bhैया what was achieved from this experiment.

Vivek: Manav, the closed system nature of the earth and the process of recycling was understood more closely with this experiment it was also clear that the life on the earth is the result of different fragile balances.

Srishti: and it might also be possible for the scientist to test the possibility to establish the human colony in space with this experiment.

Suryaprakash: what experiment is going on children?

Vivek: Nothing papa. We were trying to explain Manav, the behavior of earth like a closed system

Manav: now it's the turn to test you papa. Today you were about to take us on a walk near Lake

Suryaprakash:

yes children I came here to tell you that only. Now get ready.

Manav: papa will mummy and buaji accompany us?

Srishti: Manav they both said no, they want to purchase something from the market.

Suryaprakash: children I'm waiting outside. Get ready and come soon.

[Music of the change of the scene.]

Srishti: papa it is very pleasant to come near the lake.

Suryaprakash: yes child the blowing breeze and the beauty of lake provides the freshness.

Manav: bhaiya, these all are the parts of the closed system of the earth.

Vivek: yes Manav our environment including the oceans, together with the atmosphere, the biosphere is the part of the closed system of the earth.

Suryaprakash: children there is a deep relationship between the ocean and our environment.

Vivek: yes papa, the energy and nutrients distribution taking place because of Oceanic movement.

Manav: bhaiya, how can it be possible to distribute the energy between the environment and the ocean as the ocean contains an immeasurable quantity of water. Then how is the energy distributed in it.

Srishti: Manav, the water in the earth keeps on evaporating by heat of the sun and mixes in the atmosphere.

Suryaprakash: Manav in this process a large amount of sun's energy goes in to the ocean.

Manav: so this is why the oceans are also called the storehouse of sun's energy.

Vivek: yes Manav, a large amount of sun's energy is stored by the oceans. According to an estimate the energy required for the evaporation of water in every square km. of land near the equator is nearly ten lacs horse power.

Suryaprakash: Manav according to an estimate nearly one meter of water from the ocean reaches to the environment every year.

Srishti: and finally these steams get converted to water after sometimes.

v, finally we get two benefits when these vapor reaching into the environment.

Manav: which two benefits?

Vivek: when the steams are formed water vapor from the ocean spreads in the atmosphere, thus the heat from ocean is transferred to atmosphere and the second benefit is the heat accumulation in the atmosphere due to this steam.

Srishti: yes the heat contained in the steam spreads in the atmosphere and we have winds blowing, across our planet.

Suryaprakash: it is this specialty due to which the steam is known as the source of the heat of the environment.

Manav: now I have understood that there is a close relationship between the environment and the ocean. I have also understood that on earth water transfers into steam by energy and then steam is again converted into water.

Vivek: so Manav, you must have understood the effect of ocean on our atmosphere.

Manav: yes bhaiya, I got it. Bhaiya what are the benefits of the ocean and environment movement on life.

Suryaprakash: Manav, abundance amount of the elements of minerals are carried by the rain and river water in the ocean every year.

Vivek: many trees and living organisms living in ocean depend on these elements.

Manav: it means the different elements going from earth to the ocean are necessary for the marine life.

Suryaprakash: Manav not only for the marine life but indirectly these elements create the necessary environment for life on the earth too.

Manav: how does it do so?

Vivek: Manav an abundant quantity of various elements reach the ocean through rivers from land, thus maintaining the saltiness in the ocean.

Manav: but what's the importance of saltiness of ocean to us?

Suryaprakash: Manav the movements in the ocean are also caused by the amount of salt in it.

Manav: so because of these movements, the boat and ship float in the ocean thus reducing the consumption of fuel.

Srishti: Excellent Manav, that's really brilliant, thought.

Manav: thank you, thank you, I know that, I am really brilliant.

Vivek: Actually due to the increase in saltiness of ocean, the water in it reaches a great distance because of density different and thus the ocean play their role in the conduction of temperature on earth.

es Manav If Oceans are stationary, that is without any movement, then some region on earth will become extremely hot and some cold. In such conditions there will be a limited area on earth which will be suitable for life.

Manav: but bhaiya, due to the mixing of minerals and other elements in ocean, the saltiness in ocean will increase rapidly.

Vivek: Manav, environment has produced such a system that the minerals in the ocean are utilized by the flora and fauna and manav is also trying to extract many elements like iron etc from sea.

Manav: bhaiya, you are taking my name Manav but you actually mean man who, is using sea resources for his own welfare. It's amazing, perhaps miracle I'm here also and there also...

Srishti: Manav. You got it right Vivek bhaiya is talking about the whole human society.

Manav: but still didi, bhaiya is telling about the extraction of metals from water. Buaji too told me a tale of a sage who converted the silver jewelry to gold by dipping them in water.

Suryaprakash: O' Manav it might be the work of a charlatan. They befool the innocent people for the money.

Vivek: papa today we have also explained Manav at home that some clever people with their leger demein convert a thing to another and claim to make them.

Suryaprakash: dear children, no other thing except the solar energy comes to this earth from outside. Every material is created and destroyed within this earth. The material changes their forms only. You have to verify different activities by keeping this fact always in mind.

Vivek: our conversation produced dual effect. At one side Manav came to know some special facts about the earth and on other he learned the truth behind miracles.

Manav: yes papa now I clearly understood that there is nothing like miracle and I will tell this to buaji also at home.

Srishti: wow! Now Manav, who was in the effect of miracles will now tell their truth to the society and will now contribute to the spread of scientific awareness.

[Everyone smiles]