EASY LESSONS IN POPULAR SCIENCE: AND HAND-BOOK TO PICTORIAL CHART

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Easy Lessons in Popular Science: And Hand-Book to Pictorial Chart by James Monteith

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JAMES MONTEITH

EASY LESSONS IN POPULAR SCIENCE: AND HAND-BOOK TO PICTORIAL CHART

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EASY LESSONS IN POPULAR SCIENCE;

AND

HAND-BOOK TO PICTORIAL CHART:

COMBINING THE

CONVERSATIONAL,
CATECHETICAL,
BLACKBOARD AND
OBJECT PLANS,

WITH MAPS, ILLUSTRATIONS, AND LESSONS IN DRAWING, SPELLING, AND COMPOSITION.

BY JAMES MONTEITH,
Author of School Geographies, etc.

NEW YORK ·:· CINCINNATI ·:· CHICAGO
AMERICAN BOOK COMPANY
FROM THE PRESS OF
A. S. BARNES & CO.

CHARACTERISTICS OF THIS BOOK.

It contains PRIMARY SCIENCES FOR TWO GRADES; the lower (comprising very young children) to be restricted to the paragraphs in large type.

Method.—BY ILLUSTRATION, COMPARISON and FAMILIAR CONVERSATIONS. OBJECTS are illustrated on a large PICTORIAL CHART for wall of Class-room; and on BLACKBOARD, according to given directions for drawing.

Topics.—SHORT and VARIED—those suggested on an excursion in the country by a teacher and her class; such as Air, Water, Rocks, Land,—what they contain and what are their uses; with interesting lessons on Rain, Rivers, Plants, Trees, Agriculture, Mining, Manufacture, Fishes, Birds, Animals, Insects, Geography, etc.

Exercises, also SHORT and VARIED, include:

READING;

DRAWING on BLACKBOARD and SLATES;

ORAL EXERCISES, with Questions and Answers,

WRITTEN REVIEWS, combining Spelling and Composition.

Exercises on the PICTORIAL CHART and WALL MAP OF THE WORLD.

Although adapted to the PICTORIAL CHART, the book is complete in itself and may be used independently as a TEXT-BOOK for Primary Classes or for ORAL INSTRUCTION by the teacher.

It contains numerous Wood Engravings and Colored Maps.

Its object is not only to INSTRUCT, but to EDUCATE,—to draw out and strengthen the reasoning faculties, and to encourage habits of observing, thinking, analyzing and comparing.

UNIV. OF CALIFORNIA

EASY LESSONS

IN

POPULAR SCIENCE.

CHAPTER I.

DIRECTIONS.

To conduct the lessons, Monteith's Pictorial Chart and a large map of the world should be hung on the wall in full view of the class. A globe, also, should be shown. The teacher will then read aloud from the Handbook, pausing for answers which the pupils may be able to give to the questions.

The names in black-faced type, as **ocean, surface, clouds,** etc., should be pointed out on the chart or map when they are mentioned. This may be done either by the teacher or by the pupils in turn.

The illustrations should be drawn on the blackboard by the teacher, and by the children also, on their slates.

(In classes composed of very young children, the spelling and other exercises in small type may, at the discretion of the teacher, be omitted in the first course. The words in the spelling exercises should be written on slates by the pupils.)

1. If you should take a long walk from the city, town, or village in which you live, you might see people, houses, streets, roads, fields, trees, streams, ponds, mills, factories, horses, cows, sheep, and other animals; perhaps you would see a part of the ocean, on which great ships and steamers sail.

2. The **ocean** and **fields** are parts of the earth's **surface.** People, animals, trees, houses, ships, etc., are *on* the surface. When you see flies on an orange, you may say they are on its surface or outside part, just as people and animals are on the **surface** of the earth, which is round like an orange.

3. When you look upwards and around you, you may see the sky, the sun, and, perhaps, clouds; at night, you may see the moon and stars, and other bodies called planets, which look like stars.

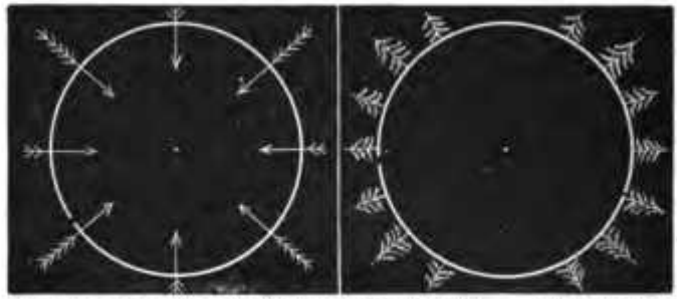
4. All this time you are breathing—what? *Air.* Without air you could not live, nor could any animal, bird, or fish, or tree live. Sometimes the air is still, sometimes it moves gently and you are able to fly your kite; then, again, it rushes powerfully and fearfully, blowing down trees, fences, and houses, and sinking ships.

SPELL AND DEFINE—**City, town, ship, village, trees, bird, stream, fish, surface, kite, mill, factory.**

5. This we call wind. You feel the air, you breathe it, you see the effects of the wind, yet you have never seen air or wind. You admit that there is air and that there is wind, although both are invisible. What does invisible mean? Are houses and trees visible or invisible?

6. Now, as the earth is round (or very nearly so) like a great ball, and people travel or sail around on every part of it, what is it that keeps them from falling off from this great ball called the earth? It is something that is both useful and powerful. It is also invisible. When you throw your ball high in the air, it is brought back again by something which you cannot see, by this other invisible power; without this power your ball would never come back to you. When chestnuts are ripe, and when you throw a stone into an apple-tree in the autumn, the chestnuts and apples are brought to the ground by this same invisible power. Do you know what we call it? *Attraction.* Without this attraction which the earth has, those chestnuts and apples would be as likely to fly away toward the moon or the sun or some of the stars. Without this power which the earth has of drawing or attracting to itself (always downward), the farmer could not sow his seed, for it would be as likely to fly toward the clouds as to fall on the ground; the carpenter

and the mason would not be able to keep their boards and bricks just where they wanted them; the chairs, tables, and beds in your houses would be as likely to rest against the ceiling as on the floor; and your sleds would no longer rush down hill on the smooth snow in winter.



Blackboard drawing to illustrate Up and Down. The teacher may draw by means of a piece of cord twelve inches in length a circle to represent the Earth. On it mark arrows as shown in model, all pointing to the center, and, consequently, Downward; then mark other arrows pointing from the center, or Upward.

Another circle may be similarly drawn, and on it trees be represented all pointing Upward. The directions to and from the center, or down and up, should be clearly explained to the class.

7. In what direction does the earth draw or attract objects? *Downward, or toward its center.* In what direction is up? *From the center of the earth, or over your head.* Point upward; downward.

8. Now, a knowledge of all these things, as well as of different countries, mountains, and places on the earth, and of the wonderful fitness

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SPELL AND DEFINE—**Air, wind, apple, earth, farmer, up, down, sled, snow, board, bricks.**

of them for people's enjoyment and welfare, may be obtained by studying geography.

9. When we look at the sun, moon, and stars, we see they are round; and if there are people living on the moon now, they would look at this world or earth and see that it too is round.

Blackboard drawing to show Rotundity of the Earth. With chalk and a cord two feet long describe an arc as here shown. On the left draw a part of the coast of North America, with a lighthouse on Newfoundland; on the right, England, Ireland, and the coasts of Europe and Africa. From the top of the lighthouse draw a straight line touching the Arc or Surface of the Earth; then show ships on the Atlantic in different positions, one below the horizon, another partly above, and another wholly above it. The straight line is the Line of Vision to a man in the lighthouse, and the point where that line touches the arc or surface shows the extent of his Horizon. The lighthouse and masts all point from the center of the earth.

10. How have men proved the earth to be spherical, or round like a ball? *Men have sailed around it as flies travel around an orange; then, again, the hull, or body of a distant ship coming toward you is not seen as soon as its topmast.*

Which is the larger body, the sun or moon? *The sun.* Why does the sun not look much larger than the moon? *Because it is a great deal further from us than the moon is.*

SPELL AND DEFINE—**Orange, round, spherical, hull, top-mast, center, geography, lighthouse.**