



About Rachel Carson
for
Little Earthkin Friends

RACHEL
CARSON
COUNCIL 

Special Thanks to Charlene Brotman

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Kid's Book of Awesome Stuff

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Rachel Carson's Brief Biography

Born: May 27, 1907 in Springdale, Pennsylvania.

1928: Graduated Summa Cum Laude from Pennsylvania College for Women.

1932: Received a Master's Degree in Zoology from Johns Hopkins University.

1935: Ended graduate studies after her father's death to take over as primary wage earner.

1936: Took a full-time position with the Bureau of Fisheries (became the U.S. Fish and Wildlife Service in 1939) where she wrote articles, edited and eventually became editor-in-chief.

1941: *Under the Sea-Wind* was published.

1951: *The Sea Around Us* was published.

1952: Resigned from the U.S. Fish and Wildlife Service to devote herself to full-time writing.

1955: *The Edge of the Sea* was published.

1962: *Silent Spring* was published.

Died: April 14, 1964 in Silver Spring, Maryland.

1965: *The Sense of Wonder* was published posthumously.

No Peace in Keeping Silent

How Rachel Carson Helped Save the World
by Telling the Truth About Chemicals that Kill

Rachel Carson was a shy little girl, who played mostly by herself. No other children lived near the farm in Pennsylvania where she grew up.



A young Rachel reads to her dog, Candy.

TV and computers hadn't been invented when she was born in 1907, but Rachel was never bored. She loved wandering with her dog through the woods and streams on the farm, discovering snakes and birds, insects, and wild animals.

Sometimes she found fossils of fish and sea shells in the cliffs behind the farm, and tried to imag-

ine the ancient sea that once covered the land.

When Rachel grew up, she was determined to go to college,

even though most women at that time did not do that. Her parents were poor, but they sold the family china and some farm land so that she could go.

At first, the other students thought Rachel was snobbish, because she kept to herself. But then they realized she was just shy, and could be a good friend.

When Rachel decided she wanted to be a scientist, her friends at school said, "You can't! Only a man can be a scientist." Even the president of her college thought that women did not have the strength and brains to be scientists. That was how most people thought in those days.

But Rachel took a test to work as a marine biologist and writer for the U.S. Fish and Wildlife Service. It had never hired a woman before. She scored higher than any of the men taking the test, and got the job.

She was so good at writing about fish that her boss encouraged her to write books. She wrote *Under the Sea Wind*, *The Sea Around Us*, and *The Edge of the Sea*.

In her books she wrote how everything in the oceans and on Earth is connected to everything else and to the environment. It was

From the *Kid's Book of Awesome Stuff*



Rachel decided to become a scientist, though everyone told her that was a man's job..

a new way to think about the world.

Now she was a famous author, so she had to give speeches and talk to newspaper reporters. She didn't like that. She was still shy.

At first when people read her books, many

thought that a man must be the real author. They didn't think a woman could know so much about science. They were surprised to see the author was a small, slender, well-dressed woman with chestnut hair and blue-green eyes.



One day a woman wrote Rachel a letter saying that an airplane had sprayed the bug poison, DDT, over her yard to kill insects. Afterward, she found dead robins on her lawn, their claws drawn up to their breasts in agony. The DDT had killed them.



“Can’t you do something to stop the spraying?” she wrote.

Rachel was already alarmed at the huge amounts of chemicals that were being sprayed onto the earth. New poisons had been invented for chemical warfare during the Second World War, and it turned out that some of the chemicals could kill weeds, bugs, and rodents. So now people sprayed them on lawns, gardens, farms, forests, school yards, parks, and golf courses. They didn’t realize that the poisons were polluting the soil, seeping into drinking water, running off the land into oceans, and killing fish and wildlife.

As Rachel read the letter about the poisoned robins, she knew what she must do. She would write a book so full of facts that people would understand what was happening. They would demand changes.

Her best friend, Dorothy, warned her, “The companies



that make insecticides will hate you if you write this book. They’re rich and powerful. They’ll do anything to turn people against you.”

“I understand that, Dorothy,” replied Rachel, “and I will be expecting it. But knowing what I do, there would be no peace for me if I kept silent. I could never again listen happily to a thrush song.”



She named her book *Silent Spring*, because there would be no bird songs if all the birds are killed by insect poisons. There will be no people left to hear them either, because those chemicals could end all life on Earth.

As she worked on *Silent Spring*, she learned that she had cancer, and it could not be cured. She was in pain and sometimes could hardly walk. Now she raced against time to finish her book.

Some things that Rachel wrote about in *Silent Spring*:

• The bald eagle, the symbol of the United States, was becoming extinct because DDT prevented the



eagle's eggs from hatching.

☛ A chemical that was sprayed over many acres in Illinois to kill Japanese beetles had also killed thousands of squirrels, rabbits, muskrats, birds, and cats.

☛ Poisons actually make insects even harder to kill, because the ones who survive then mate and breed “super bugs.” This is called becoming resistant to the chemical. Then chemists have to make even deadlier poisons.

☛ A chemical such as DDT does not just disappear after it is sprayed. DDT sprayed on alfalfa shows up in cow's milk after the cow eats the alfalfa. Rain carries it into rivers and out into oceans, where it gets into fish, oysters, crabs, penguins, seals, and other creatures. DDT sprayed in the United States ends up in Iceland, Japan, the Arctic, the Antarctic—everywhere.

When Rachel finished *Silent Spring* in 1962, she cried with relief. All she wanted to do was rest.

Her book shocked the whole

world. The companies who made the insecticides were enraged. They fumed, “Rachel Carson is just a nature nut!” They made up lies about her and spent thousands and thousands of dollars trashing her on the radio and on TV, and in newspapers and magazines.



So Rachel couldn't just rest after all. She had to go on television to debate men from the government and big chemical companies. This was a hard thing for a shy person to do, especially since she was sick.



She did it because she knew that TV would reach even more people than her book. Her voice was soft, but firm. She knew exactly what she needed to say and how to say it.



She warned, “People talk about conquering nature, but people are a part of nature. What we do to nature we do to ourselves. The war against nature is a war against ourselves.”



President John F. Kennedy read *Silent Spring*. He called for a special committee of top scientists to study the facts and decide who was right—Rachel Carson or her enemies.

The committee announced that everything Rachel had written was true.

Congress passed new laws to protect the environment.

One law banned DDT in the United States. That saved eagles from extinction. People began to think about taking care of the Earth.

Rachel was awarded many medals, but she was too sick to go to all the places that wanted to honor her.

One day she and Dorothy sat on a rocky cliff in Maine, watching monarch butterflies migrate to

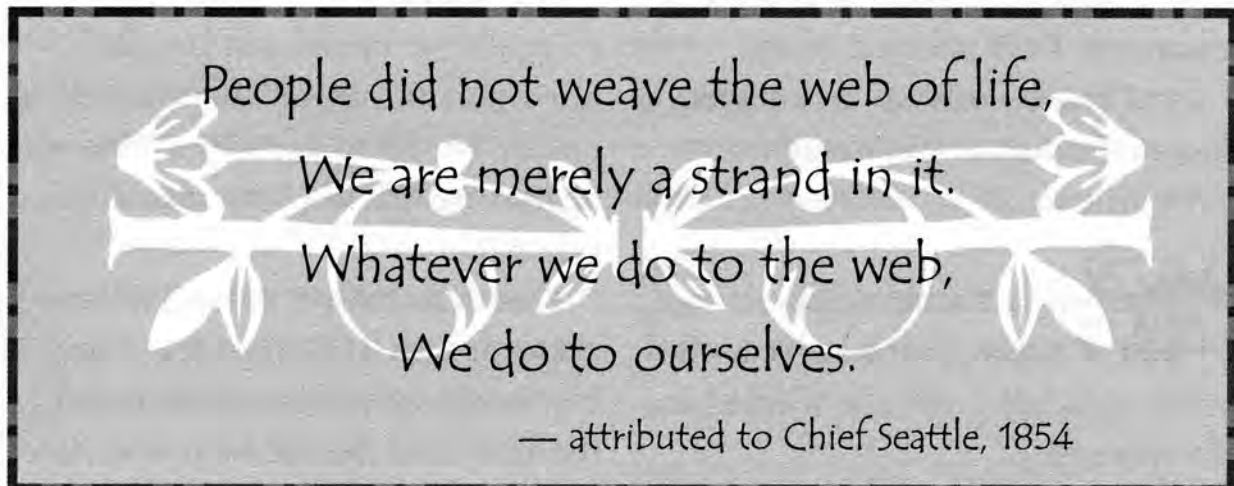


“What we do to nature we do to ourselves.”

Mexico for the winter. They knew that those butterflies would not live to return to Maine, but their offspring would come. That was the natural life cycle of a butterfly. Rachel

thought about that. Later she wrote, “Those fluttering bits of life taught me...that it is a natural and not unhappy thing that a life comes to an end. I have deep happiness in knowing that.” Soon after that she died.

Rachel Carson will always be remembered for her courage in protecting the Earth, and for showing us how we are part of a wonderful web of life.



A Strange Tale
Cats, Rats & Bugs
in Borneo

It Really Happened!



It all started with
mosquitoes
and flies.

The kind of mosquitoes on the hot, steamy island of Borneo can infect people with malaria, a deadly disease. The mosquitoes breed in Borneo's swamps and rainforests. So

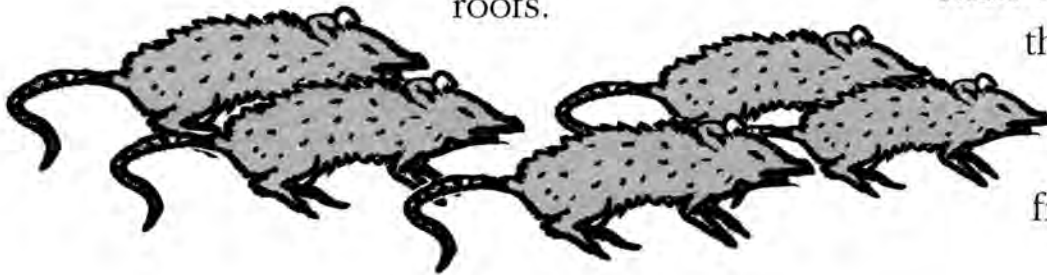
some years ago, the World Health Organization decided to get rid of the mosquitoes by spraying the island with great quantities of an insect poison called DDT.

Soon after the spraying, a weird thing happened: the thatched roofs of houses



began collapsing.

Hundreds of caterpillars were devouring the roofs. There had always been caterpillars around, but not many, because a certain kind of wasp ate them. But the DDT killed the wasps along with mosquitoes. The caterpillars were not affected much by the DDT. So, without wasps to stop them, they munched and crunched and chewed up the roofs.

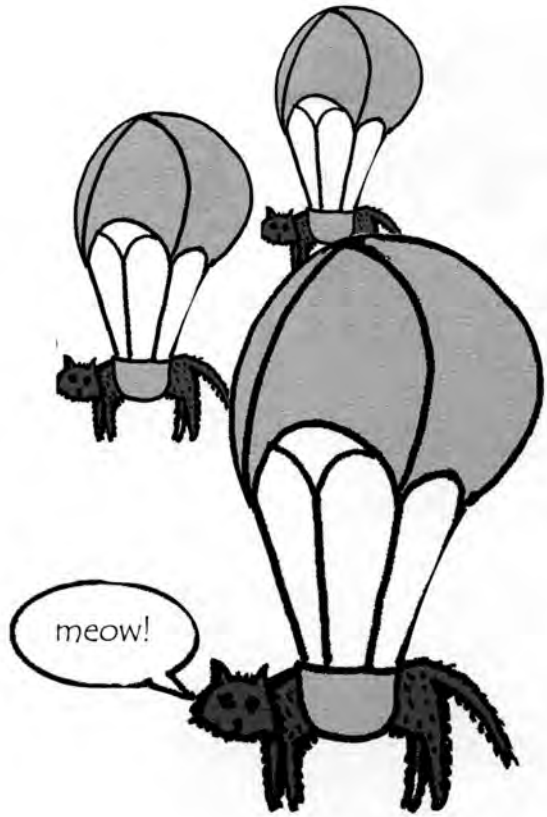


But that is only the beginning of this tale. DDT was also sprayed inside the houses to kill houseflies. Now, killing houseflies had always been the job of little lizards called geckos. Geckos can scoot up and down walls and cling to ceilings when they hunt for flies, because they have tiny suction pads on the bottom of their feet. People in Borneo liked having geckos running around inside their houses, gobbling up insects. They always said that a gecko brings good luck.

The DDT killed houseflies, just as the World Health Organization had planned. But geckos ate the dead houseflies and then *they* died too, from the DDT in the bodies of the flies.

Then house cats ate the geckos.

The poor cats died from the DDT



new cats into Borneo to catch the rats!

Geckos, cats, rats and roofs! And to think it all started with mosquitoes and flies.

By the end of this true tale, people discovered this: Each thing that happened made something else happen, because all living things are connected like the strands in a web—A WEB OF LIFE!

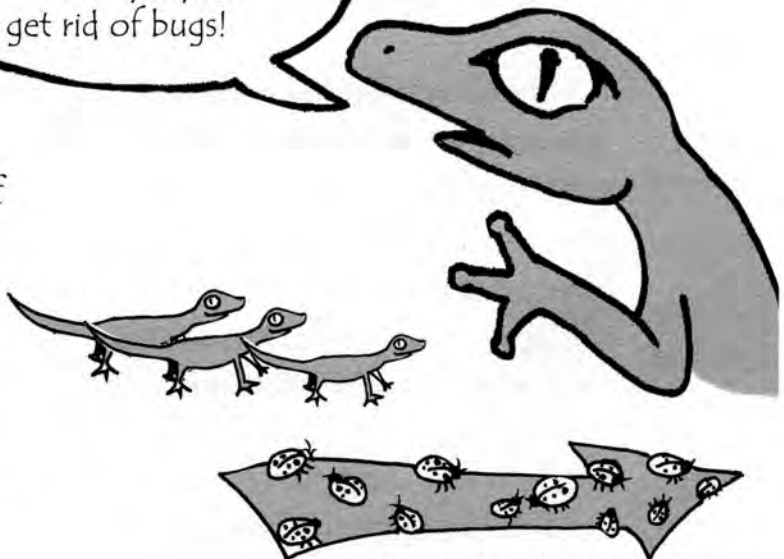
We can learn good ways to protect ourselves from the few kinds of harmful insects, BUT...

inside the flies inside the geckos.

After that, rats sneaked into houses, because there were no cats around to stop them. They ate up people's food. Worse than that, some of the rats carried a disease that was even more deadly than malaria.

This alarmed the World Health Organization so much that finally they parachuted

But folks are still messing up the environment when they try to get rid of bugs!



Read "No Peace in Keeping Silent" to find out more.

Children, inside all day at school, and parents, inside all day at work, can nourish their 'sense of wonder' outdoors on the weekend.

When you stay inside and watch TV, even if you watch nature shows, you only see what someone else thinks is important about nature. Find out for yourself-about birds, for example.

FAMILIES AND FRIENDS TRY THIS TOGETHER!

Get up just before sunrise one day and go outside to see what birds you can see and hear. To be successful:

- Dress warmly (in chilly weather) in quiet (clothes can rustle), dark clothes.
- Stand with your back to the rising sun so you can see the birds.
- Be as quiet as possible and move slowly and gently when you need to move. Don't even turn your head suddenly.
- Try attracting the curiosity of birds by making a sound by kissing the back of your hand with tight lips. The air going through your tight lips against your hand makes a bird-like sound.
- If a bird appears, don't take your eyes off it until it moves out of sight. Notice as much as you can about it
- Try watching birds through binoculars if you have them to see more detail. It will take practice to locate birds quickly and focus on them so don't give up.

In late fall when the trees and shrubs have lost their leaves, look for abandoned nests.

- A good nest to look for is that of the Northern Oriole: it looks like a woven bowl dangling from a slender stalk high in the tree tops.
- Nest boxes may be hung to encourage birds to nest in your yard. Many birds, including house wrens, like to nest in cavities and will use an artificial home.
- Find a book on bird nests in your library or a book store and identify the nests you have spotted.
- Notice what materials the nests are made of and begin collecting materials that you could offer to the birds in the spring to encourage them to nest near your home, (**Caution:** Approaching an active nest may alert predators to the nest or cause it be abandoned.)

Listen to bird songs and try to find words to fit them. Some easy ones are the Chickadee that calls his own name – “chickadee dee dee,” the Carolina wren that says “tea kettle, tea kettle, tea kettle”, or the Northern Cardinal that says “What Cheer, Wheat, Wheat, Wheat” and “Purty, Purty, Purty.” It will probably take time to learn the calls well enough to find words to fit them.

HERE ARE SOME HELPFUL BOOKS:

For Adults or Older Children:

- Stephen W. Kress, Ph.D., *Bird Life: A Guide to the Behavior and Biology of Birds*, Golden Press, 1991 (good overview)
- George Laycock, *The Bird Watcher's Bible*, Doubleday, 1994
- Peterson, Golden or National Geographic bird guides
- Stokes nature guides

For Younger Children:

- Robert Snedden. *What Is a Bird?*, Sierra Club Books for Children. 1992
- Olive L. Earle, *Birds and Their Nests*, William Morrow & Co., 1952
- Thane Maynard. *Saving Endangered Birds: Ensuring a Future in the Wild*, Franklin Watts, 1993



Written by Martha E. Collins

Wetlands of wonder & worth

Brown cedar water gurgles around the cypress knees, a frog crawls up onto a lily pad, “Conkeree” call the red-winged black-bird perched up where he can spy his rivals; the great blue heron watches calmly as a school of shiners escapes to deeper water, mayflies spin through the air in search of mates, a turtle suns himself on a log, a mallard duck pair takes a rest from feeding...

What is a wetland? As a child I walked home from school past an intriguing wood with a brook flowing through it. In the spring the ground there was partly under water because of all the rain and it was full of the high, silvery chorus of spring peepers. Later I learned that these tiny tree frogs return every year to such vernal pools of their birth to sing for a mate. A temporary, seasonal wet spot or vernal pool like this is only one kind of wetland. Other wetlands include marshes, bogs and swamps. They are often, but not always, found along open water such as lakes, ponds, streams and rivers, bays and along the seashore.

Could kids visit a wetland? Yes and it's a good idea. Wetlands are chock-full of fascinating wildlife. • The best time to see animals is very early in the morning. If you don't see them you may see their tracks in the mud, a feather, scat (animal excrement) or tracks through the grasses. Silence is the key to seeing and hearing wildlife. Watch where your shadow falls and try to approach open water so that your shadow does not get there first and scare the fish. Water plants, marsh plants, shrubs, trees, insects, fungi, mosses and wildflowers are easier to see. You will hear birds and may see some; perhaps a Red-winged Blackbird or Great Blue Heron. • Visit at different seasons to learn more. • Consider bringing: boots; binoculars; a camera; drinking water; a trash bag; a water-proof cushion to sit or kneel on; and a magnifying glass. • If you get in touch with a local naturalist at a nature center or local conservation organization, you can get good advice about where to visit a wetland that has board walks over the wet parts or a guided tour. You can also learn what to watch for and what to watch out for. • Using mainly your eyes and ears when visiting natural areas is the least disruptive way to learn about them. Think of the natural environment as someone else's home. If you do move anything, be careful to put it back where you got it and not to do damage.

Other wetland activities? Learn to recognize local wetland plants and animals, such as cattails and mallard ducks, from a distance. Then as you go about your daily life notice and write down where there are wetlands in your area. Are there any along your bus route to school? • Get a detailed local map and find all the streams in your area. Wetlands are often found along streams. • Create your own Wetlands Species Spotters List on your region's wetlands. Then, with your friends, try to get to see examples of each species in the wild.

What kind of wetlands wildlife do you see in this picture? Actually the species illustrated here are an amalgam of wetlands and open water species, though most can be found in an Eastern U.S. swamp or stream.



Beaver lodge, bald cypress tree, red-winged black-bird, frog, mallard duck pair, broad-leaved cattails, spotted salamander, grey fox, shiners, dragon fly, mud turtle, great blue heron, water lilies, arum, frogbit, sedges, grasses and indicative of clean water, may flies, mayfly larvae and caddisfly larvae.

If You Plant it they will come...

Insects that eat other insects (beneficials) help us in the garden by keeping the numbers of pest insects down. If we use pesticides routinely, we can kill both kinds of insect. Beneficial insects need to have certain plants for various stages of their life-cycle. We can work with nature and attract more beneficial insects by including some of the plants listed below in our gardens. **KIDS, SEE IF YOU CAN IDENTIFY THE INSECTS BELOW.** Find more pictures in the books listed below.

BENEFICIAL:	FAVORITE PREY:	FAVORITE PLANTS:
Braconid Wasp	Aphids-hornworms-cutworms- imported cabbageworms-beetle larvae-gypsy moths-codling moths-tent caterpillars	An early spring to fall wildflower assortment; nectar-producing flowers with open, single blossoms
Ichneumon wasp (or fly)	Caterpillars-borers-wood-boring larvae-spiders	Same as above
Lacewing	Aphids-thrips- whiteflies-leafhopper nymphs-corn earworms-mites-scales-mealybugs	Angelica-goldenrod-Queen Anne's lace-red cosmos-tansy
Ladybug	Aphids-rootworms-whiteflies-weevils-chinch bugs-Colorado potato beetles-mealy bugs-scales-spider mites	Angelica-butterfly weed-euonymus-marigold-tansy-buckthorns-yarrow
Praying Mantis	Aphids-bees-beetlesbugs-butterflies-caterpillars-leafhoppers-flies-wasps (anything smaller or slower than itself)	Cosmos-raspberries-other brambles
Syrphid Fly (or hover fly)	Aphids-mealybugs-leaf hoppers-scales	Spearmint-cosmos-baby blue eyes-Gloriosa daisies-marigolds
Tachinid Fly	Cutworms-sawflies-Japanese beetles-Mexican bean beetles-corn borers-gypsy moths-grasshoppers-many caterpillars	Wild buckwheat
Trichogramma Wasp	Cutworms-army worms-cabbage loopers-cabbageworms-hornworms-corn borers-codling mothsfruitworms-cotton boll-worms-leafworms-and more	Same as for braconid wasp



FOR MORE INFORMATION: 1) *The Healthy Garden Handbook: An Illustrated Guide to Combatting Insects, Garden Pests, and Plant Diseases* by the editors of *Mother Earth News*, published by Simon and Schuster, Inc., 1989; 2) *Stokes Nature Guides: A Guide to Observing Insect Lives*, Donald Stokes. Little Brown & Co., Ltd., 1993; 3) *Rodale's Garden Insect, Disease & Week Identification Guide*, Miranda Smith and Anna Carr, Rodale Press, 1988; and 4) *Organic Gardening*, (April 1990 and May/June, 1991), Rodale Press.

Written by Martha E, Collins

ANSWERS
1. Lacewing
2. Praying Mantis
3. Tachinid fly

source of wonder, source of strength - Our Wildlife Workforce

“All these small creatures are working - working in sun and rain, during the hours of darkness, even when winter’s grip has dampened down the fires of life to mere embers. Then this vital force is merely smoldering, awaiting the time to flare again into activity when spring awakens the insect world.” (p. 251, *Silent Spring*)

Although Rachel Carson was referring to insects in this case, wildlife as a whole represents a vital force. In order for this force to continue successfully it needs our help through creation of a planetary partnership to conserve and protect the work of wildlife.



Not only does nature sustain us physically, it can also engender in us, if we allow it, a *“ ... sense of wonder so indestructible that it would last throughout life, as an unfailing antidote against ... alienation from the sources of our strength.”* (*The Sense of Wonder*)

This source of wonder and strength so precious to Rachel Carson is today threatened by the very practices against which she struggled. Pesticide use continues to contaminate our planet, reducing nature’s essential services.

The functioning ecosystems that we rely on for clean water, clean air and healthy food consist of plants producing oxygen and removing carbon dioxide, insects and others pollinating plants, insects (like dragonflies) controlling pests (like mosquitoes), as well as insects and fungi recycling organic matter. In addition there are the microbes, which as Rachel Carson wrote, *“... include not only disease organisms but those that destroy waste, make soils fertile, and enter into countless biological processes ...”* (*Silent Spring*, p. 289).

Pesticide Problems Continue

With its egg shell thinning and resulting declines of Bald Eagle, Peregrine Falcon, Pelican, Osprey, and Cormorant populations, DDT remains a familiar story. Since Rachel Carson’s eloquent plea for protection of wildlife in *Silent Spring* was followed by the ban on DDT and other organochlorines, many people came to believe that pesticides were effectively eliminated as hazards for our own wildlife.

Today, unheeded by many Americans, migratory birds are threatened directly by insecticides acting as nerve poisons and by rodenticides with various toxic modes in the US and abroad. Indirect harm can result from various pesticides reducing birds’ food and habitat. Some of these indirect

threats can take decades to uncover. Such was the case with the link between the herbicides applied to fields and the elimination of the partridge populations from the grain-growing farms in Sussex, England. The association was established through studying data collected over a 30 year time span. Experts are starting to try quantifying not only the immediate mortality from pesticides but also the long term changes that can lead to reduced reproduction and population decreases. At a recent meeting in Laurel, Maryland a single organophosphate insecticide, carbofuran was estimated to kill 34 million migratory birds yearly when both direct and indirect toxic actions are considered (Dr.R. O'Connor, at "Pesticide Effects on Birds: Beyond the Tip of the Iceberg"). Based on direct toxicity alone scientists estimate that carbofuran can kill between 8 and 9 million birds yearly.

Incident reports and application information have resulted in estimates of wildlife fatalities from pesticides and include: 72 million bird deaths at a cost to society of over \$2.1 billion annually (personal communication, 2001); and 14 million fish deaths at a cost of \$56 million. The estimated cost to society from pesticides' damage to insects both those that are pollinators as well as those that are the natural enemies of pests is given as \$700 million annually (Dr. David Pimentel, Keynote address, Wildlife Pesticides and People Conference).

Wildlife Working Under the Pesticide Threat

Without requiring payment for services wildlife workers can create healthy ecosystems. Here are some examples of their contributions and the chemical pesticides that reduce their effectiveness.

Mycorrhizal fungi: These organisms live in the roots of plants where they help with nutrient assimilation and contribute to soil fertility. They can be poisoned by fungicides and herbicides.

Wild cherry trees: Listed among the top 5 woody plants of importance to wildlife, these trees serve as sources of nectar and food for wildlife. Through their branches they provide windbreaks and shade. Through their roots they help stabilize the soil and protect from erosion. A new type of low-dose herbicide from the sulfonylurea class has been found to reduce the trees' ability to reproduce and produce seeds with scarcely any other evidence of injury. This has been found to occur with levels of a sulfonylurea at 1/500th the recommended dose. Commercial growers have reported crop losses after the introduction of sulfonylurea-type herbicides.

Wild bees: These are among the organisms providing pollination, an essential service to seed-bearing plants. One third of all human food is dependent on pollinators. Most insecticides are harmful to bees and indicate so on their labels. Herbicides can damage bee communities by destroying nectar sources.

Copepods: Tiny zooplankton such as the water flea comprise this highly valuable group. These animals feed on phytoplankton, and insects (including mosquito larvae). They also serve as food sources for other animals. Five copepod species make up 95% of the biomass of the Chesapeake bay. Certain copepods can be killed by organophosphate insecticides such as chlorpyrifos and diazinon at parts per trillion levels. Copepods are among the most vulnerable organisms to pesticide poisoning.

Parasitic wasps: These are predators that do not sting humans but can effectively control caterpillars, borers and tomato hornworms by laying eggs in the body cavities of these pest insects. Many chemical insecticides harm the parasitic wasps and other beneficial insects. Herbicides can also destroy the food sources and habitat for the intermediate life stages of these natural enemies.



Neotropical migratory songbirds: “Unsung heroes of northern forests protecting them from foliage-eating menaces” is how Dr. Russ Greenberg describes this group of beautiful and useful birds. In addition they delight us with their songs. Baltimore orioles, among the sweetest of singers, are also capable of destroying whole colonies of tent caterpillars- that are said to comprise 35% of the birds’ diets. In the field through directly encountering pesticide spraying or eating poisoned food, songbirds can be killed outright. Non-fatal exposures can alter critical responses including predator avoidance, feeding habits, reproduction and other behavior essential for survival. Orioles have been deprived of essential winter habitat in Central

America where coffee grown without the shade of tall trees, requires synthetic pesticide and fertilizer input. Rachel Carson Council’s brochure, “A Bird Lover’s Guide to Good Coffee,” calls for the purchase of shade-grown organic coffee by all those who cherish these wonderful creatures.

Salmon and other fish: As adults, fish serve as food for humans and other animals. Fresh water fish eat mosquito larvae. In their early life stages they are food for other aquatic animals. Of the 18 major lawn care chemicals, 85 % are toxic to fish (according to the *Basic Guide to Pesticides*). From the most recent EPA data on pesticide use, of the top 10 chemical pesticides used in agriculture 90% are toxic to fish (according to the *Basic Guide to Pesticides*).



Salmon can be harmed by the commonly-used insecticide, diazinon at concentrations in the water too low to be lethal. At such levels diazinon can actually damage the salmon’s ability to avoid predation and to return to the streams of their ‘birth through their legendary homing ability. These water concentrations of diazinon do not produce easily detected changes in the fish. Frsh are considered as the third most vulnerable group of animals in terms of chemical pesticide toxicity after insects and crustaceans.



Oysters: They are a food source for humans and for other members of the ecosystem. It has been estimated that before 1880 resident oysters in the Chesapeake Bay were able to filter all the Bay’s water in 2-3 days. In 1988 the time required for oysters to provide the same service was estimated at 325 days or 100 fold longer (RCC News #91, p.8). In a recent report in the journal, *Science*, oysters were desig-

nated as being the controlling species in the Chesapeake Bay, the organisms on which the health of the Bay is most dependent (Jackson, J. et al, “Historical overfishing and the recent collapse of coastal ecosystems,” *Science*, V293, 7-27-2001, pp 629- 638). One of the most widely used herbicides, atrazine, may inhibit the growth of a type of phytoplankton serving as a food for oysters. The herbicides simazine and 2,4,D are moderately toxic for oysters (*Basic Guide to Pesticides*). All of those pesticides mentioned above have been found in the Chesapeake Bay or its tributaries.

We need to make sure there are healthy workplaces free of the chemicals—that can stop this “vital force” from working ... Ultimately, we are far better served with wildlife doing the jobs they have performed for eons than with technological substitutes that can be less successful and are ultimately more costly.

Toxicity studies by which pesticides are evaluated before registration can fail to detect the actual conditions under which wildlife encounter these contaminants or their ecosystem impacts. The regulations under which pesticides are registered may allow environmental effects that are detected to be disregarded.

The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) the law under which pesticides are registered is an administrative act designed to regulate the use of toxic pesticides for the purpose of promoting the economic interests of agriculture. FIFRA allows registration of chemicals if they “will not generally cause unreasonable adverse effects on the environment.” The decision on whether or not to register a pesticide is made not by scientists but by managers who can ultimately disregard the hazards to wildlife if they deem the chemical’s benefit to agriculture overrides its risk.

Taking our cue from Rachel Carson, citizens remaining mindful of the sources of wonder and strength in the natural world need to create a planetary partnership protecting the earth’s wild workers so that our own society with its human workforce can be sustained.

Diana Post, VMD

How You Can Help (To Protect Your Family and the Earth)

1. Get information on pesticides from the Rachel Carson Council.

Use the contact information below to write, e-mail, or call us and ask for our school pesticide information packet.

2. Ask your family to use organic fruits and vegetables.

“Organic” means food that is grown without chemical pesticides. You can buy them at organic markets or in organic vegetable sections in big supermarkets. Ask your family to start an organic garden in your backyard.

3. Ask your family not to use pesticides in your home, yard or garden.

Remind them that toxic pesticides can be very harmful to kids. They may also be dangerous for pets and wildlife that visit your yard. Remember, NEVER touch pesticides or their containers!

4. Learn about good insects and how they can be garden helpers.

Look in the library for books on gardening and how to identify beneficial insects. Helpful insects are ones that eat the bad insects that feed on your plants, and ones that pollinate plants.



5. Be a “bug” detective!

Once you’ve learned which bugs are helpful and which ones are harmful you can patrol your house and garden looking for them.

6. Grow plants that are favorites of birds, butterflies and helpful insects.

Certain plants are good nesting places for birds. Others plants provide nectar (food) for helpful insects and butterflies, or berries for birds - many of these critters eat the bad bugs.

7. If your family has a garden, offer to help take care of the plants.

Plants are living things! If they stay healthy they can fight off diseases and harmful insects. You can help keep them healthy by offering to work in the garden.



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More Ways to Help!

8. Clean up after your snacks in the house.

Did you know that one cockroach can live for a long time off even one grease smudge? If you clean up crumbs and food waste you'll be helping your family to reduce insects in your home.

9. Do a school project on pesticides and alternative pest controls.

Using what you've learned from the Rachel Carson Council and from library books, do a school report or project on the harmfulness of pesticides. Point out alternatives you can use to keep your home, yard, and garden pest free or to keep your family from being exposed to toxic chemicals. Do a show and tell about being a "Bug Detective" bringing samples of beneficial bugs.

10. Read and learn all you can about pesticides and wildlife.

Rachel Carson was very concerned about the dangers of pesticides to wildlife. Through her book, *Silent Spring*, she helped save the American Bald Eagle. This bird had been almost wiped-out because of the pesticide DDT, which is no longer sold in our country. Today, other animals are in being hurt by toxic pesticides. Do a school or Scout badge project on this problem.

11. Write a letter to your member of congress asking for stronger pesticide laws.

There are many pesticides that should not be sold for use on home lawns and gardens. Many need labels added to the cans to let families know how to use them safely. You can help by asking your congressmen-and-women to make the laws stronger.

12. Take the Rachel Carson Pledge!

Rachel Carson wrote a pledge for protecting the Earth, and the wildlife that live here with us. You can take Rachel Carson's pledge to improve the way we treat the environment:



"I pledge myself to preserve and protect America's fertile soils, her mighty forests and rivers, her wildlife and minerals, for on these her greatness was established and her strength depends."

By: Rachel Carson, 1946

Signature

Date

Rachel Carson Council Presents

Test your Knowledge

Mark the following statements true or false:

- _____ 1. In order to have a nice green lawn, it is necessary to use a lot of chemical herbicides and insecticides.
- _____ 2. All insects in your garden are harmful.
- _____ 3. It is all right to spray pesticides at night because birds are asleep.
- _____ 4. Tent caterpillars are an important food source for Baltimore orioles and other birds.
- _____ 5. Honeybees are very useful in the environment.
- _____ 6. Emptying birdbaths every 4 days is one step in mosquito control.
- _____ 7. Unused chemical pesticides can be safely disposed of by flushing them down a storm drain or a toilet.
- _____ 8. Granular pesticides used on lawns and gardens, could be eaten by birds and may harm them.

(Answers are on the next page)

Answers to Test your Knowledge

- 1. False.** A lawn can be kept green and healthy without use of chemical herbicides (plant killers) and insecticides (insect killers). Some steps to a healthy green lawn are:
 - cut your grass to a height of at least 3 inches - with a sharp mower blade,
 - use a mixture of grass types to increase the lawns' resistance to draught and other problems,
 - use a corn gluten product to help eliminate most weeds,
 - aerate the soil where it has become compacted,
 - "problem" areas of lawn and garden should have their soil tested so a special plan can be designed for them, and
 - lawns and gardens maintained without chemical pesticide use, help birds to stay healthy.
- 2. False.** Only a few kinds of insects are harmful in the garden. Many beneficial insects help by eating these harmful insects and thereby keeping their numbers small — reducing the damage they can cause. Other beneficial insects help your lawn and garden grow by pollinating flowers and recycling organic matter. Insects are an important food source for baby birds.
- 3. False.** The decision to use chemical pesticides at night does not protect birds from pesticide hazards. Pesticides sprayed at night may end up in the dew, which serves as drinking water for many creatures, who are not the targets of the spray. Birds can drink water contaminated by pesticides and become sick. They can also eat berries from pesticide contaminated plants. Pesticide-contaminated insects can poison birds that depend on them for food.
- 4. True.** Baltimore orioles and other birds may eat thousands of tent caterpillars in a day. Thirty-five percent of the oriole's diet can be tent caterpillars. "The average pair of [oriole or other songbird] parents removes caterpillars from more than a million leaves in the ten days it takes to raise a nestful of babies to fledging [being ready to fly]." (Greenberg & Lumpkin, *Birds over Troubled Forests*, Smithsonian Institute 1991)
- 5. True.** Honeybees do several tasks that benefit other living organisms. They help pollinate the flowers of many kinds of fruit-bearing plants. Birds that eat fruit, grain and berries are among the many animals that benefit from the pollinating work of bees.
- 6. True.** Mosquito larvae, the young, wingless forms of mosquitoes, can be found in small basins of undisturbed water, outdoors, such as birdbaths, small puddles in gutters, old tires, tin cans, etc. Under ideal conditions it takes at least 5 days for a mosquito larva to grow from an egg to its adult form ready to leave the water. If birdbaths are emptied every 4 days then the larvae in them will not have enough growing time to become adult mosquitoes - able to bite other creatures including birds, and spread diseases. Since mosquitoes generally do not travel very far in their lifetimes, their population can be kept down by simple measures such as regularly emptying birdbaths and other containers of water.
- 7. False.** Left over pesticides are toxic substances. Storm drains are large-sized drain pipes that run from streets to nearby creeks. Dumping pesticides into storm drains is the same as dumping pesticides into creeks. Once there, they may kill off fish and beneficial water insects, or poison the plants living downstream. These pesticides may travel further, into rivers, possibly contaminating our own source(s) of drinking water, and on into the Chesapeake Bay, harming the creatures that live there, including some that serve as food or provide important services for people and birds.
- 8. True.** Certain birds eat not only seeds but small pebbles (known as grit) as well. These pebbles remain in their gizzards and are used to grind up seeds into small particles that the bird can then digest. If granular pesticides are eaten, they may end up harming the bird, making the bird an unintended target of the pesticide use.

Trivia Questions on Rachel Carson

- 1) Where was the birthplace of Rachel Carson?
- 2) What are the dates of Rachel Carson's birth and death?
- 3) What is the name of Rachel Carson's adopted son?
- 4) Who was the US President when *Silent Spring* was published?
- 5) To whom did Rachel Carson dedicate *Silent Spring*?
- 6) Name three birds of prey that were harmed by DDT.
- 7) When was the US Environmental Protection Agency founded; and was Rachel Carson alive at that time?
- 8) Which US President gave Rachel Carson the "Medal of Freedom?" Was it
(a) John F. Kennedy, (b) Richard Nixon, or (c) Jimmy Carter?
- 9) What is the title of the last chapter of *Silent Spring*, and what is the focus of the chapter?
- 10) When was DDT banned in the US and has it ever been banned worldwide?

(Answers are on the next page)

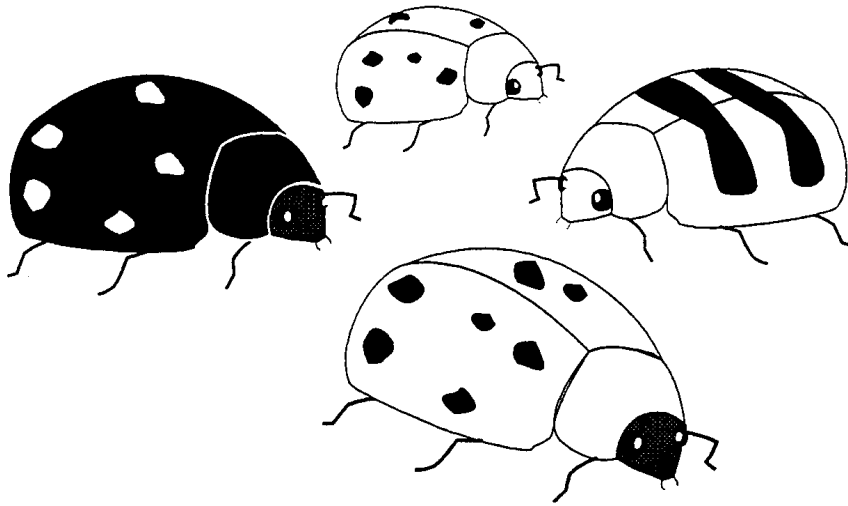
Answers to Trivia

"Questions of Rachel Carson"

- 1) Rachel Carson was born on a farm in Springdale, Pennsylvania - on a high ridge overlooking the Allegheny River. Springdale is near Pittsburgh, Pennsylvania.
- 2) Rachel was born on May, 27, 1907 and died on April 14, 1964.
- 3) Roger Christie.
- 4) John. F. Kennedy.
- 5) Dr. Albert Schweitzer.
- 6) Bald eagles, Peregrine falcons, Ospreys.
- 7) 1970, No.
- 8) (c) Carter.
- 9) "The Other Road." It describes various biological alternatives for controlling pests, such as beneficial insects, bacteria, and use of traps, in place of pesticides such as DDT and other toxic chemicals. Many of the biological controls mentioned in "The Other Road" are still being used-mostly by organic farmers.
- 10) DDT (dichloro,diphenyl,trichloroethane) was banned for most uses in the US in 1972. It has never been completely banned worldwide. According to the Stockholm Convention Treaty on Persistent Organic Pollutants (POPs Treaty), first signed by 93 countries in 2001, DDT is not allowed for most uses but still can be used against malaria mosquitoes in a country that applies for permission to do so.

Ladybugs - Beautiful and Helpful

To find out what colors to color these ladybugs, read fact number five .



1/4"

Actual Size

1. Ladybugs help us by eating insects that harm plants we like and need. Here is a list of some of the insects they eat:

- aphids
- asparagus beetles
- rootworms
- whiteflies
- weevils
- chinch bugs
- Colorado potato beetles
- mealy bugs
- scales
- spider mites

They eat the eggs and larvae of many insects but they like aphids best.

2. Ladybugs that were hatched at the end of the summer spend the winter hibernating in garden trash and leaves. When it warms up they wake up hungry. After they have eaten they begin laying eggs.

3. Ladybug eggs are colored yellow-orange and are found on the bottoms of leaves, on tree bark, on plant stems or on leaf litter on the ground.



4. When ladybug larvae hatch from their eggs they begin to eat even more insects than their mothers. The larvae look different from the ladybugs. Ladybugs can eat as many as 5,000 aphids in their lives.

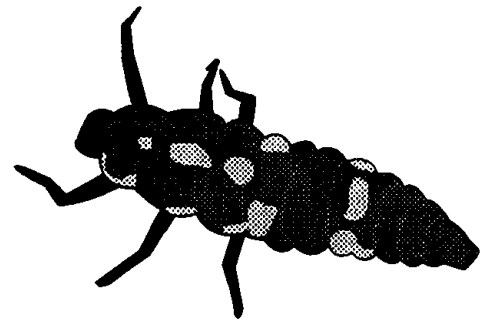
5. Some ladybugs are black with red spots, some are red with black spots and some are grey with black spots. But don't get mixed up!

Mexican bean beetles look like ladybugs except that they always have 16 spots and are yellowish brown. Mexican bean beetles eat beans, not other bugs.

6. Ladybugs are sometimes called lady beetles or aphid wolves. They were named after "Our Lady," (Mary, the mother of Jesus) by farmers in the middle ages who were grateful for the help these beetles gave to protect the grape vines.

7. We can help our ladybug friends by:

- a) Planting plants they need for part of their life-cycle such as parsley, dill, caraway or tansy
- b) Making sure water is available (sprinkle some on the leaves if the weather gets too dry).
- c) Raking up the garden in the spring, not in the fall, so the ladybugs can use the leaf litter to hibernate.
- d) Keeping the garden mostly free from insecticides.
- e) Not killing or disturbing the eggs or larvae of the ladybug.



1/4"

Actual Size

Resources:

Much of this information is taken from: *The Healthy Garden Handbook: An Illustrated Guide to Combatting Insects, Garden Pests, and Plant Diseases* by the editors of *Mother Earth News*, published by Simon and Schuster, Inc., 1989. Other excellent sources of information include *Stokes Nature Guides: A Guide to Observing Insect Lives*, Donald Stokes, Little Brown & Co., Ltd., 1993, *Rodale's Garden Insect, Disease & Week Identification Guide*, Miranda Smith and Anna Carr, Rodale Press, 1988 and *Organic Gardening*, (May/June, 1991), Rodale Press.

A True story About Lady Bugs

Once there was a grandmother who liked asparagus. It may seem silly, but she really loved it. She wanted lots and lots of it for breakfast with her eggs. She wanted it on toast with cheese for her lunch and she wanted it with a special lemon sauce on it at dinnertime. Now asparagus is very expensive. Sometimes it costs \$4 a pound at the grocery store. So she decided to plant some in her front yard so she could have as much as she wanted.

When you plant asparagus you have to let it grow and get strong for two years before you can cut any of the green shoots in the spring. So she waited impatiently for two years to harvest her very own asparagus shoots.

The third year when the young shoots came up she had an nasty surprise. Some asparagus beetles came along at the same time. They had green wing covers with black spots. Their little eggs pointed out from the stems. Soon the eggs hatched and black larvae moved slowly over all the new shoots eating the surfaces of the stems. They munched up every tasty little shoot. How frustrating!

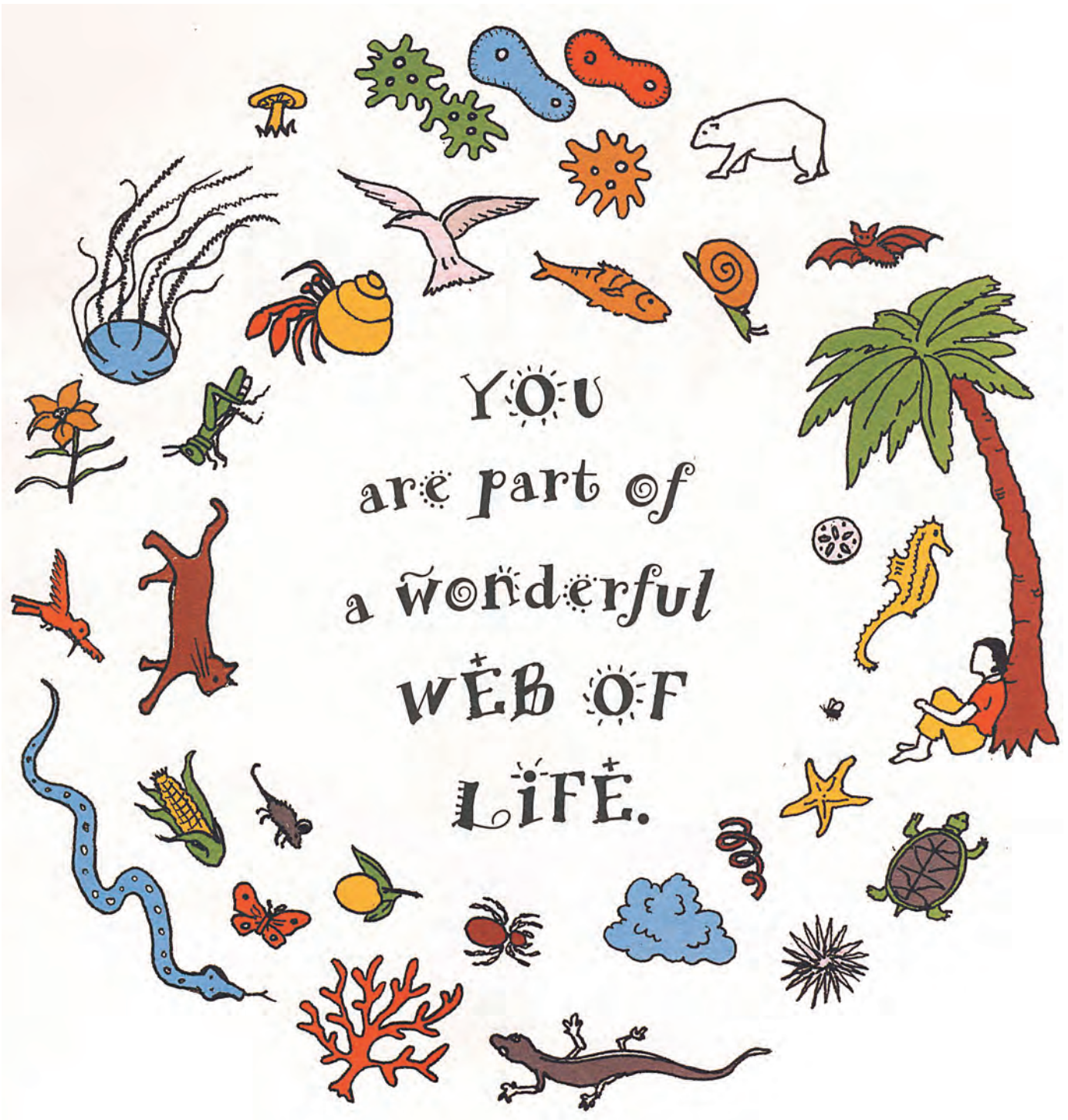
This grandmother did not believe in using pesticides to solve garden problems. She knew that somewhere in nature there was a creature who would want to eat these beetles. Her friend at the organic farm told her that **ladybugs** might want to munch those tasty asparagus beetle eggs and larvae and he told her what she could plant to get the **ladybugs** to come to her garden.

She planted purple and orange cosmos, yellow yarrow, parsley, dill and tansy and by the end of the summer there were many more **ladybugs** visiting her garden. The **ladybugs** also ate the aphids on her roses. In the fall the last **ladybugs** of the summer burrowed down and hid in the leaves to hibernate. They wanted to be ready to wake up and eat the asparagus beetles again in the spring. Eventually there were so few asparagus beetles that the lady got to eat all the asparagus she wanted. She even gave some to her grandchildren!

Ladybugs are part of a group of insects called “beneficials” that help us in our gardens by eating the insects that eat our garden plants. If we choose to use pesticides, we will probably kill the helpful bugs along with the “pests.” But the pests usually come back faster than the helpful bugs and then we have more pests and fewer helpers. The best way to work with nature is to make the helpful insects feel at home and they will do the work for us.

Draw your own picture for this story below.

Notes



From the *Kid's Book of Awesome Stuff*



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