

Where's Away ?

Mamata Pandya



A Centre for Environment Education Publication
for South Asia Co-operative Environment Programme





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About the Project

This book is one of a series of four books for children on environment-related themes. The series was commissioned by South Asia Co-operative Environment Programme (SACEP). The books have been developed and produced for SACEP by Centre for Environment Education, India.

Centre for Environment Education (CEE) is a national institute of excellence for Environmental Education supported by the Ministry of Environment and Forests, Government of India and affiliated to the Nehru Foundation for Development. The main objective of CEE is to create environmental awareness among children, youth, decision makers, and the general community. CEE develops innovative programmes and materials and field tests them for their validity and effectiveness. The aim is to provide models that could be easily replicated to suit local conditions.

CEE is also the Subject Matter Area Focal Point for Environmental Education as designated by the Government of India and approved by the Governing Council of SACEP.

South Asia Co-operative Environment Programme (SACEP) is an Intergovernmental Organization of 9 South Asian Countries namely Afghanistan, Bangladesh, Bhutan, India, Iran, Maldives, Nepal, Pakistan and Sri Lanka. It was the culmination of two years of deep deliberations by the concerned countries on the feasibility of regional co-operation on environmental oriented development activities. It became a legal entity in 1982. SACEP is also the only specialized institution in South Asian Region concerning the formulation and implementation of Environmental Projects and Programme Activities.

Where's Away ?

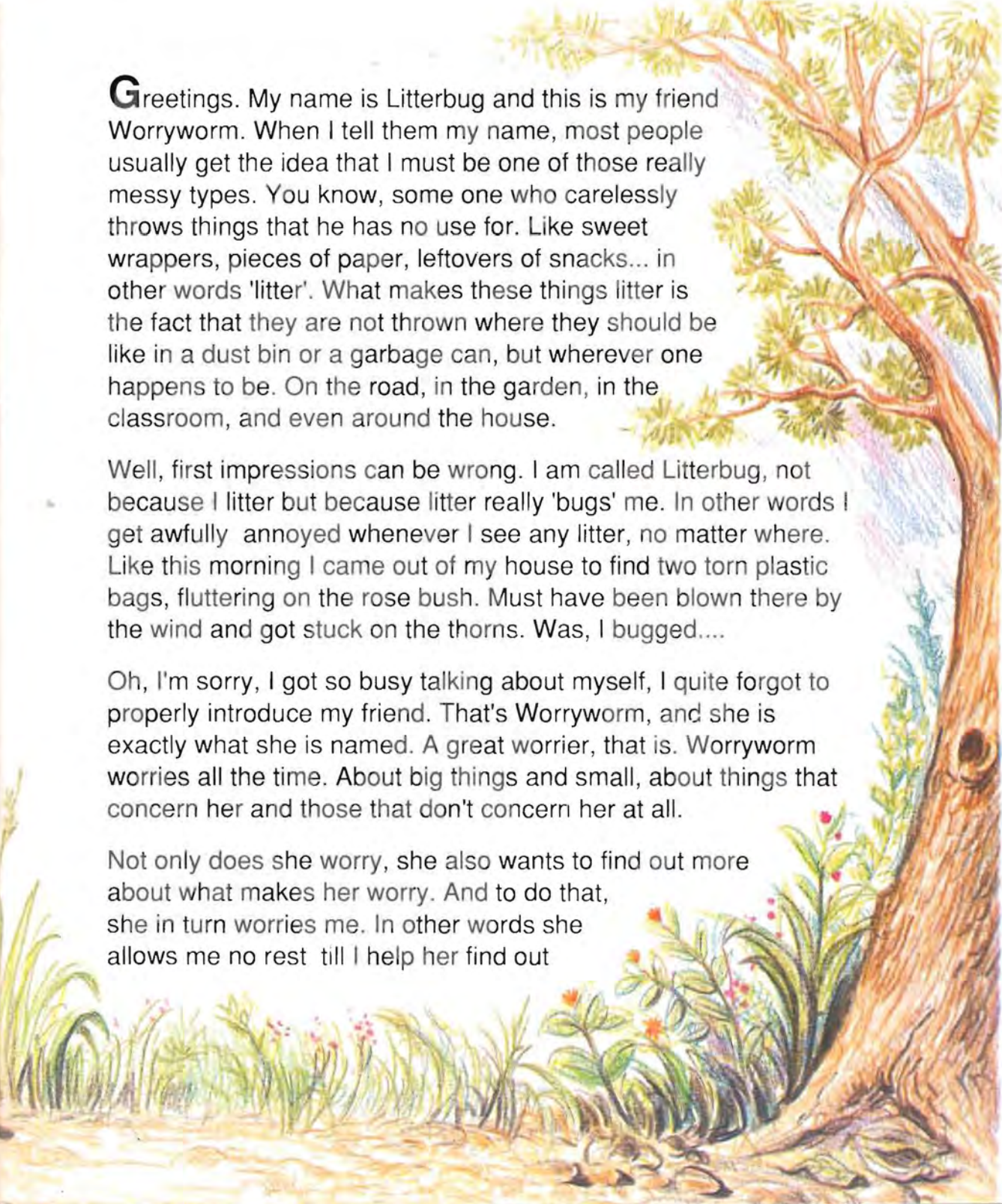
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Greetings. My name is Litterbug and this is my friend Worryworm. When I tell them my name, most people usually get the idea that I must be one of those really messy types. You know, some one who carelessly throws things that he has no use for. Like sweet wrappers, pieces of paper, leftovers of snacks... in other words 'litter'. What makes these things litter is the fact that they are not thrown where they should be like in a dust bin or a garbage can, but wherever one happens to be. On the road, in the garden, in the classroom, and even around the house.

Well, first impressions can be wrong. I am called Litterbug, not because I litter but because litter really 'bugs' me. In other words I get awfully annoyed whenever I see any litter, no matter where. Like this morning I came out of my house to find two torn plastic bags, fluttering on the rose bush. Must have been blown there by the wind and got stuck on the thorns. Was, I bugged....

Oh, I'm sorry, I got so busy talking about myself, I quite forgot to properly introduce my friend. That's Worryworm, and she is exactly what she is named. A great worrier, that is. Worryworm worries all the time. About big things and small, about things that concern her and those that don't concern her at all.

Not only does she worry, she also wants to find out more about what makes her worry. And to do that, she in turn worries me. In other words she allows me no rest till I help her find out

the answers ...Well, at least some answers, or even part of an answer. After all, not all the questions she worries about have simple or single answers!

But there you are, with me getting bugged and she getting worried, you must think we'd be a boring, sad, dismal pair of friends. Well you'd be surprised to learn that we do have a lot of fun trying to find out answers to her questions and solutions to her problems. We look for clues, try to trace the clues, and to discover many new things. Almost like being detectives.

Let me tell you about some of our adventures.

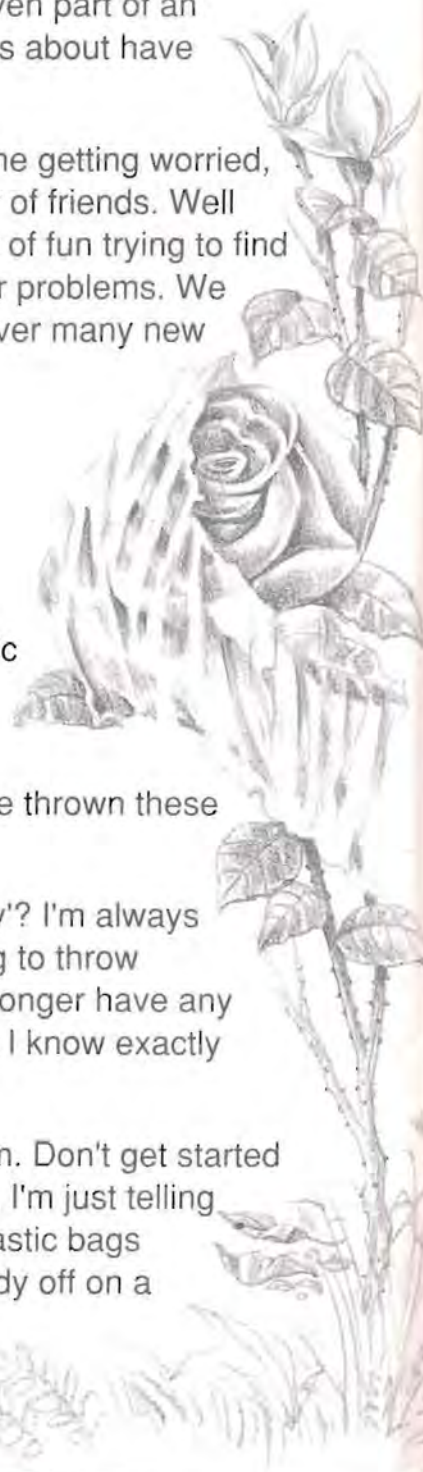
On the Waste Trail

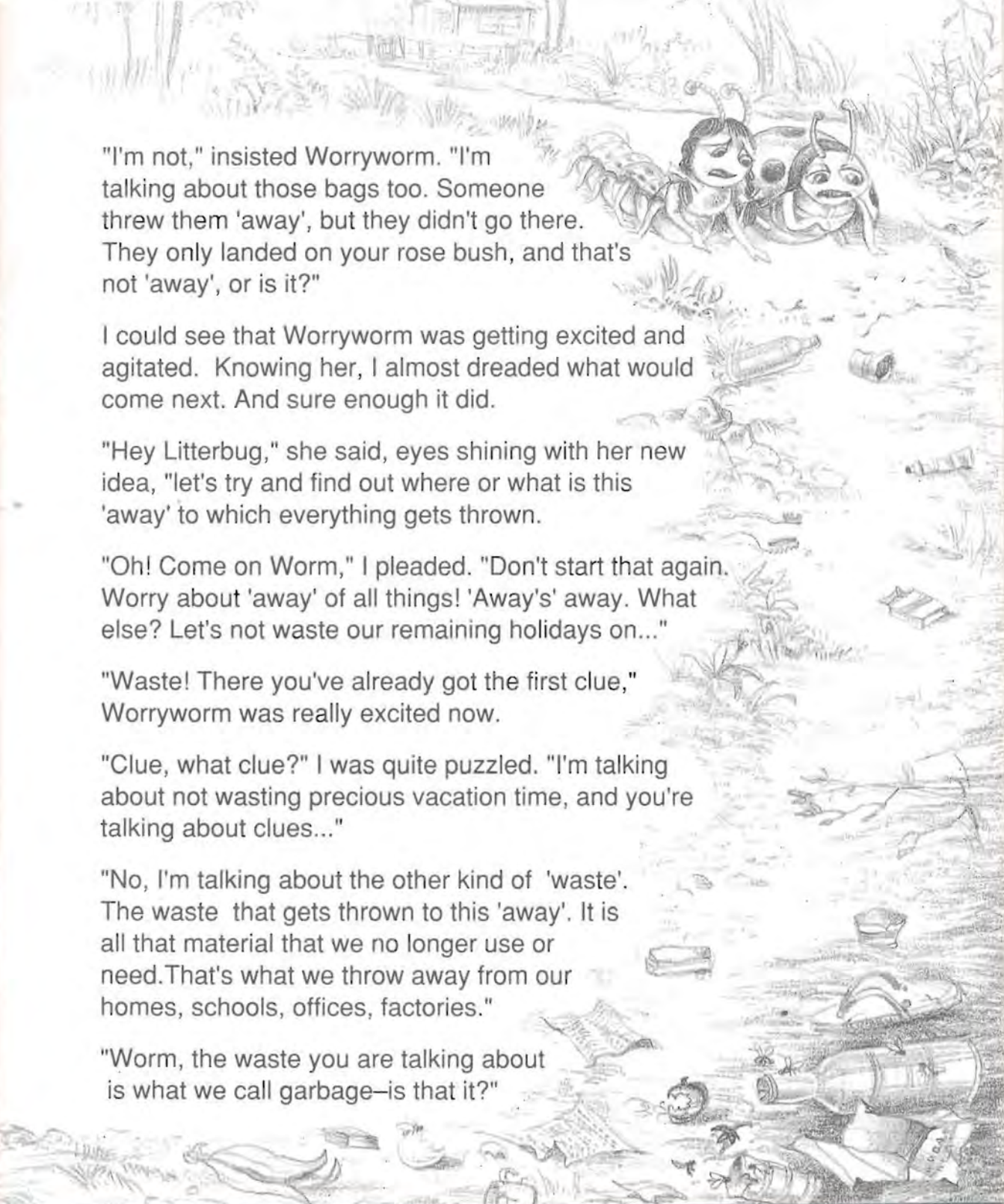
I began to tell Worryworm about how those plastic bags on my rose bush bugged me as soon as I stepped out of my house.

"Some careless litterbug, the real type, must have thrown these away, I'd like to..."

"Away," piped up Worryworm "What is this 'away'? I'm always hearing people say they are going to throw something away, when they no longer have any use for it. But I'm not at all sure I know exactly what they mean by away."

"Come on, Worryworm. Don't get started on a new worry now. I'm just telling you about those plastic bags and you are already off on a new worry trip."





"I'm not," insisted Worryworm. "I'm talking about those bags too. Someone threw them 'away', but they didn't go there. They only landed on your rose bush, and that's not 'away', or is it?"

I could see that Worryworm was getting excited and agitated. Knowing her, I almost dreaded what would come next. And sure enough it did.

"Hey Litterbug," she said, eyes shining with her new idea, "let's try and find out where or what is this 'away' to which everything gets thrown.

"Oh! Come on Worm," I pleaded. "Don't start that again. Worry about 'away' of all things! 'Away's' away. What else? Let's not waste our remaining holidays on..."

"Waste! There you've already got the first clue," Worryworm was really excited now.

"Clue, what clue?" I was quite puzzled. "I'm talking about not wasting precious vacation time, and you're talking about clues..."

"No, I'm talking about the other kind of 'waste'. The waste that gets thrown to this 'away'. It is all that material that we no longer use or need. That's what we throw away from our homes, schools, offices, factories."

"Worm, the waste you are talking about is what we call garbage—is that it?"

I finally made the connection.

"It's also called by other names—trash, refuse, junk, rubbish, scrap..." Worryworm never could resist showing off how good she is at language.

"I don't care what it is called, I don't like it, no matter where. I'm not called Litterbug for nothing."

"All the more reason to find out where all this, whatever you want to call it... comes from and where it goes," said Worryworm.

Without realizing it, I found myself getting involved in Worm's project. By now she was itching to go. "Come on, Bug, let's start our search at home."

"Why at home? It is easy to know where things we don't need go. Into the garbage can."

"You really do catch on fast, Bug. That's the first place to look." And Worm plunged right into the garbage can, pulling me along with her.

Cuca's Kitchen

Yucch ! What a dark, smelly place it was. And what funny sensations we got. The feel of hard and cold metal made us shiver, the crinkle of paper rubbed against us, we felt the damp smoothness of vegetable peels and fruit leftovers, and the icky mush of leftover food and tea leaves.



Trust Worm to get us into such a mess. And imagine my state. I, the Litterbug who can't stand even a sweet wrapper lying around.

"Well, well, visitors at last." Suddenly we heard a voice from the dark and damp depths.

"Hardly on a pleasure trip," I gasped. "Who are you and where are you anyway?" My eyes still hadn't adjusted to the sudden plunge into the dark can.

"La Cucaracha's the name. That's the word for cockroach in Spain. Welcome to my home ground; that's this garbage can and around."

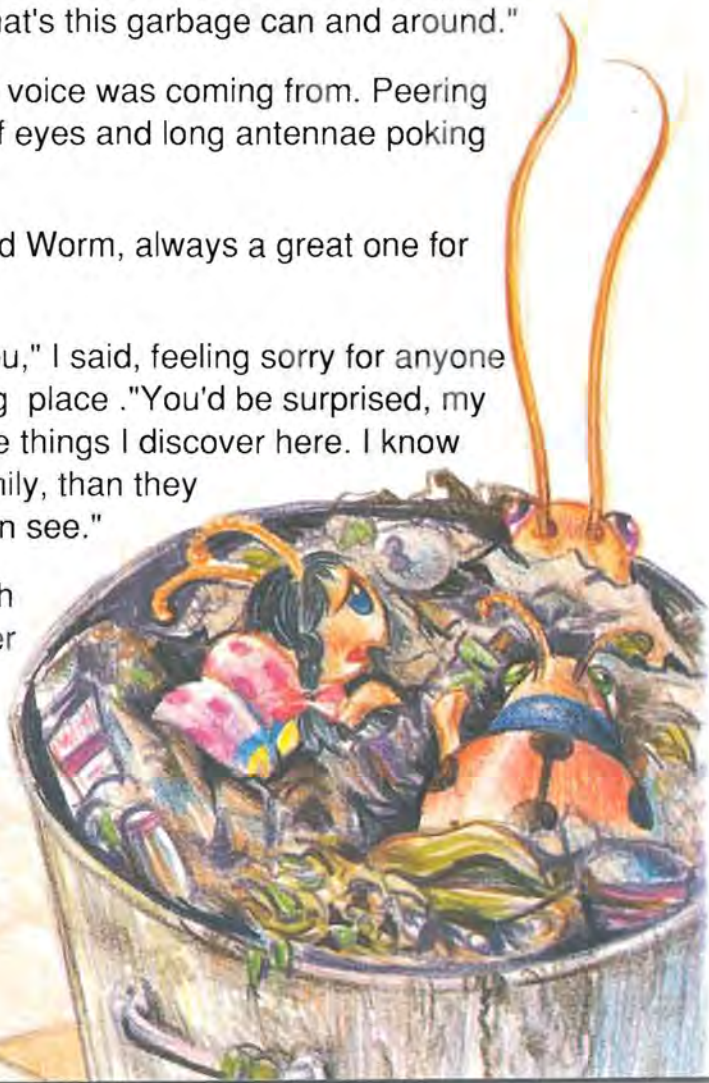
We just about located where the voice was coming from. Peering hard we could make out a pair of eyes and long antennae poking through the mess in the can.

"Pleased to meet you, Miss," said Worm, always a great one for good manners and all that.

"Couldn't be much of a life for you," I said, feeling sorry for anyone who had to live in such a stinking place. "You'd be surprised, my dear," said La Cucaracha, "at the things I discover here. I know more about the habits of this family, than they themselves or others like you can see."

"But you couldn't be seeing much of the family," said I. "All you ever see is what gets into this garbage can."

"That's what reveals this family's taste. And tells me exactly what they eat, drink and waste," said Cucaracha.





I could see that La Cucaracha was feeling very smug about the air of mystery she had created with her cryptic comments.

"The cans, the bottlecaps, the foil and cellophane The bags inside boxes, more packaging than what's within," she continued.

"And how do those tell you about the family and its habits"? I asked.

"They throw out a lot, is that what you've discovered?" asked Worm.

"A lot that they throw is because they don't know, that much of this stuff has nowhere to go. But they keep buying things they don't always need. In all kinds of containers with packaging neat. Then the plastics, foils and tins they just chuck, not thinking where they all end up, just leaving it to luck."

"I suppose they'd have to throw all that away," I murmured. "What could they do with all that anyway?"

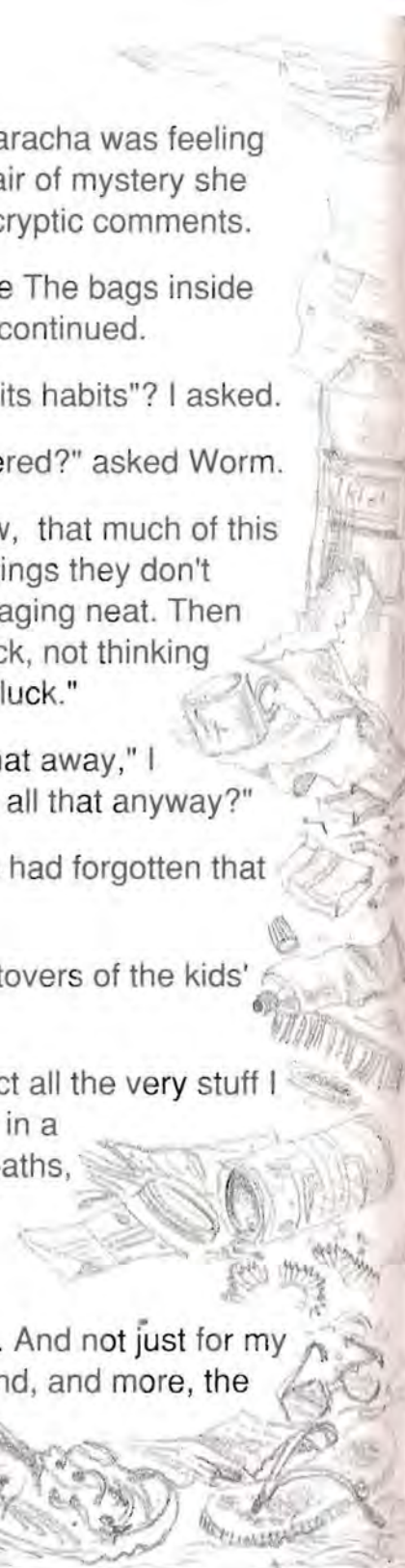
Cucaracha continued her chant, almost as if she had forgotten that we were there.

"Peels and egg shells, tea leaves and bones, leftovers of the kids' dinners that are thrown."

"That's really a lot of rubbish," I shuddered. In fact all the very stuff I disliked so much, especially when it wasn't even in a garbage can, but strewn all over the roads, footpaths, gardens, and parks.

"May be rubbish to you, but it's a treat for me.

"When they leave the lid open its a feast for free. And not just for my clan, but even the Fly family. Enough to go around, and more, the rottener the better, we enjoy it for sure.



"I still remember how I nearly starved when I lived next door with that family proud."

"Why was that?" asked Worryworm. "Did they not have a garbage can?"

"A garbage can they had, its true. But things that went in were very few." La Cuca was talking in riddles now. I couldn't understand. I thought every household had to throw away all the things that La Cuca was thriving on in her garbage can. "How could that be?" I wondered aloud.

"That is not for me to tell, but for you to find out. Just go right across and clear your doubt."

And La Cucaracha disappeared into the depths of the garbage can, leaving much of the mystery unsolved.

"Come on, Litterbug, let's move to our next investigation," urged Worryworm pulling me out of the can. Phew! was I glad to be out of that dump. But I didn't see how hopping from can to can was going to get us any closer to discovering what we were looking for, and that was 'away'. I said so to Worryworm.

"You always want the answer in the first chapter," she snapped. "What's the fun of an investigation if you are not adventurous?"

"What's so adventurous about meeting a cockroach who talks in riddles and verse? And being buried in garbage? What did we learn from that?"

"We learnt about what kind of things get thrown into garbage cans. What we will try to find out now is why the next door garbage can is





different from the one we just visited. Come on, let's just jump the fence and see what we find."

And before I could protest any further, Worryworm was dragging me out of the house, over the fence, and right into the house next door.

Commander Takes Charge

We walked in through the door that someone had left open and headed straight in the direction of the kitchen.

How did we know where to go, you may wonder. We had never visited this house before. You may say we just followed our nose. Noses, on bugs and worms? Aha! Fooled you, didn't I? No, we just crept towards the room from which yummy smells were drifting out. Someone was cooking up some real goodies. Made my mouth water. After that recent encounter with that horrid, stinky, rotten mess next door, the smells were heavenly. Cucaracha may enjoy her stinks and smells, but give me a nice deep breath of home cooking any day.

So lost was I in all these smelly thoughts I didn't realize that Worm and I had reached the kitchen door. Just as we were about to step in, we suddenly heard a strident command. "Halt," it said "Who comes into my territory?"

We halted abruptly, not so much in response to the order, but out of sheer surprise at this voice out of the blue. We looked carefully across the nice clean floor but could not see anyone or anything to which the voice could belong.

'Who are you, and what brings you to these parts?' the mysterious voice came again. This time we realized that it was coming from quite close. We turned slightly and came face to face with two bristling antennae, attached to a dignified ant standing at attention in the joint where the floor met the wall.

"Oh! Excuse us, sir," stammered Worm. "We didn't mean to intrude." "Commander Ant at your service miss. Just making sure no undesirable aliens try to creep into my home range."

"Yes sir, no sir," said Worm, still quite shaken. "We are just a pair of friends trying to find out a few things. We were on our way to looking into the garbage can here."

"That's very suspicious," the Commander said gruffly. "Why would any one want to indulge in such a pastime? Besides, you still haven't identified yourselves. I've a good mind to hand you over to my army."

I decided it was time to step in. "Wait a minute, Commander. Let me explain. My name is Litterbug and this is my friend Worryworm. We are in search of a place called 'away'. We were told to come here by someone next door."





I rattled all this off in one breath, still a bit scared of the Commander, and of his army too.

"Just what do you mean? What's all this talk about 'away' and next door; and what does it have to do with this place?" The Commander was getting impatient, we could see.

I tried again. "You see, sir, Worryworm and I are in search of this place called 'away'. That's where everyone throws things they don't want or use or need. We often hear people talk about throwing things 'away' into a dustbin or garbage can, so we thought we would start by looking at some..."

"And we looked at the one next door sir," gushed Worm. Now that she had recovered from her fright, she was back to her usual self. "A really messy one it was too. We also met the resident cockroach there. She recommended we visit here, sir, to see the difference sir, although she said she wouldn't give up her present place for any other, sir."

"A wise choice too, I dare say. Let her dare come to these parts and I'll set my army on her likes," bristled the Commander, getting quite sidetracked by visions of organizing an army ant attack on any alien who dared come into his area of command.

"If you will excuse us, Commander," I said "Worm and I will be getting on with our investigations of the garbage cans."

"Hmph," said Commander Ant. "You are in my territory, and now that I know your mission, it is my duty to see that my army and I help as best as we can. Which brings me to the object of your mission, the garbage can. Let me inform you that in this house, that's where you will find the least clues."



"But garbage cans are supposed to provide the best clues in this case," interrupted Worm. She couldn't bear to think of a clueless mystery, especially when we were just beginning. "Besides, the cockroach next door assured us that the contents of this can would be different. She didn't say it wouldn't have anything..."

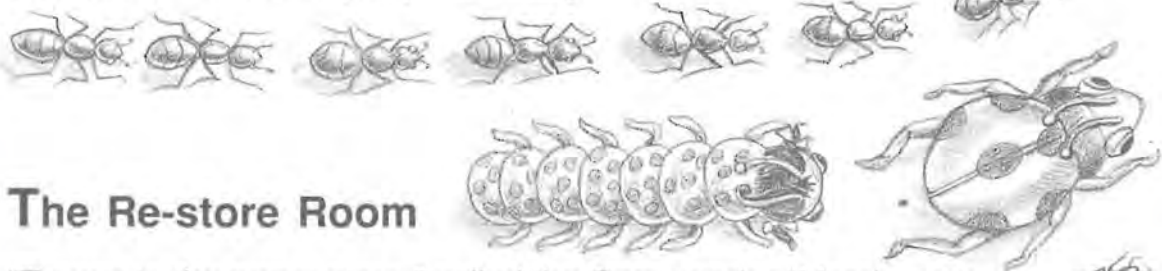
"Patience, miss," chided the Commander. "I am only trying to help. When I say no clues in the can, I don't mean no clues at all. Tell me what you expect to find in the can and I'll show you where to look."

"Well, paper, plastic, bottles, tin cans, you know things that things come wrapped in; and of course all the things that get thrown from the kitchen, like used tea leaves, egg shells, vegetable peels, even leftover food." I was trying my best to remember what we had found in the last garbage can.

"Hmph, hmph," said the Commander. "I will provide you with an escort, and some of my intrepid soldier ants will be at your service to help you with finding answers to these questions."

Before we could react, he had saluted smartly and called his army to order. "Attention army!"

Instantly an orderly line of smart black ants started marching out of an almost invisible crack nearby. They lined up on either side of us. Our escort party was ready.



The Re-store Room

"Troops to the paper store," called the Commander "March, now. Hup, two-three, hup, two-three ..."



Soon we found ourselves facing a neat stack of newspapers, single sheets of used paper, old notebooks and magazines.

"This family rarely puts paper in the dustbin," explained one of the soldier ants accompanying us. "All the paper that has been used is collected here and every month or so, the lady of the house sells it to a person who buys old paper, tins, plastic bags, etc."

"But what happens to all of that later?" worried the Worm. "I'm sure that man who takes it away goes and throws it all somewhere."

"Now why would someone want to pay money just for collecting something to throw away?" I wondered aloud. "That does not sound quite right."

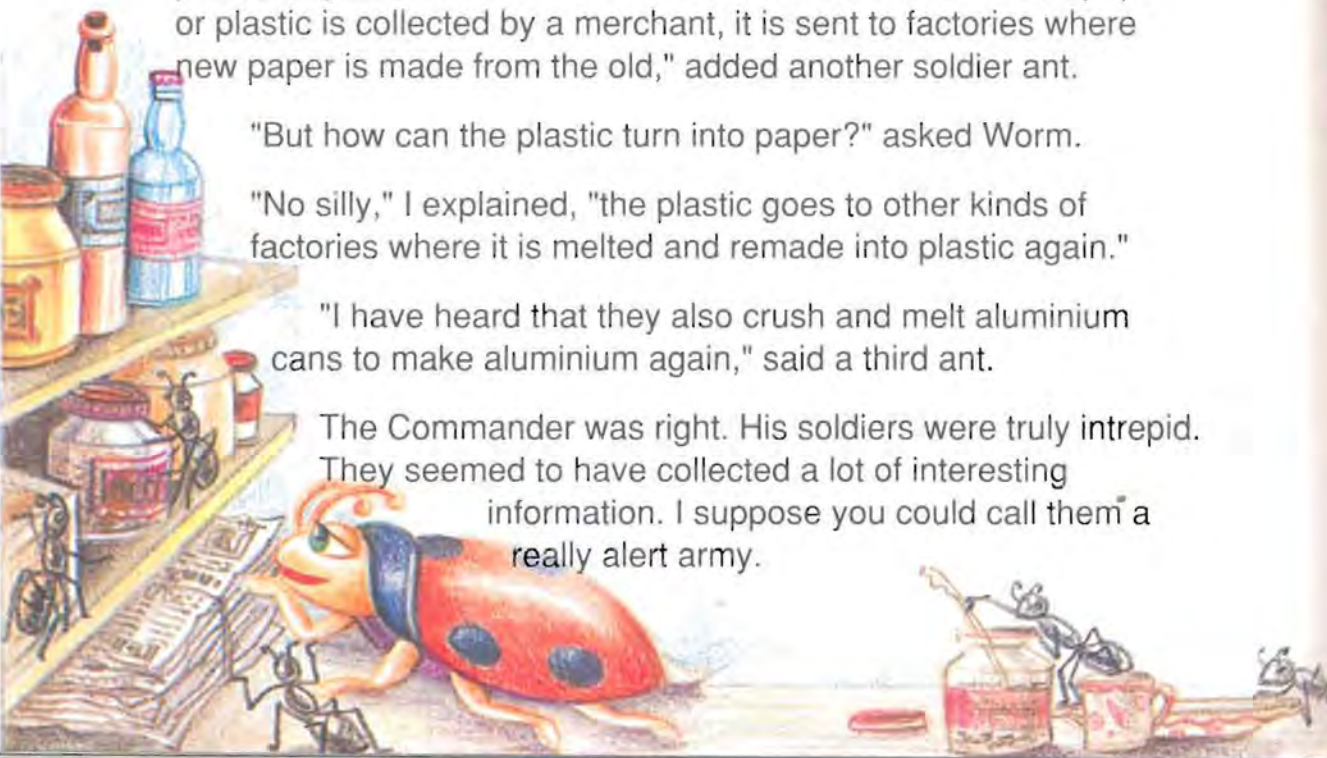
"I've overheard these buyers talking about further selling these things to some big merchants," said one of the soldiers. "And one of the worker ants whose relative once went away by mistake in a plastic bag told me that he has heard that when lots of such paper or plastic is collected by a merchant, it is sent to factories where new paper is made from the old," added another soldier ant.

"But how can the plastic turn into paper?" asked Worm.

"No silly," I explained, "the plastic goes to other kinds of factories where it is melted and remade into plastic again."

"I have heard that they also crush and melt aluminium cans to make aluminium again," said a third ant.

The Commander was right. His soldiers were truly intrepid. They seemed to have collected a lot of interesting information. I suppose you could call them a really alert army.



"With your permission, sir," a soldier ant who looked younger than the rest, hesitantly spoke up. "I recently heard from a cousin who is with a flying squad that moves around a lot. He was talking about something similar—you know turning old paper or plastic into new paper or plastic. He said they even have a name for it. 'Recycling', I think he called it." And the young ant lapsed into an embarrassed silence.

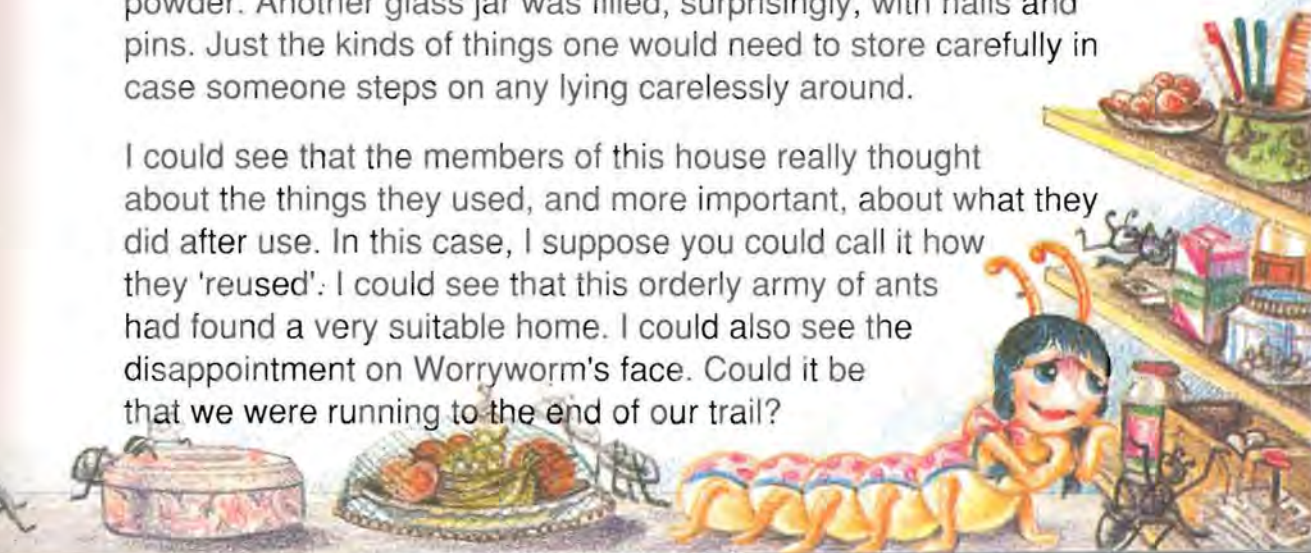
That was enough to get Worm all excited. "What a good idea," she clapped. "Turning old into new instead of just throwing it all away. Must remember to find out more about this 'recycling' business."

"But," she suddenly exclaimed, "what about other things like glass bottles and jars, and plastic containers? I don't see any here. Does the family throw them away?"

"In fact not, ma'am," replied one of the soldiers. "If you may permit us to escort you up these shelves, you will see what I mean."

And we did. We saw row upon neat row of filled bottles and jars. The important thing was, that most of these were filled with things other than what originally came in them. A bottle that looked like the jam bottle in the shops, was now filled with some kind of spice powder. Another glass jar was filled, surprisingly, with nails and pins. Just the kinds of things one would need to store carefully in case someone steps on any lying carelessly around.

I could see that the members of this house really thought about the things they used, and more important, about what they did after use. In this case, I suppose you could call it how they 'reused': I could see that this orderly army of ants had found a very suitable home. I could also see the disappointment on Worryworm's face. Could it be that we were running to the end of our trail?



Suddenly, she brightened up. "OK, OK," she said, "its all very well that things are what you call 'recycled' and 'reused'. These are made from materials like paper, plastic or aluminum that do not easily or naturally get destroyed. But don't tell me this family saves up all its peels and egg shells and bread crumbs for a whole month to give to someone else?" She literally shuddered at the thought. But her eyes were gleaming. "Aha," she was thinking, "let's see this orderly army give me an answer to this one!"

By this time the Commander himself had arrived on the scene. And it was he who took on Worm's challenge.

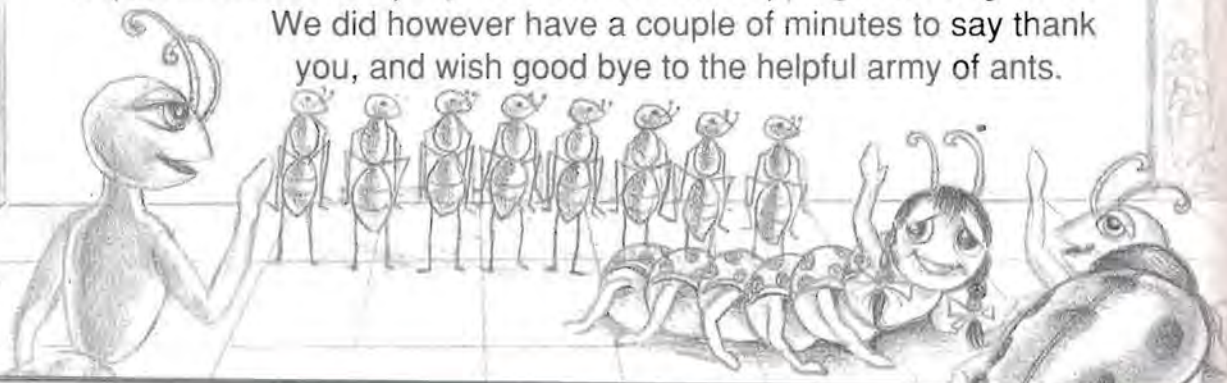
"Rather rotten idea that," he snapped. "But in my regime all questions will be answered as best as we can. However, the answer to this one lies outside the limit of my command area. It lies in the pit at the bottom of the garden."

"What, besides that answer, lies in the pit?" cried Worm excitedly. I could see that she was quite revived at the idea that our mystery trail had not reached the end in Commander's clean kitchen.

"I will not tell you more, miss, nor detain your mission further. My troops will escort you as far as the front door. From there you will be on your own." He saluted smartly and called "Attention! March... Hup... two-three...hup..."

Before we could say "thank you for your help sir," we were caught in a quick march and rapidly found ourselves stepping into the garden.

We did however have a couple of minutes to say thank you, and wish good bye to the helpful army of ants.



Discovery Down Under

Worryworm continued her quick march. I ran behind her. "Hey, Worm, wait! Your army escort has gone back. You can slow down," I called. "Oh, sorry Bug. Just got into the pace you know," she said as she slowed down and waited for me to catch up. "Let's find that pit that Commander Ant was talking about. We've got to find out about all those leftovers from the kitchen."

"They'll be piling up in a rotten heap somewhere in the garden, I suspect," I panted. "For all the order and systems in that house, even they have to throw something away. So what if it's not in the kitchen garbage can?" I was getting a bit tired of this endless garbage treasure hunt.

"The garden looks too well-tended to be full of heaps or holes," Worm said. "What would anyone want to dig a pit for, over here? There must be some reason as to why the Commander directed us out here." She scurried along, looking left and right for signs of a deep pit in the ground.

Suddenly, Worm disappeared! Vanished, right there, in front of my eyes! I stopped short. "Worm, Worm," I called. "Where are you?" I looked all around, but nothing. This was a real mystery, but not one that I was enjoying too much. I didn't fancy being all alone in this strange garden. Never mind if it was pretty and neat.

Then I heard a rustle of dry leaves not far from where I stood. And from the leaves popped out Worm's head. "Bug, Bug," she squeaked in excitement. "I've found it, that pit we were looking for."



"Stumbled into it you mean," I snapped. She had given me such a scare, disappearing like that, leaving me alone. Here she was now squealing in excitement, with not even a "Sorry I vanished," or a thought for me.

"Stop being so grouchy, Bug. Come on, jump in. You'll never guess what's in here," she urged.

"A lot of dry leaves, what else?" I grumbled.

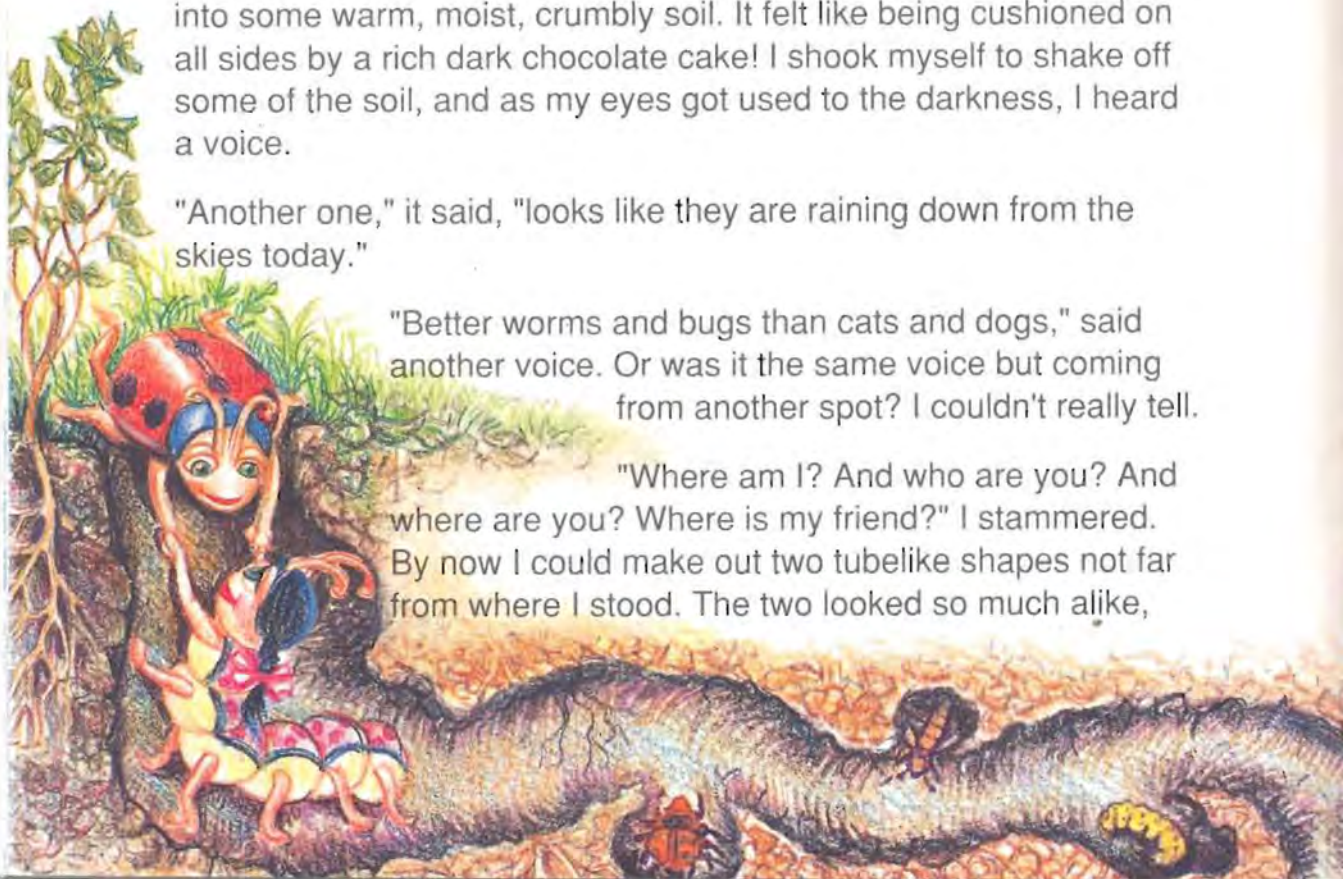
"There's more than meets the eye. Just drop in and you will find out," said Worm, as she once again disappeared. Now Worm was beginning to talk in riddles. Well, I wasn't going to be left high and dry after all these adventures, and let Worm solve the mystery.

So I plunged in through the crackling cover of dry leaves and landed into some warm, moist, crumbly soil. It felt like being cushioned on all sides by a rich dark chocolate cake! I shook myself to shake off some of the soil, and as my eyes got used to the darkness, I heard a voice.

"Another one," it said, "looks like they are raining down from the skies today."

"Better worms and bugs than cats and dogs," said another voice. Or was it the same voice but coming from another spot? I couldn't really tell.

"Where am I? And who are you? And where are you? Where is my friend?" I stammered. By now I could make out two tubelike shapes not far from where I stood. The two looked so much alike,



I wasn't sure if the plunge into the pit had affected my eyesight and I was seeing double.

"Where, who, where, where," said one shape.

"In which order?" said the other. "Let's start with who," started one "and then go to where," finished the other.

"I am Down " said one. "I am Under" said the other .

"Together we make up the famous pair Down and Under," they said in chorus.

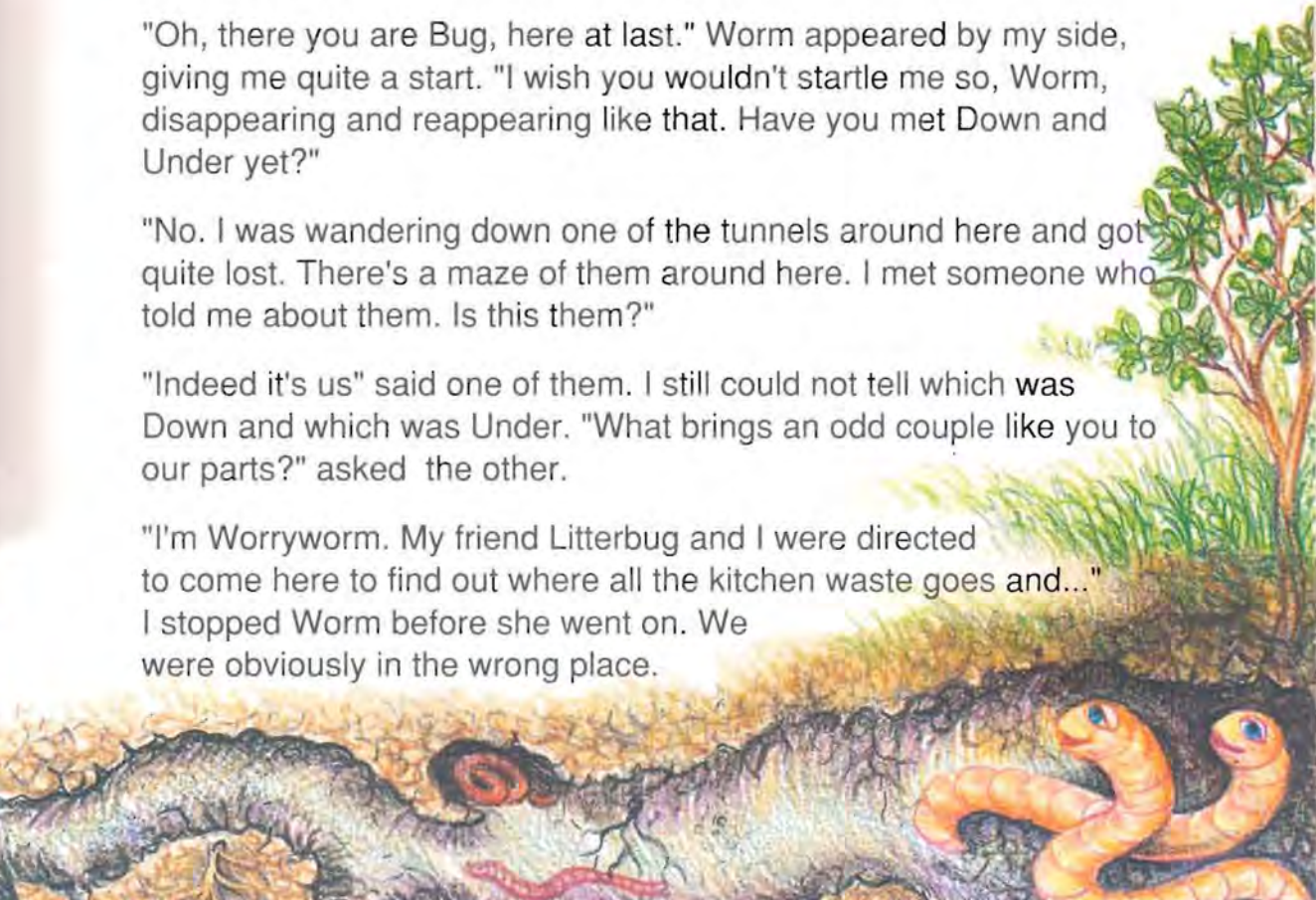
"Pleased to meet you Mr Down, Mr Under. I am called Litterbug. Not so famous, but who knows, someday..."

"Oh, there you are Bug, here at last." Worm appeared by my side, giving me quite a start. "I wish you wouldn't startle me so, Worm, disappearing and reappearing like that. Have you met Down and Under yet?"

"No. I was wandering down one of the tunnels around here and got quite lost. There's a maze of them around here. I met someone who told me about them. Is this them?"

"Indeed it's us" said one of them. I still could not tell which was Down and which was Under. "What brings an odd couple like you to our parts?" asked the other.

"I'm Worryworm. My friend Litterbug and I were directed to come here to find out where all the kitchen waste goes and..." I stopped Worm before she went on. We were obviously in the wrong place.



"Listen Worm, this isn't that place. Can't you see this isn't a stinking rotten heap of leftovers? Can't you feel and smell the lovely rich soil in these parts? Nice meeting you, Down and Under, we had better be on our way..."

"Ha Ha," chortled Down.

"Hee Hee," chuckled Under.

"That fooled you didn't it?"
giggled Down and Under.

"Fooled? How? Wrong address you mean?"

"Right address," said Down, "Wrong conclusion,"
said Under.

"Wait a minute" said Worm. "Let's start again, where are we, and who are you?"

"This is called a compost pit" explained Down. "And Down and me belong to a family called the Earthworms," continued Under.

"So what's the joke?" asked Worm.

"Just that this is where all those leftovers that you are looking for do end up," said Down.

"But our family, other worms, microbes and other creatures who live here have the magic to make it disappear," said Under.

"And then make it reappear as some of the best manure you can find," added Down.

"How on earth can you do that?" worried Worm.

"You mean 'how under earth' ," chuckled Down.

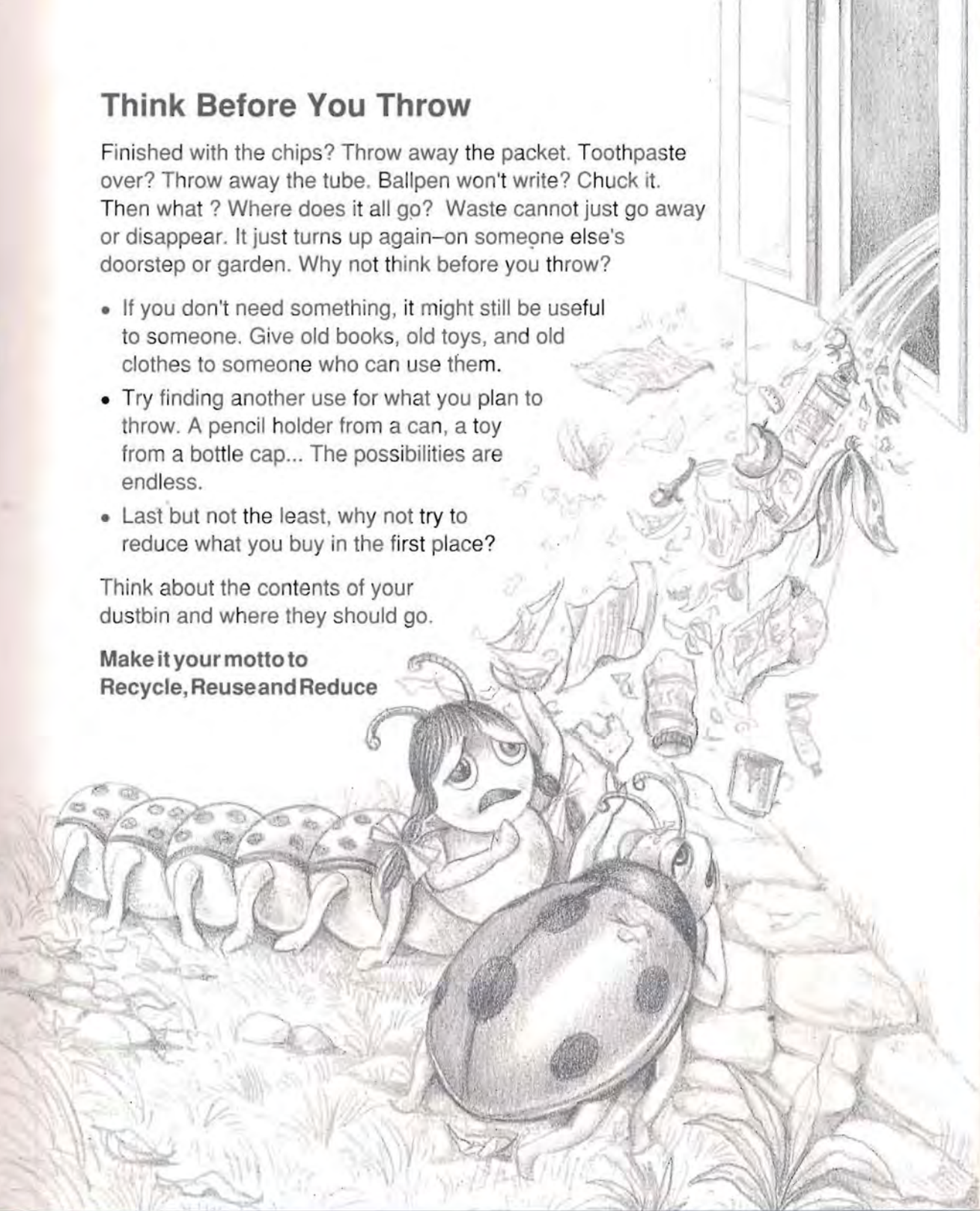
Think Before You Throw

Finished with the chips? Throw away the packet. Toothpaste over? Throw away the tube. Ballpen won't write? Chuck it. Then what? Where does it all go? Waste cannot just go away or disappear. It just turns up again—on someone else's doorstep or garden. Why not think before you throw?

- If you don't need something, it might still be useful to someone. Give old books, old toys, and old clothes to someone who can use them.
- Try finding another use for what you plan to throw. A pencil holder from a can, a toy from a bottle cap... The possibilities are endless.
- Last but not the least, why not try to reduce what you buy in the first place?

Think about the contents of your dustbin and where they should go.

**Make it your motto to
Recycle, Reuse and Reduce**



Commander Ant's army has just raided a garbage can. The ants
the can, doesn't have to be there at all. Let's find out what they've



ca
sh

I can make
some pocket
money
by selling

They can. The ants have discovered that much of what is in
littered out what they've found, and what they plan to do with it.



If they had carried their own bag for shopping this wouldn't be adding to the litter.

These could have been swept straight into the flower beds.

Off to the compost pit with this to help make the soil rich.

I can turn this into a pretty pencil holder.

I can make some pocket money by selling this.

I could make a useful rough pad with the remaining pages.

New From Old

Used toothbrushes, broken slippers, bottle caps ... what else can one do but throw them away? Here are a few ideas on how these can be transformed. Ideas that reuse, recycle and thereby reduce the waste we see everywhere. Try these. You will get many more ideas of your own. Share them, enjoy them!

Bottle-bird

Ready to throw away that empty bottle of eye drops? Wait. Try turning the bottle into a bird! Here is how.

You will need a small glass bottle with nozzle (as in eye and ear drops), some stiff coloured paper, scissors and gum.

You can convert the empty dropper bottle into a bird by making the plastic lid with the nozzle into the head and beak of the bird. Stick two eyes made of paper or tiny beads, on this. Paste coloured paper on the bottle. You can wrap cotton, cloth or wool threads around the bottle to make the bird's body. Make wings out of stiff paper and stick them to the body. Your bottle-bird is ready to fly!



Brush-hog

Time for a new toothbrush? Rather than throwing away the old one, try turning it into a hedgehog.



You will need an old toothbrush, some clay, and paints.

Cut off the stick of the old toothbrush and discard it. Keep the brush part. Make a small animal head out of clay. Stick it to the end of the brush. Pinch ears out of the clay. Colour the head. Paint on eyes. Stick on whiskers. Attach a tail at the other end. You can make this from twine or rope.



Your brush-hog is ready.

You could also make squirrels, bears, porcupines and other animals from shaving brushes, boot polish brushes, etc.



"Our magic formula is garbage in, ingest, digest, egest, castings out," recited Under.

I was getting quite lost in all this. "Listen," I said, "all these formulae and word play are too much for me. Could you try explaining all this in an easier way?"

"A little more down-to-earth as it were" said Worm. Trust her not to be left behind in all this word play!

"OK, jests apart," said Down "this is what we earthworms do. We live underground." "Burrowing deep in the soil by making all those tunnels that your friend here got lost in," explained Under.

Disappearing Tricks

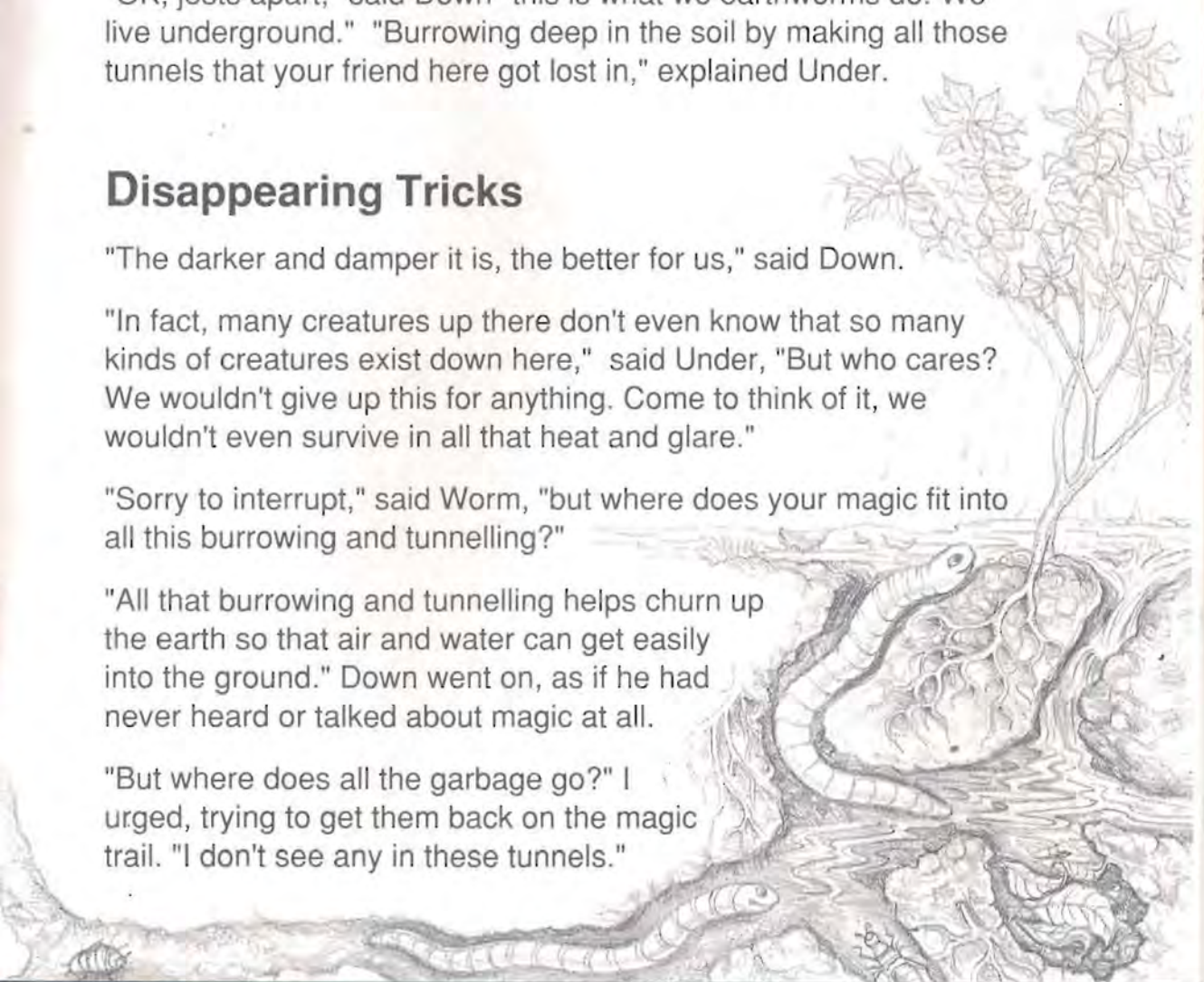
"The darker and damper it is, the better for us," said Down.


"In fact, many creatures up there don't even know that so many kinds of creatures exist down here," said Under, "But who cares? We wouldn't give up this for anything. Come to think of it, we wouldn't even survive in all that heat and glare."

"Sorry to interrupt," said Worm, "but where does your magic fit into all this burrowing and tunnelling?"

"All that burrowing and tunnelling helps churn up the earth so that air and water can get easily into the ground." Down went on, as if he had never heard or talked about magic at all.

"But where does all the garbage go?" I urged, trying to get them back on the magic trail. "I don't see any in these tunnels."





"Inside us, silly, not the tunnels," laughed Down. "You see we earthworms eat it and it passes right through our bodies. We use the minerals and vitamins in all that, but the leftover stuff..."

"...comes out at the other end. These droppings are called castings and that's what makes up this lovely crumbly soil that surrounds you now," said Under.

"You mean all those stinking scraps end up like this?" We both spoke together in surprise. "No wonder we couldn't find any in the garbage can or garden. But who would have ever guessed?"

"It wasn't just by chance," said Down. "The family that lives here made a special effort. They dug a pit, they prepared it by lining it with dead leaves and grass." "They brought our family of garbage eating earthworms over and gave us a new home here, where we joined lots of other tiny friends," said Under.

"Now they make sure they feed us well, and also make sure that the pit is always covered with leaves and a thin layer of soil, and kept moist too. On our part, all the creatures here help them by enjoying the food and making good manure in return." "What a good arrangement!" clapped Worm. "But why can't they put everything in here instead of collecting old paper, plastic, bottles and cans?"

"For the simple reason that we earthworms and the others in here don't eat such manmade trash," said Down angrily. "Its unnatural. Plastics—pooh. Glass—ugh. Tin cans—what horrid unpalatable things."

"Junk food, we call it," snorted Under. "Give us natural foods any day. Peels—yum, dead leaves—delicious, egg shells—scrumptious, and dinner leftovers—mmm! Makes my mouth water."

"Did you know we can eat our own weight in food each day? Let our great big family get together and several hundred of us can gobble through almost 250 grams of such garbage in one single day."

"That must be as much as an average family in our parts throws out each day," I thought aloud.

"Can you imagine what it would mean if more people were to make such compost pits?" asked Worm excitedly. "At least those rotten stinking heaps of kitchen waste would be reduced."

"That would mean cleaner streets, less flies, less rats and a healthier environment." I could just see those heaps disappearing by magic. The Down and Under variety, of course!

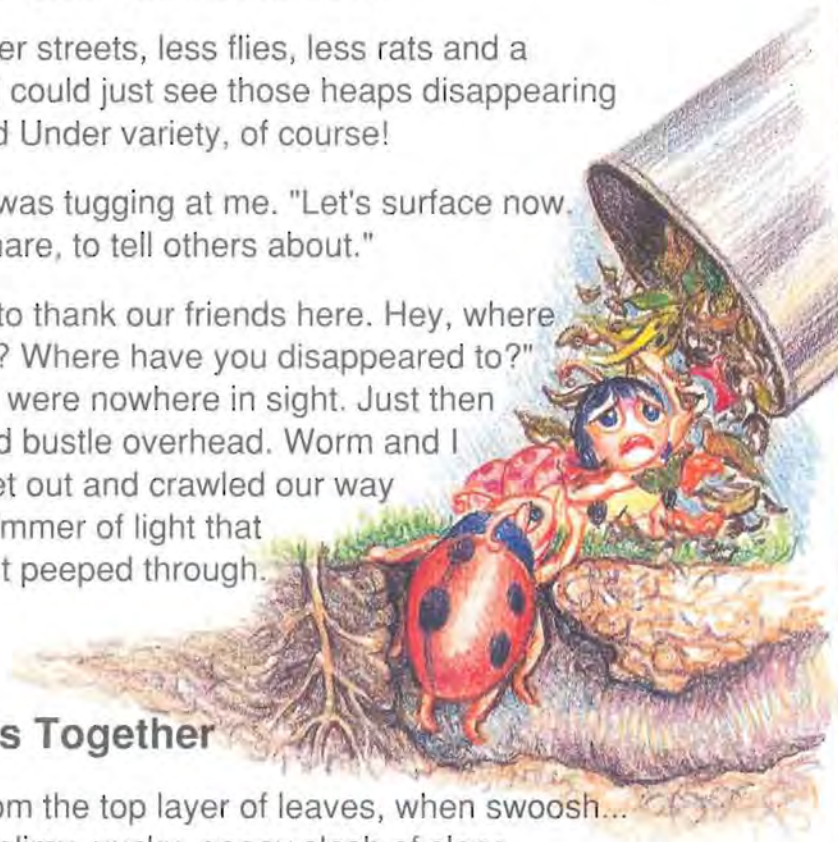
"Come on, Bug." Worm was tugging at me. "Let's surface now. We've got so much to share, to tell others about."

"Yes, but first we've got to thank our friends here. Hey, where are they? Down? Under? Where have you disappeared to?" I looked around but they were nowhere in sight. Just then I heard a great rustle and bustle overhead. Worm and I decided it was time to get out and crawled our way towards the very faint glimmer of light that shone where the sunlight peeped through.

The Jigsaw Comes Together

We had just emerged from the top layer of leaves, when swoosh... we were buried under a slimy, yucky, gooey slosh of slops.

"Glug, Glug," I spluttered. "Worm, where are you? We are back where we began. Buried in garbage again!"





"Here, Bug help me out of this tangle of peels," sputtered Worm. Tugging and pushing each other upwards, Worm and I clambered up the side to the top of the pit. We both took a deep breath.

"Phew," I shook myself to throw off any bits still sticking, "what a way to come back to earth."

"Away, away" cried Worm. "That's what started our adventure—the search for 'away'. But Bug, we haven't found 'away' even after all this."

"No, we didn't find 'away', Worm," I agreed, feeling equally sorry for myself. I shut my eyes and I could just see our long garbage-filled journey pass before my eyes. And suddenly, it hit me.



"But Worm," I began slowly, not quite clear myself, how to explain this. "We did discover something. We discovered that there is no 'away'. Everything we tried to follow ended up somewhere else—paper, plastic, glass, tin cans, even kitchen wastes."

"That's true," said Worm thoughtfully. "It wasn't always in the same shape or size or form, but it was still there all the same."

"Yes," I added, as it began to get clearer than before, "even the peels and shells and scraps and leaves didn't vanish into thin air to that magical 'away'. They just changed into something else. In this case, something good and useful."

"Yes and no," said Worm. "There was a difference between the paper and plastic and glass and tin and the things we just saw. It was the difference between manmade and natural waste as Down and Under described it."



"Ummm," I said absently as all that we had heard and seen began to seem to make more sense.

The kitchen waste that could be put in the compost pit would be taken care of by nature and its friends. But the paper and plastic and tin cans, these would remain just the same for years, if simply thrown out. Other ways of doing things with these needed to be found.

"That's it Worm," I could almost see all the pieces fall together like in a jigsaw puzzle. "We did find out a lot about waste—what waste is, where it comes from, different types of waste..."

"So we didn't waste our time after all," declared Worm.

"Do let me finish Worm. I was coming to the most important part. We also found out what can one do with waste."

"What do you mean 'do' with it?" It was a long time since Worm had asked one of her worry questions. "What can we do? We just discovered that we can't wish it away, because there isn't an 'away'."

"Worrying won't help much, you know," I teased. "But seriously Worm, think back on all our adventures. What kind of things did we see happen?"

Worm was quiet for a moment. I could see that she too was thinking back over what we had seen and heard and experienced.

"Well," she began, "some of the things could be reused. Remember we saw all those bottles and jars that had been refilled?"



Reuse

"Right track, Worm. What else did we see? Remember, about what happens to paper and plastics?"

"It was called re..., re-something. I remember! 'Recycle', wasn't it?"

Re-fill

"Right again! Recycle means to do or use over and over again. Like making new paper from old, aluminium sheets from aluminium cans, or plastics things from old plastics."

"And even manure from kitchen waste," joined in Worm. "Isn't it wonderful how nature has always had its special recycling ways?"

"Yes, nature will take care of what's natural. What we really need to worry about is all that waste which is made by humans—'manmade'—as it were. Even with reuse and recycling, there's far too much waste that has no final 'away' to disappear into. What can we do about that?"

Restore

Cracking The Code

That set Worm into a real worry. "There must be something" she mused. "Something that may not be the answer, but that can help, maybe just a little...." She fell into a worried silence. I too thought silently. Suddenly she exclaimed, "I know! A third 'R' may be one way out! Guess Bug. Can you guess?"

Renew

"Goodness me, no," I replied. "There are so many 'R's—repair, renew, restore, return..."

"No, no, those are all helpful after you've already got something. My R comes before all these. Give up? It's 'Reduce'!"

"Reduce? Reduce what?" My head was reeling with too many 'R's.

*Repair**Return*

"Reduce what we buy and what we use in the first place," said Worm, eyes shining with her new discovery. "Just think, Bug. Do we always really need all that we buy? Even after we buy, what do we get? Packing—all kinds, fancy and fun paper, plastic, cellophane, styrofoam, foil—layer upon layer, just waiting to be peeled off..."

"Isn't that what packages are for?" I was puzzled. "To be opened?"

"Yes, but then what?" queried Worm. "You throw the wrappers away," I replied instantly.

"There! Caught you in your own trap," declared Worm. "That's where our story began—remember those two plastic bags?"

"Oh! Now I understand." I really did. "By 'reduce' you mean to try and stop waste from happening in the first place. That means thinking about what we buy and use and will have to throw away, even before we begin."

"Exactly, dear Bug," said Worm. "Just think, if each and every one of us took just a minute to think about this, would it not make a difference?"

"Hey Worm," I jumped with excitement.

"We've not only solved our mystery, we seem to have cracked the secret code too."



"Now that it's no longer such a secret, we must tell everyone about it," said Worm. "About what happens to waste, and what each one of us can do about it. Let's call it the R code."

"Just imagine, if we could convince everyone to follow the code, my grandchildren may never understand why I was named Litterbug!"

"That's it Bug. You and I are going to tell everyone about this wherever we go."

We are all part of the 3 R army
Worm and Bug and you and me.
We think what we buy, and think what we use.
Save what we can, repair, and reuse.
Recycle where we can, turn old into new
Most of all, we pledge to reduce.
To cut down on waste, right at the roots.
That's our 3 R pact—Recycle, Reuse, and Reduce.

And so, Worm and I made a pact—a 3 R pact—and we'd like you to join our pact too. Here's to a litter-free world!

See you in our next adventure!



Re-search

Worryworm is always showing off about her vocabulary. Let's see how many 'Re' words you can find here.



A	C	E	R	E	B	U	I	L	D	R	A	V	I
M	A	M	A	E	A	L	K	A	D	E	V	E	S
S	A	N	S	Y	G	O	P	I	M	A	S	I	R
A	C	T	R	E	N	E	W	S	N	O	W	E	G
R	E	D	E	S	I	G	N	S	R	W	T	U	R
A	E	K	S	A	D	I	T	E	M	U	H	E	E
H	A	D	O	R	A	M	S	F	R	Y	G	O	J
X	R	E	U	S	E	T	T	N	B	A	J	S	E
K	E	W	R	C	O	L	A	G	I	B	T	R	C
N	S	U	C	R	E	D	O	N	M	O	O	E	T
Q	P	R	E	O	I	L	D	N	Q	B	S	V	A
R	E	P	A	I	R	S	R	E	C	L	A	I	M
A	C	N	O	W	L	E	D	G	E	S	Q	V	W
A	T	S	U	N	I	L	Q	X	M	A	D	E	S

Now that you have found them, do you know what all these words mean? If not, try to find out.

Answers to Re-search on page 47

Trash Detectives

If Worryworm and Litterbug were to visit your home, what would they find in your garbage can? Bet you don't know yourself!



How about becoming a Trash Detective for one week and getting to know more about your own family garbage?

You could begin by making a survey chart like this:

Home Garbage Survey Chart

Day	Type of Garbage					
	Paper	Glass	Aluminium/ tin foil	Plastic	Kitchen waste	Other (batteries, etc.)
Mon						
Tue						
Wed						
Thu						
Fri						
Sat						
Sun						

Fill in this chart at the end of each day. First remember to set a unit of measurement for each item, that is, glass or cans could be counted by numbers of items. Paper may be counted by number of pieces or sheets. Kitchen waste (vegetable peels, egg shells, tea leaves, left-over food, etc.) may have to be weighed or measured in a standard measure: e.g. cup or small pan.

At the end of the week add up the totals. Review your findings. How much of what was thrown could have been reused or recycled? And how much was the result of wasteful use? Could it have been reduced?

P.S. Make sure you wear gloves while sorting garbage. If not, wash your hands well after your detective stint! and beware of broken glass.

Make a Compost Pit



Your survey may have revealed that a lot of kitchen waste is thrown away in your home.

What about making a compost pit to put all this

to good use? If you have a garden, it is a good place to start one. If you don't, you could get together with some friends and make a common pit for your neighbourhood.

Down and Under show you how.

Dig a pit about 1/2 metre wide, 1 metre deep and as long as you can make it. Preferably make it at the far end of the garden.

Line it with straw or dried leaves and grass.

Put in the waste material as and when generated, and cover with sprinkling of dried leaves and soil.

Water once or twice a week to keep it moist.

Turn the contents of the pit every 15 days.

The compost will be ready in 3-4 months. Take it out and spread in your garden.

Some things that can go into your compost pit:

Used tea leaves

Overripe or spoilt vegetables and fruits

Egg shells

Vegetable and fruit peels

Leftover or spoilt food

Cut grass and fallen leaves

Composting is nature's way of recycling. Most natural things decompose over a period of time. That is, they are broken down by the combination of factors such as time, weather, air, water, insects, worms and tiny microbes. All these are called decomposers. The process by which the breaking down takes place is called decomposition.



The Trail Goes On

Worryworm and Litterbug have been busy following the garbage trail from house to house.

Have you ever given a thought to what happens to the garbage that every house throws out each day? Try and find out what happens to it. Does it just collect in a growing heap at the corner of your neighbourhood? Is it picked up by a municipal garbage truck on certain fixed days? If yes, where does it go from there? Let's try and find out what happens.



Sometimes the garbage is collected and taken to a place like a dried up pond or large depression in the ground. It is dumped here and continues to be dumped till the place fills up. But this can be dangerous for the environment and for health, firstly because the garbage is thrown in without being sorted. That means that it could include all kinds of things, from kitchen waste to plastic, chemicals, paints, used medicines and poisonous substances. These start reacting to the air, the changing temperature and other external conditions. Harmful gases and liquids start to form. These poisonous substances mix with water from rain. This liquid, known as leachate then mixes with water underground, poisoning and polluting it. This water is used for drinking, bathing etc. The open garbage in the dump also attracts flies, rats and other disease carriers, creating serious health hazards.



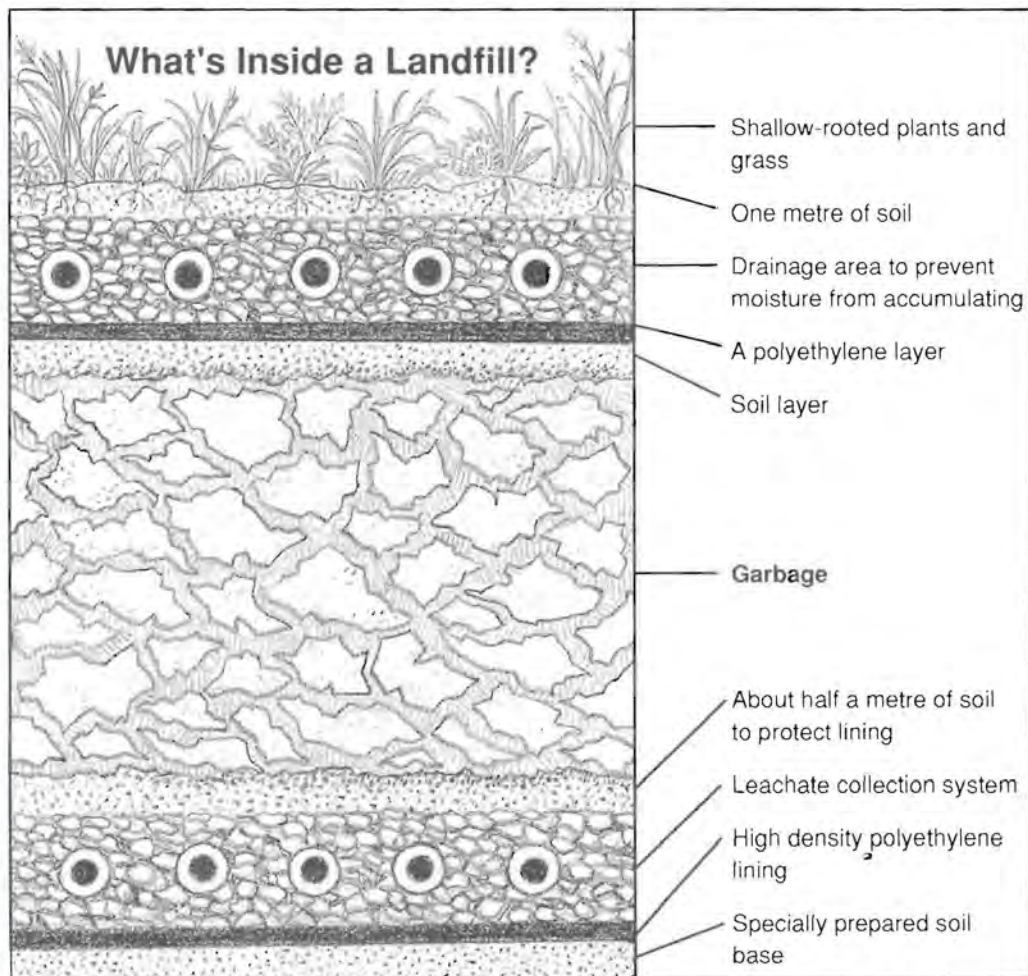
Today many countries are developing more scientific ways to dispose or dump garbage. They are creating sanitary landfills.

Landfill sites are carefully selected keeping in mind the soil type of the area, the distance from residential areas and main water sources, and the nature of the surrounding environment.

The landfill is systematically constructed. The area is dug and then lined with layers of clay or plastic so that no liquid leaks out. Whatever liquid percolates through is collected and taken to a treatment plant where it is purified, and pollutants and poisons are removed. Arrangements are also made to channel off all the poisonous gases that are created by the rotting garbage.

The garbage trucks daily dump the collected waste in these landfills. At the end of the day, this is covered with a sealed layer of soil to prevent bad smells and to avoid attracting flies, rats and other scavengers. Thus layer upon layer is built up in the landfill. When the area is completely filled, it is properly covered with plastic and soil, and closed. These areas could then be used for developing parks or gardens. Even buildings can be constructed on these.

Even this type of landfill does have its problems. For example, a lot of space is needed for such landfills. Most cities are already overcrowded. Where does one find so much space?



A Re-look at Recycling

Worryworm and Litterbug heard a lot about something called Recycling. That is when things that have been used once are processed and turned into new things. Let's take a closer look at how paper, plastic and aluminium are recycled.

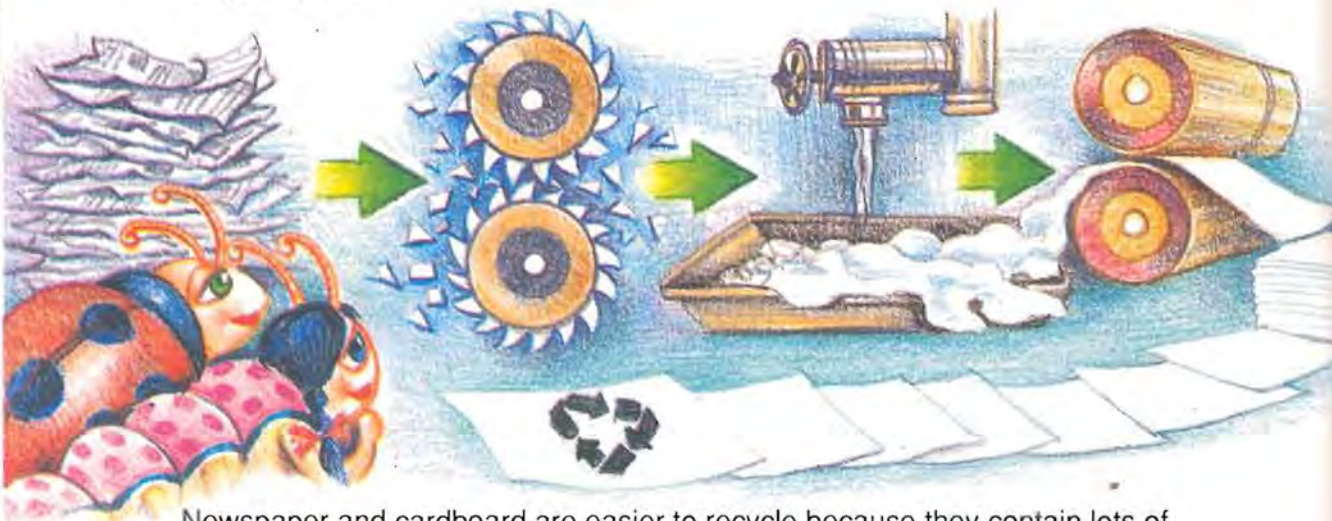


Paper

We all know that paper is made from trees and bamboo. Machines and chemicals turn the wood from trees into fine hairlike strands called fibres. The wood fibres are mixed with water to make pulp. The pulp is pressed into sheets and dried. And you have paper.

To make recycled paper, waste paper is used instead of wood. In this process the used paper is often first cleaned to remove the ink.

The waste paper is then shredded into small bits. These are then mixed with water and made into a mushy mixture. The pulp is sent through a machine which presses it into sheets. These are dried and they become new sheets of recycled paper.



Newspaper and cardboard are easier to recycle because they contain lots of strong fibres that can be reused to make new sheets. Paper that is coated with wax or plastic, like soft drink and milk cartons, cannot be easily recycled.

Paper can be recycled a few times, but it can't be recycled over and over again. That's because after a few times, the fibres get smaller and weaker. Then the paper doesn't hold together so well, and tears easily.

Recycling paper means more than just saving trees. When one tonne of newspapers are recycled, almost 20 trees are saved. Making paper from paper also saves energy and water as compared to that used when paper is made from trees. The air and water pollution caused in the process are also less in recycling than in the process that uses wood pulp. And recycling also helps reduce the amount of paper reaching landfills. The paper that would have gone into a landfill goes back to a factory for a new look and a new use.



Aluminium

Did you know that if you throw away an aluminium can, it can take over 500 years for it to be broken down by natural elements like the sun, wind and rain?

Aluminium is made by mining bauxite and then processing it. Aluminium is used for making very many things, from aeroplanes to cooking foil, from window frames to beverage cans. Most of this can be recycled.

The process of recycling an aluminium can begins at the factory when the cans are flattened. They are then shredded into pellets. These are then put into a smelting plant or smelter where they are melted. Impurities are removed and the aluminium is rolled into sheets or poured into moulds and cooled. These are then turned into cans and myriad other products. And the whole cycle starts once again.

Recycling aluminium cans helps save energy. It takes about the same amount of energy to make one new can, as it does to make 20 recycled cans. Recycling also reduces the need for more bauxite. Less mining means less damage to the earth, and less cans thrown away means less garbage to litter the land.

Plastics

It's the age of plastics. Just about everything we buy or use seems to be packaged in plastic. This is obviously because plastic is a practical, flexible, strong, multipurpose, cheap material. But all that makes plastic so attractive also makes it a problem when it lands up in the garbage can. That is because plastic is permanent. It will not naturally disappear if you throw it out.

So how can one get rid of it? Burying won't help because it doesn't disintegrate and it does take up a lot of space in a landfill. Burning isn't good because the gases released from burning plastic is harmful to health. Recycling isn't such a good idea either, because the process of recycling, if not done properly, also causes pollution of air and water.

Often the first step in a recycling process is to sort and separate different kinds of plastics, putting those with similar chemical compositions together. Only plastics which have a similar chemical make-up can be recycled together.

Plastics are melted and remade into tubs, buckets, mugs and other containers, as well as cheap toys. Shredded plastic is used as filling for jackets or pillows. Today, more and more uses are being found for recycled plastic. But we must not think that recycling is the answer. The real answer is to reduce plastic waste, and that means cutting down on unnecessary use of plastics.

The day is not far when the plastic soft drinks bottles you drink from today may end up as your pullover tomorrow! Already some companies in the USA are marketing jackets and pullovers made entirely from recycled plastic bottles. The material from these plastics is similar to polyester. It is warm, soft and can be easily washed.



Waste all the Way

A product does not create waste only when it is thrown away. No matter how small, each thing that is made, leaves behind a trail of wastes at every stage of its life—as it is produced, packaged, transported, consumed, and finally discarded.

This piece of paper of example, began as a tree. When the tree was cut down, the mechanical saws created exhaust fumes and wood waste in the form of bark, sawdust, etc. The tree was then transported to a pulp mill on a truck which burned diesel or petrol and generated exhaust which polluted the air. The pulp and paper mill produced both liquid and gaseous waste in the process of turning the wood into paper. This also led to air and water pollution. The paper was packaged and transported to the market again by a truck. Finally when this piece of paper is discarded, a garbage truck will pick it up and take it to a garbage dump or a landfill. Or it will continue to lie on the road and litter the surroundings. At every step in its life-cycle some kind of wastes are generated.



All Wrapped Up

What did you and your mother bring home from the market today? Cereals, vegetables, butter, jam, soap...? Yes, of course, things you need. But with these you also brought along some other things you did not need; things that you will probably throw away as soon as you unpack the shopping bags.



That's right, you also brought a lot of packaging. That's the paper and cardboard, plastic and cellophane that the things you need come packed in.

Packaging serves a vital function. It helps to contain, carry and distribute materials. It also helps keep things clean, fresh and protected. Packets often give information about the product and instructions for its use.

Today however, packaging is also used to advertise products, to attract people to buy these and to help in their sale. Often there is much more packaging than is needed to safely pack and transport the product. And all that packaging ends up in our garbage cans, and on our roads, in our rubbish dumps and our landfills. And there it remains, for a long time.

What can you and your family do to help reduce this problem? Here are some ideas to start with:

- Don't buy goods that have unnecessary packaging.
- Buy in bulk rather than a number of individual small packages.
- Buy beverages in returnable bottles rather than take-away and throw-away ones.
- Avoid packaging waste by buying large economy packs, and save money too.
- Where biodegradable refill packs are available, buy these.
- Carry your own shopping bag. Avoid bringing home unnecessary paper and plastic.



Market Survey

The next time you go into a shop take a closer look at the attractively arranged shelves and conduct your own survey.

- What kind of packaging is the most common?
- What kind is the most attractive?
- What kind of products have the maximum packaging? (Those that may spoil easily? Those that may break easily? etc.)
- How much of the packaging is unnecessary?

When you go home and unpack after a shopping spree, how much paper, plastic and other packaging material do you discard?

- What do you do with this?
- How much could you have avoided if you had carried your own bag?



Write an Autobiography

Now that you know more about how things are made, and remade, put yourself in the place of a newspaper or a can or a bottle in your house. Imagine how you began life, what went into making you what you are, how you were used and what will happen to you later.



To help you get started, here are some questions you could tackle. For filling in the details, you will have to do some detective work of your own.

Don't forget that now you are the newspaper, or can, or bottle, or any other object that you have chosen!

Am I useful in myself or am I packaging for holding something else?

What do I look like?

What am I used for?

What am I made of?

What natural resource or raw materials were used to make me?

How much energy is required to make me?

Are there large amounts of my raw material available or are they limited?

How was I made?

Did the process of making me cause pollution of the land, air or water? If yes, how?

How was I transported from the place where I was made to the place where I was sold?

How was I packed?

Am I thrown away after I am used?

What will happen to me after I am thrown away?



Will I break down by natural processes if I am buried?

Will I disintegrate if I am thrown into a river or lake or ocean?

If I am burned, will harmful chemicals be released into the air?

Can I be recycled? Are there any recycling factories where I am?

What will happen to me after I am recycled?

Can I be reused in any way? How?



Finally the most important questions may be:

Why was I bought?

Am I a necessity or a luxury?

Was I required?

Could you have done without me?

The answers to these questions will give you the facts. Now its upto to you to put in the fun and adventure and mystery into your story! Happy writing!



Answers to Re-search

Redo	Renew	Restore	Return
Reuse	Repair	Regain	Reclaim
Rebuild	Reduce	Respect	Revive
Resource	Redesign	Regenerate	Reject

Think About This



- We think that the problem of 'plastics' and their environmentally-safe disposal is a concern only in industrialized nations. But look around and take stock.

How many items made of plastic do you use in a day? How many plastic bags do you throw away every week? How many plastic ball-pens or refills does an average school or college student use in a month? What happens to the ones that are thrown away?

- Nature's own packaging is unbeatable. Can you think of a more efficient or environmentally-friendly way of packaging the contents of a banana or a coconut?

Think of at least five items of daily use whose packaging has changed considerably in the last few years. Is it in any way better than the traditional packaging? Does the new packaging have the potential of becoming a threat to the environment? If so, how?

- Of the many things we often throw away carelessly, we think paper is the least likely to accumulate as it is biodegradable. But archaeologists have dug up paper that is 2,000 years old. Landfills in USA have revealed newspapers that were ten years old.

What happens to the newspaper in your house after it has been read? Can you trace where it goes?

- Recycling has been a way of life in Asia. Most things take on many different forms and functions during their life cycle.

Of the many things that you discard from your home, list the ones that you give away (e.g., old clothes), sell (e.g., newspapers), reuse for another purpose (e.g., empty bottles and tins), and those that you throw away.

Don't forget
Our 3R Pact!

Remember there is no 'away'. Anything that is discarded remains in one form or another, on our earth.



Books in this Read and Discover Series

Where's Away?

On the waste trail with Worryworm and Litterbug in search of a place called Away.

Forest Tales

Stories, old and new, about forests and forest dwellers.

A B C ... Naturally!

An alphabet book with a difference! Verses and drawings about natural resources.

Puzzling Out Pollution

A facts, fantasy and activity book on pollution.



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