

LOOKING at LIFE on EARTH

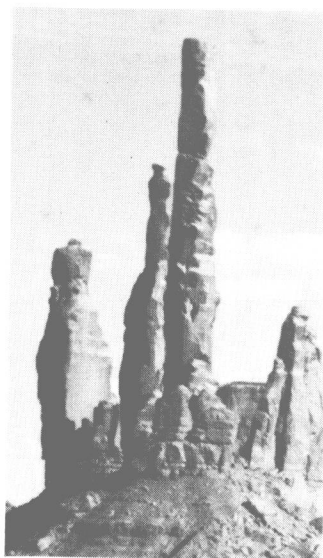
N49
S3

8263254

HENRY A. BAMMAN • MILDRED A. DAWSON • RAYMOND SULLIVAN



LOOKING at LIFE on EARTH



SCIENCE EDITOR

Raymond Sullivan

San Francisco State College

San Francisco, California



E8263254



PRODUCED BY CENTURY COMMUNICATIONS • SAN FRANCISCO
FOR CENTURY CONSULTANTS • CHICAGO

1969



CONTENTS

LOOKING AT LIFE

<i>Living Things</i>	6
<i>The Building Blocks of Life</i>	7
<i>Animals and Plants</i>	8
<i>A Family Tree</i>	10
<i>The World is Changing</i>	13
<i>The Book of Rocks</i>	17
<i>The Pictures in the Rock Book</i>	20

1. THE BARREN WORLD

<i>In the Beginning</i>	24
<i>The Lifeless World</i>	25
<i>Life Begins in the Water</i>	26
<i>The First True Plants and Animals</i>	27
<i>Life Changes</i>	30

2. THE TIME OF ANIMALS WITHOUT BACKBONES

<i>Life Is Rich in the Seas</i>	34
<i>Rulers of the Seas</i>	36
<i>Water Scorpions</i>	38
<i>The First Life on Land</i>	40
<i>The First Fish</i>	42
<i>Fish that Walked</i>	44
<i>Animals that Live on Land and in the Water</i>	46



Land at Last
The Earth Changes

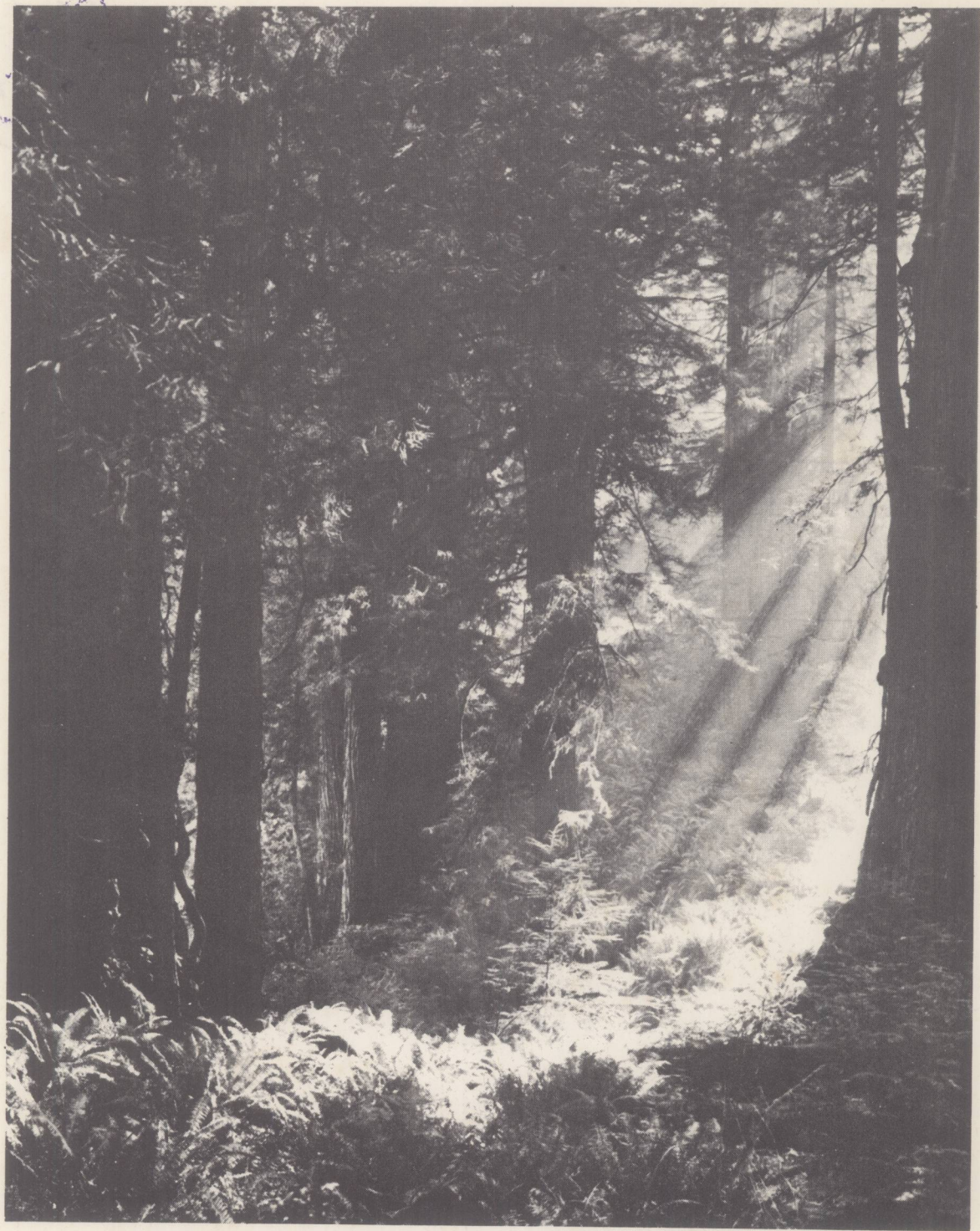
50

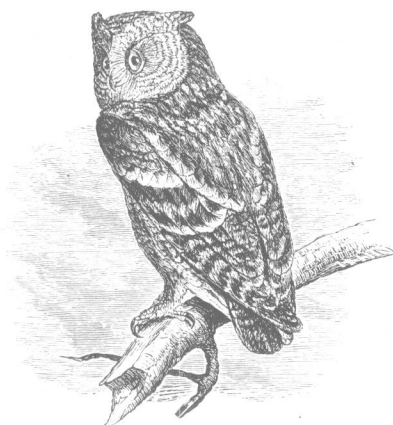
3. THE TIME OF THE DINOSAURS

<i>Many Kinds of Reptiles</i>	52
<i>Monsters of the Land</i>	52
<i>The Gentle Giants</i>	53
<i>The Savage Dinosaur</i>	55
<i>Dinosaurs with Horns</i>	56
<i>The Sea Monsters</i>	57
<i>Flying Dragons</i>	58
<i>The Death of Monsters and Dragons</i>	59
<i>The First Birds</i>	60

4. THE TIME OF THE MAMMALS

<i>Small but Mighty</i>	65
<i>The Giant Beasts</i>	67
<i>The Story of the Elephants</i>	70
<i>The Story of Horses</i>	72
<i>The Long, Cold Winter</i>	74
<i>The New Rulers of the World</i>	77
<i>The Rulers of the World Now</i>	81
<i>Acknowledgments</i>	84
<i>Glossary</i>	85
<i>Index</i>	86





LOOKING AHEAD—

Here are some of the main ideas that you will find explained in this chapter of your book. Thinking about these ideas should help you in learning how scientists have solved important problems by looking carefully at life on earth.


1. All living things, large or small, are made up of cells. Cells are “the building blocks of life.”
2. Living things may be divided into two kingdoms, the plant kingdom and the animal kingdom.
3. The world around us is changing.
4. Many plants and animals we see today are different from those that lived many years ago. The way in which they have changed is called “evolution.”
5. The changes that have taken place in the history of the earth are preserved in the rocks. Plants and animals that lived in the past are preserved sometimes as fossils in the rocks.
6. The “Book of Rocks” is made up of four chapters.

LOOKING AT LIFE

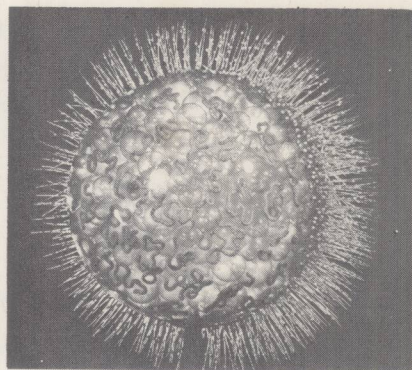
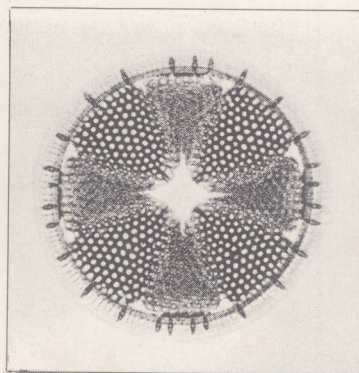
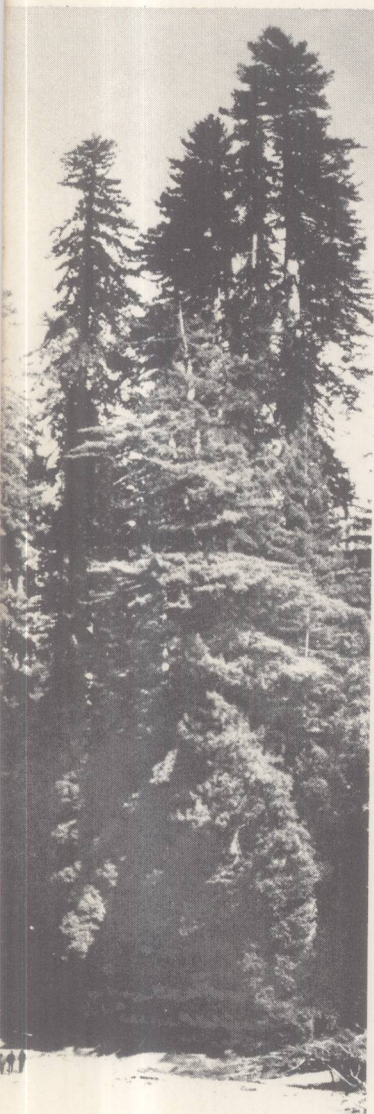
LIVING THINGS



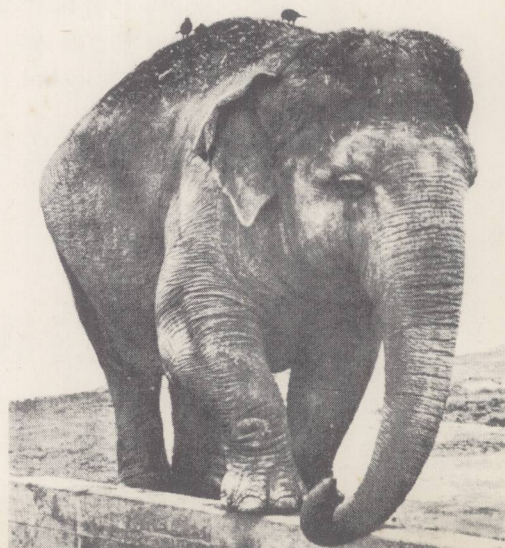
What is the largest living thing that you have ever seen? Was it an elephant? A whale? A giant redwood tree?

What is the smallest thing that you have ever seen? Was it a tiny fly? A worm? 

If it was big enough for you to see, it was not the smallest living thing. All around us are many living things that you cannot see with just your eyes. They are so small that you need a microscope to see them.



Tiny living things, many times enlarged, can be found in a drop of water. You need a microscope to see them.

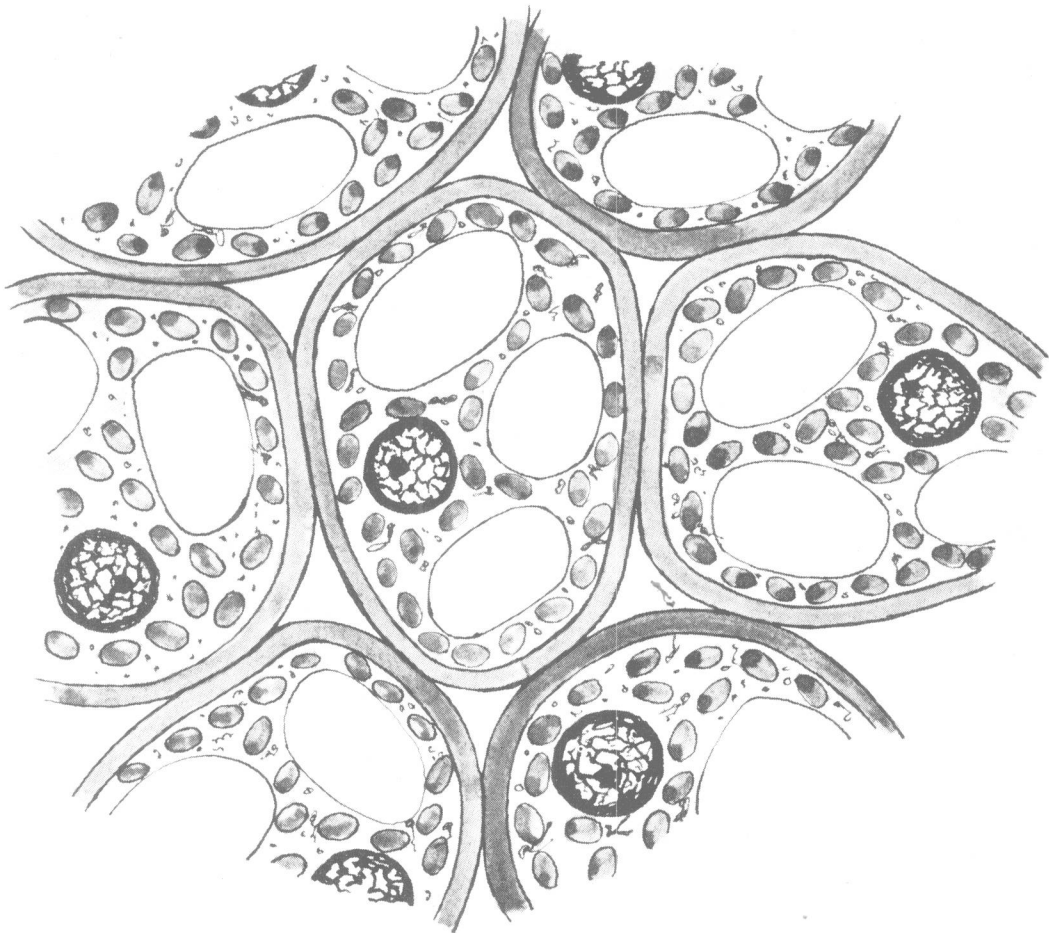


THE BUILDING BLOCKS OF LIFE

Whether it is large or small, everything that lives is made up of a small part or parts that we call **cells**. The tree, the flower, a worm, and your body are made up of millions and millions of tiny cells. We call them "the building blocks of life." When we put many, many cells together, they build a bigger living thing.

Cells of all living things are made up of something that looks like watery jelly or the white of an egg. This material is called **protoplasm**.

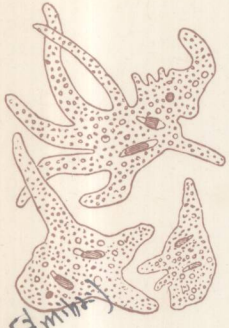
Everything that lives is made up of cells.



ANIMALS AND PLANTS

All living things are divided into great groups or **kingdoms**. There is an animal kingdom and a plant kingdom.

The common kinds of plants look so different from the common kinds of animals that it would seem easy for us to tell them apart. But sometimes it is not easy. A few of the simple plants and animals are very much alike. Even scientists sometimes find it very hard to know which is an animal and which is a plant.

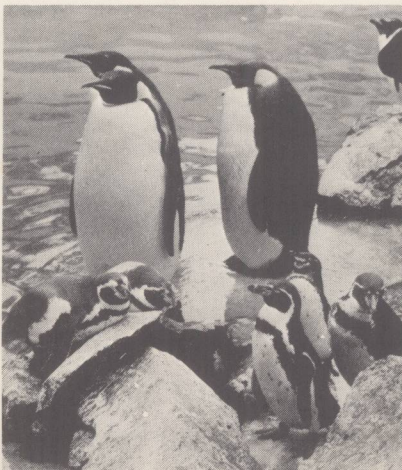


Amoeba, a simple animal

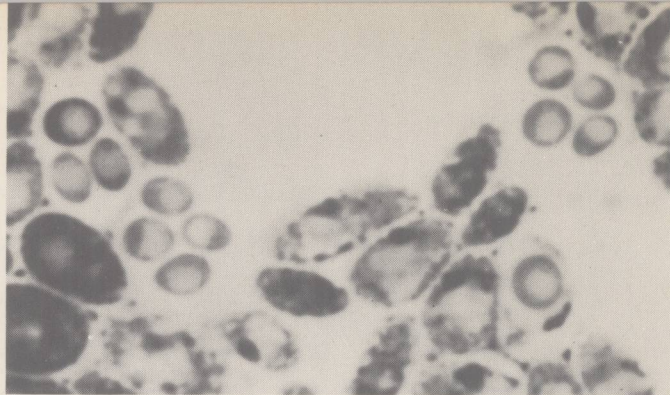
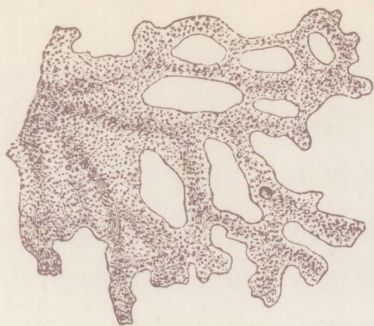
阿米巴
原生动物



These simple animals might be mistaken for plants.



Some common animals

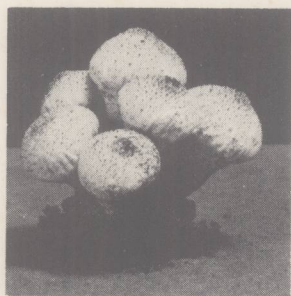


Some simple tiny plants that we can see only with a microscope

Most plants are different from most animals. Most plants can make their own food. To do this, they need sunshine, air, water, and materials from the soil. But no true animal can make its own food.

Most of the plants are fastened to one place by their roots. Most animals must move around to find their food.

There are many differences between plants and animals. Can you think of some differences?



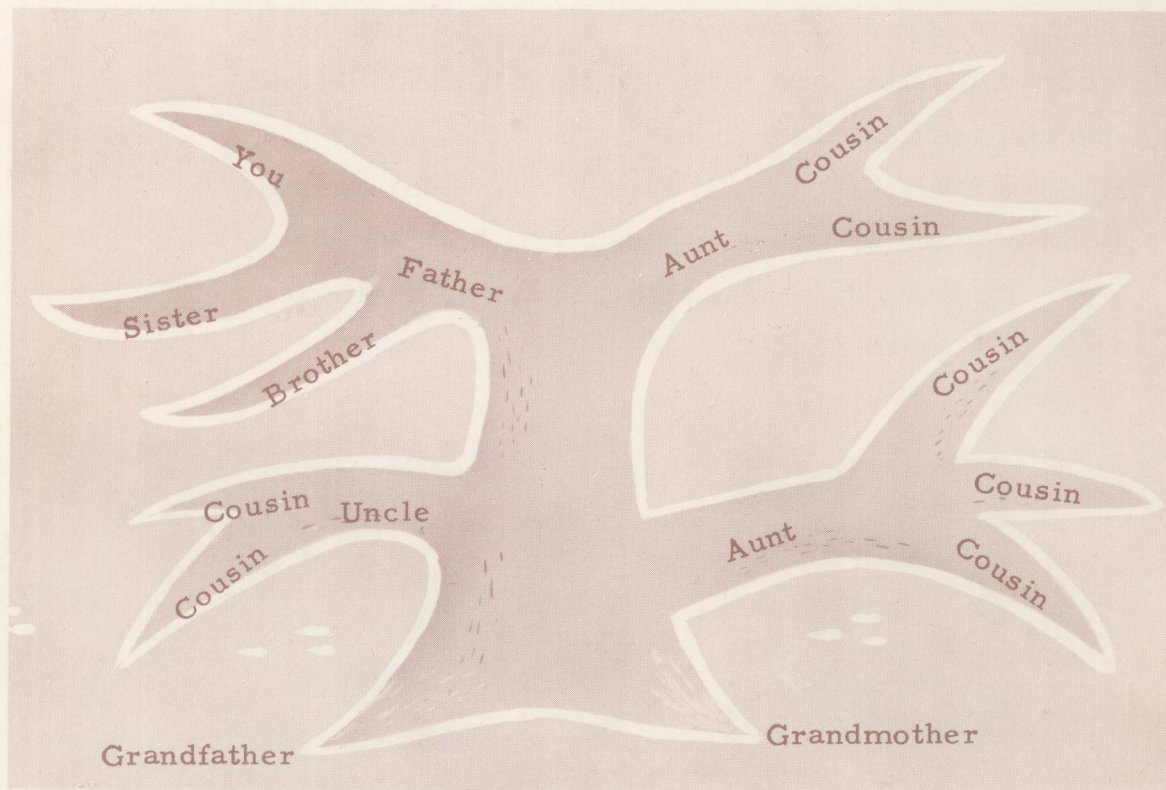
Some common plants



A bee, an insect that is often seen around flowering plants

A FAMILY TREE

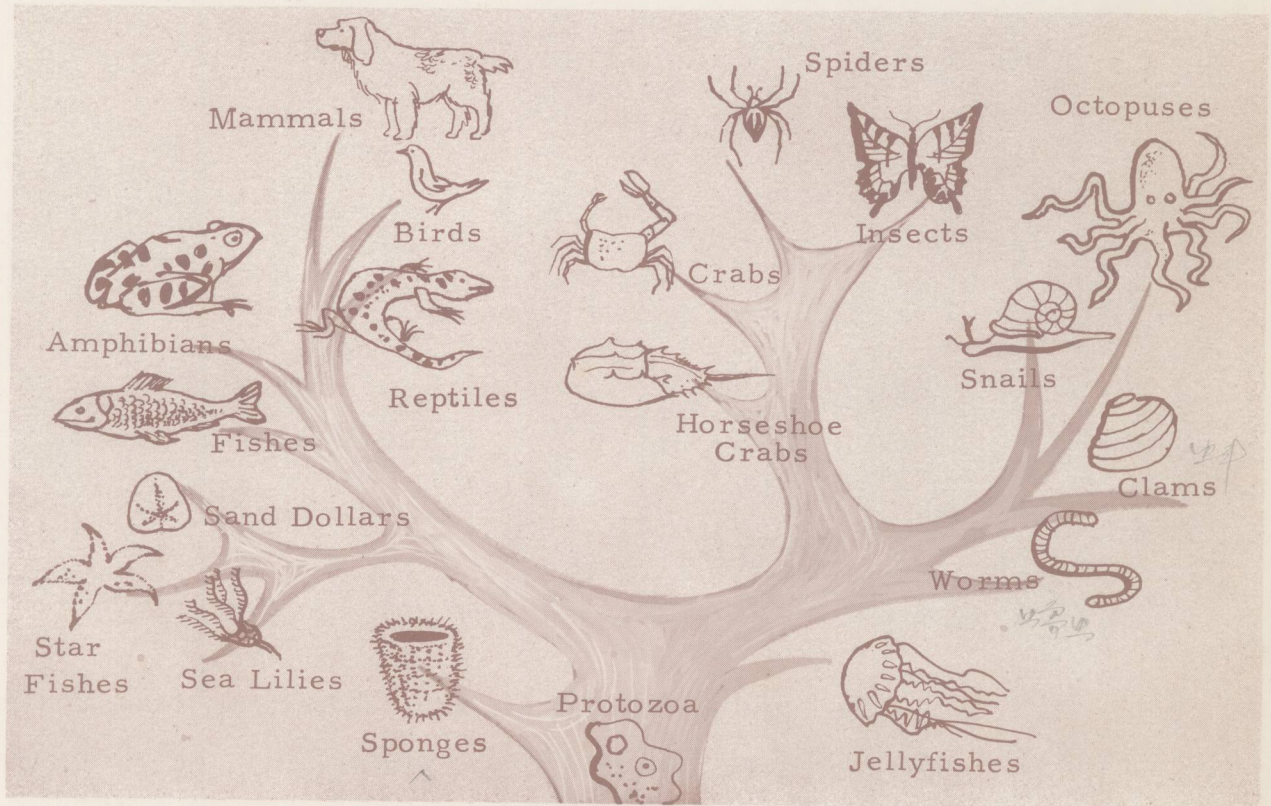
Here is a picture of your family, showing how you are related to your brothers, sisters, cousins, uncles, aunts, and your grandfather. Notice that the picture looks like a tree, with a trunk and branches. We call this your **family tree**.



A scientist may use the same sort of a tree to show how plants or animals are related to each other. If we tried to make a tree that showed all of the thousands of plants and animals in the world, we would have to use pages and pages of paper. So, let us look at one family that shows just a few of the main kinds of animals.

The tree starts with the simplest animals, which are made up of only one cell. They are the "grandfathers" of all the other groups of animals.

Above the trunk, the family tree of animals divides into many branches. In these branches, the animals have more than one cell. Most of them have hundreds, or thousands, or even millions of cells in their bodies.

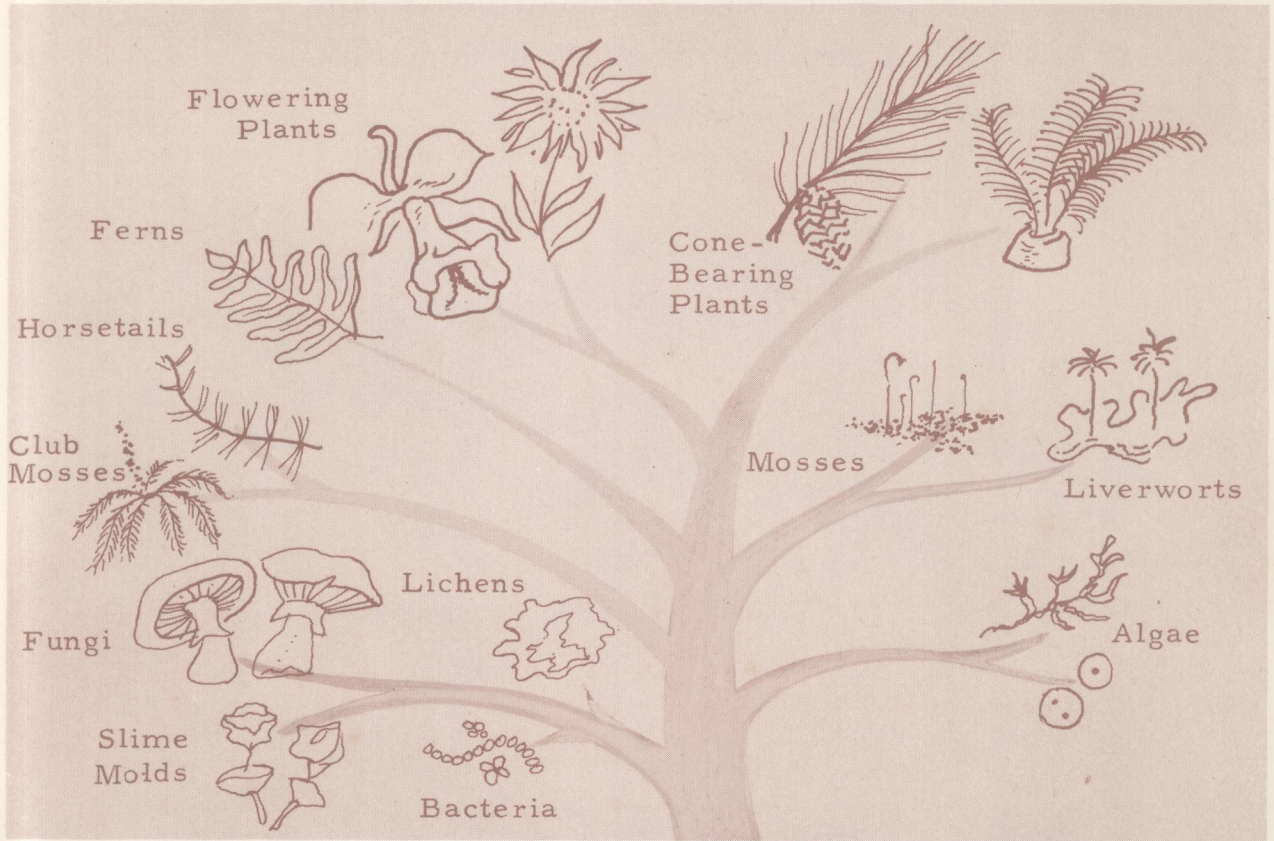


The branches of this tree show how animals are related to one another. Animals of one branch are more like each other than they are like animals of another branch.

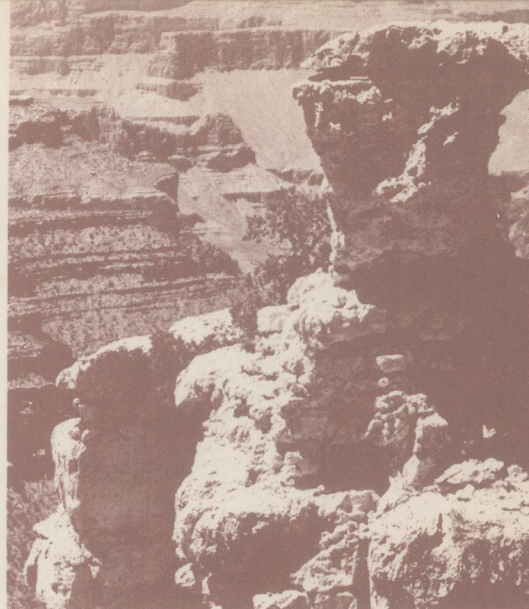
This tree of the animal kingdom shows how groups of animals are related. It shows, also, how our modern ani-

mals have developed from very simple animals to very complex animals.

Study the animal family tree carefully!



This plant tree has so many branches because there are so many different kinds of plants. The higher branches show the complex plants. The lower branches show the simple plants. Most of the plants on the lowest branches are made up of one cell. They are very much like the plants that were at the beginning of all plant life. Can you tell how a plant family tree and an animal family tree and a family tree of people are different? How are they alike?

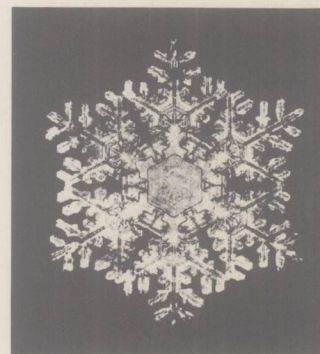


THE WORLD IS CHANGING

During each day, or month, or year, many things in nature are changing. Some of these things you can see for yourself.

Water changes into ice when it is very cold. The water in a teakettle changes into steam when it boils.

The earth itself is changing, too. The sands on the beach are moved by the waves of the sea. The rain washes away the soil in the fields. Rain and wind can wear down high mountains and turn them into low hills.



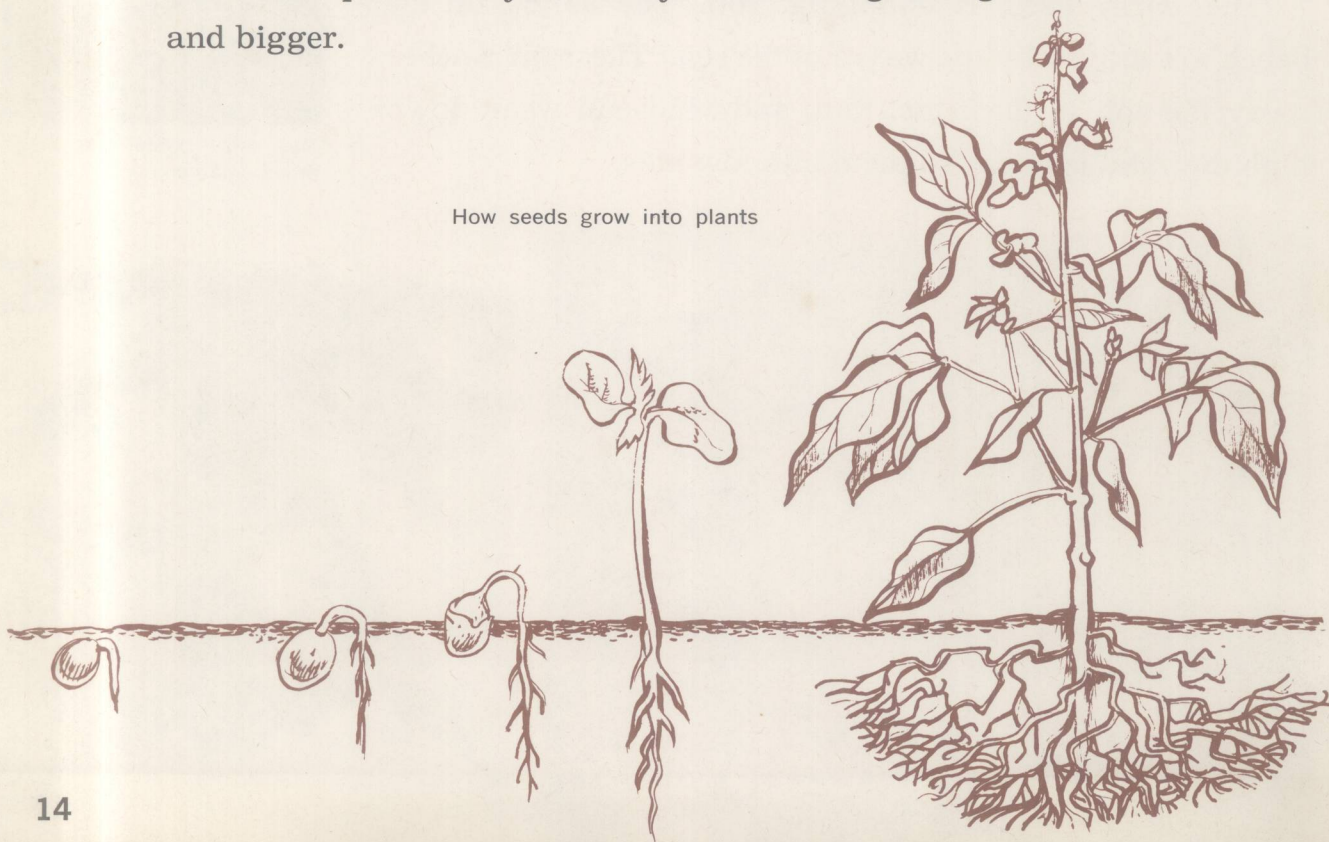
This snow crystal was many times enlarged.





Plants and animals change, too. Seeds that are planted in the ground grow into plants that give us vegetables to eat. Eggs hatch into baby chicks and then grow into chickens. Little tadpoles with tails and no legs turn into frogs without a tail and with legs. You can see the changes that take place in your body. You are growing older and bigger.

How seeds grow into plants





Plants that lived long ago

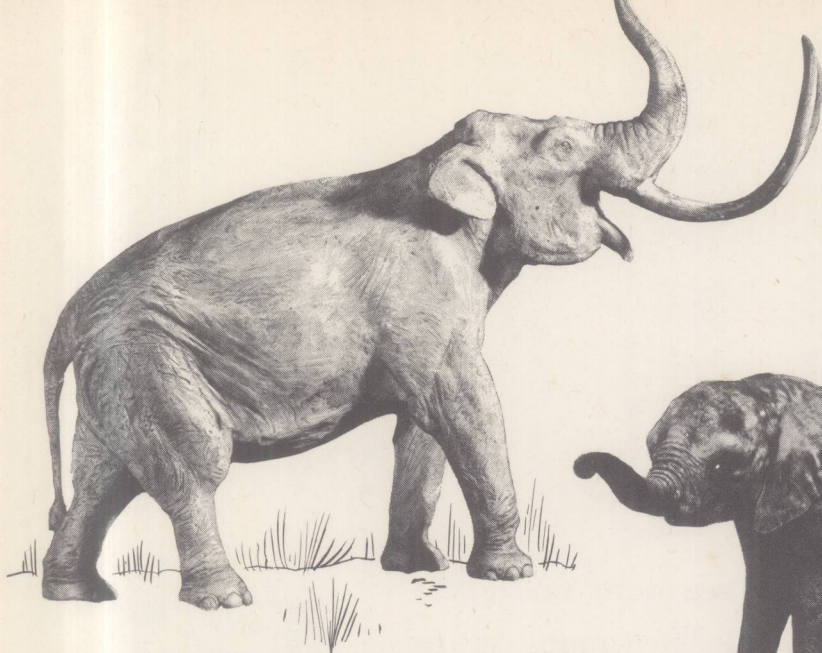
Many animals and plants that we see today are different from the animals and plants that lived many years ago. Some of the animals and plants have changed so much that it is hard to tell that they are like the things that lived long ago. Others have changed very little.

The slow change of animals and plants is called **evolution**. We say that simple animals **evolve**, or change, into more complex animals. Simple plants may evolve into more complex plants. The change may take thousands and thousands of years, but it is important that we know about it.



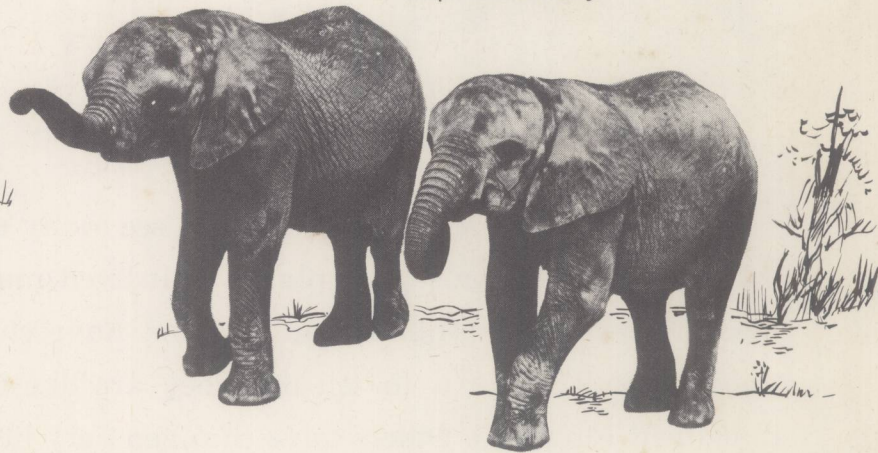
Trees of today



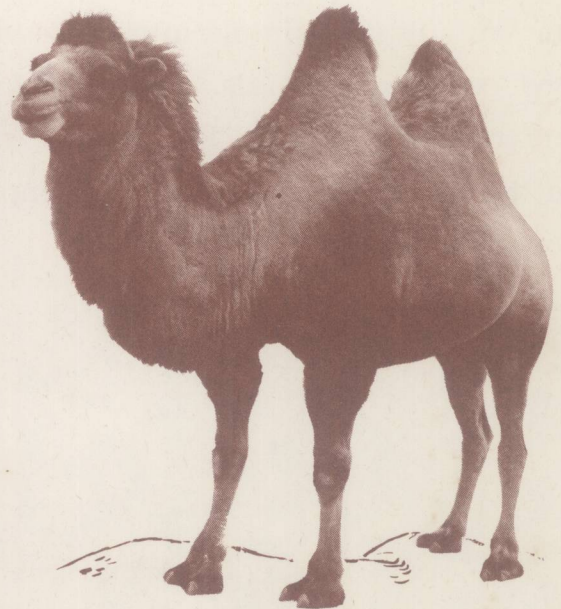
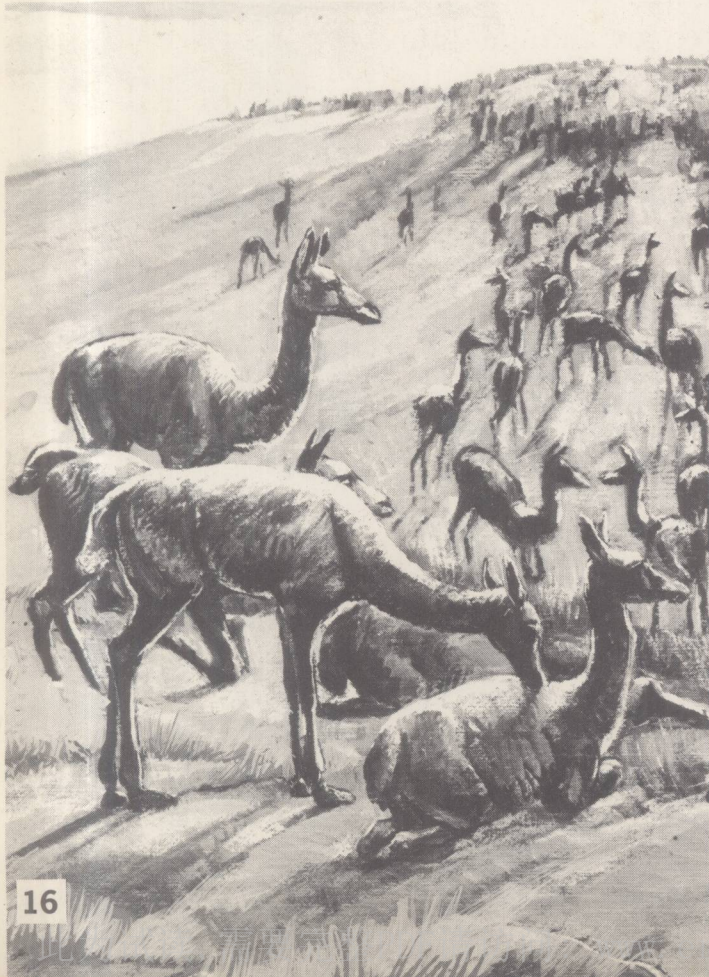


An elephant that lived in the past

Elephants of today



A relative of the camel that lived long ago



The camel of today