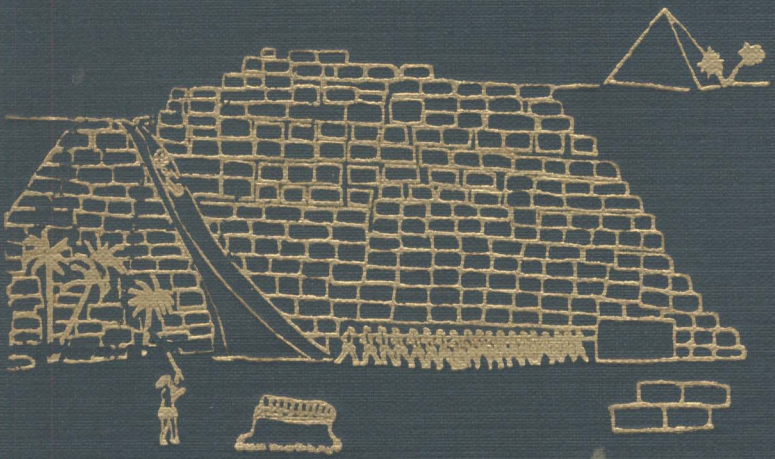
MILLIONS OF YEARS IN A WINTER



EDNA BRIDGE LEINING

UNIT OF WORK

MILLIONS OF YEARS IN A WINTER

by

EDNA BRIDGE LEINING

TEACHER OF FOURTH GRADE

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MILLIONS OF YEARS IN A WINTER
Edna Bridge Leining

Editor's Introduction

For the past quarter century the emphasis in learning studies has been upon growth in isolated fragments of a total experience. This practice is in harmony with the traditional philosophy of education and the atomistic psychology of learning. The more recent experimental philosophy and the organismic psychology give rise to the need of studies of the nature of growth in the total experience followed by such analysis as seems to shed light on the interpretations of such growth. Through the teacher's Diary Record this book, *Millions of Years in a Winter*, gives an account of the development of the whole experience, showing the dynamic interests, the changing directions, the emergence and refinement of objectives, the use of informations and techniques, the guidance of the teacher, the development of standards of evaluation, and the evolution of new meanings. Through the various types of measurement employed, the learning of parts is differentiated from the whole not so much in isolation, as in their relationships to each other.

Emphasis upon growth in dynamic wholes rather than isolated parts of experience offers a virgin field for the study of learning, with possibilities of unlimited rewards both in describing and in explaining human behavior. To those individuals interested in this viewpoint, *Millions of Years in a Winter* should be very stimulating. To those who approach learning from the opposite point of view, this book should be highly challenging.

L. Thomas Hopkins

Preface

THE record presented here of a fourth grade's venture into the realm of science had its origin in the informal diary account kept by the classroom teacher for her own use without thought of publication. At the suggestion of the Research Department of Lincoln School, a unit involving such an experience in science was again explored to secure the evidence which furnishes the basis of this account. The book is divided into two parts: Part I is a description of the setting in which a unit was worked out in a fourth grade class interested in the "beginning of things." This section includes a diary account of the year's work in science and a discussion of other educative experiences accompanying it. Part II contains some evidence of the growth in science learnings attained by the pupils through such a study.

The author wishes to express her appreciation to all those members of the Lincoln School staff who shared in the experience of the unit and who assisted in the testing program. The operation of that program involved the use of control groups both in Lincoln School and in coöperating institutions, the courtesy of whose supervisors and teachers is gratefully acknowledged.

It was the generous coöperation of the Administration of Lincoln School which made possible the conduct of this study and its subsequent publication. Appreciation is expressed to Dr. Jesse H. Newlon, Professors L. Thomas Hopkins and Paul R. Hanna, and Miss Rebecca J. Coffin for their interest and guidance, and to Mrs. Frances Foster for her aid in preparing the manuscript for the press.

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THE SITUATION

Setting of the Study

Lincoln school of Teachers College is situated in New York City overlooking Morningside Park. At once the environment of the school is conditioned. One cannot fail to be aware of the massive pile of rock immediately overhanging the sidewalk. In winter, that section is roped off with "danger" signs prominently displayed. "Why is it dangerous to walk on that side of the street?"

Wandering through the park the concrete walk is interrupted by natural rock, much worn and grooved. Scientists believe the glacier made some of those scratches about thirty thousand years ago. "What is a glacier?" "Where did it come from?"

A tree is growing through a rock. A loose piece of mica schist is picked up. The mica glistens. It flakes off. You can see through it. Water is trickling over gouged surfaces of rock. A huge block of stone is poised ready to fall. Perhaps it will make a miniature avalanche. Not all the park is rocky. It drops suddenly to a low flat plain, yet we are told it was once all the same height. "Why?" "Where did the rest of the land go to?"

You look north on Amsterdam Avenue. It slopes down into a valley rising steeply on the farther side. It is believed that there was once a river flowing through the de-

pression which is now One Hundred Twenty-fifth Street. "Where is that river now?"

The Palisades form a wall of rock made by an igneous intrusion or perhaps a "volcano that didn't erupt." "Why didn't it erupt?" "Why haven't we a volcano for the Palisades?"

You see the Hudson River that really isn't a river but an estuary—an arm of the sea that has come in and drowned the valley. The glacier filled in the gorge of the old river. That is why the new George Washington Bridge had to be built with the longest span in the world.

Such is the physical setting of Lincoln School in a rich geological and physiographical environment. In addition, there are museums close at hand. The American Museum of Natural History has a wealth of material to supplement a study of the earth materials and forms. In the Metropolitan Museum of Art, the uses of stone in artistic expression are shown. The library facilities of the city are of the best.

Not only is the neighborhood environment rich in suggestion, but the school itself affords unusual opportunities. It is experimental in character, and so allows freedom to develop the idea that is "different." The curriculum of the elementary school has not been definitely formulated. It is adapted to each particular group of children, following their interests, needs, and abilities. Experiences are integrated through their organization around a unifying interest. Trips are made possible and encouraged by a school bus service. Frequently, parents generously lend their own cars for such excursions.

The school is equipped with a well-chosen library, an

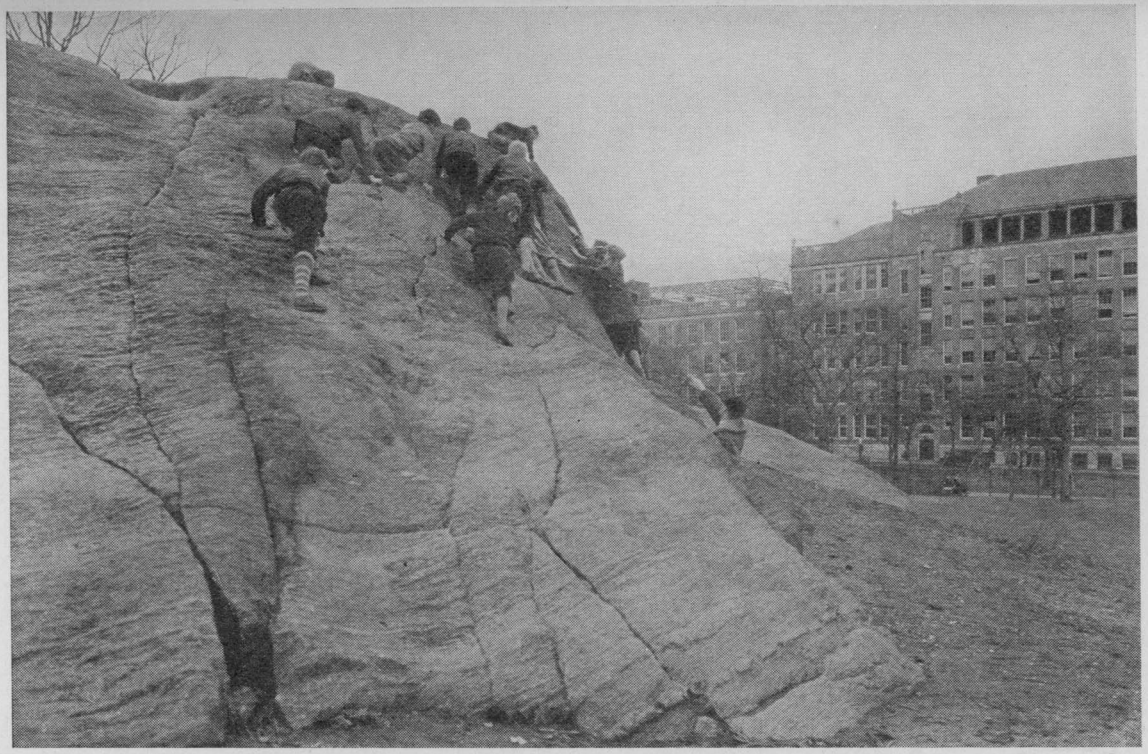

FIG. 1. CLIMBING OVER A ROCK IN NOON RECREATION PERIOD

industrial arts shop, a science room, art rooms, cooking laboratory, sewing room, gymnasiums, swimming pool, roof playgrounds, and an auditorium with facilities for showing motion pictures and slides.

The appearance of the classrooms with their blackboards and bulletin boards is not unusual. The desks are movable. Easels, paints, work benches, and tools are part of the equipment for room activities.

The classes are not large. They average about twenty to twenty-five pupils, usually about evenly divided between boys and girls.

The pupils of the school are of superior mental ability. About ninety per cent of them have a mental age beyond the average of public school children of the corresponding chronological age in the country at large. A few are gifted children, although many are of average ability. While some of them have unusual home backgrounds, there are scholarships which make possible a very democratic social atmosphere in the school. However, there is probably a tendency for only liberal-minded parents to send their children to a school that does not follow a traditional program.

Origin of Unit

In the elementary department, it is customary to encourage the children to engage in some worthwhile activity or hobby during the summer. Much attention is given in the early part of the school year to reports of such experiences; assemblies are held and exhibits are arranged showing the objects that have been collected during the summer vacation and brought in. There is certain to be a rock collection or two among the treasures which fourth-grade pupils bring in. One year, Robert brought in pieces of

water-worn driftwood, stones and pebbles mounted on cardboard bearing the heading, "The Work of the Waves." Alfred had found some obsidian or volcanic glass. The discussion that followed the display of these collections encouraged others to bring in rocks and minerals. There seemed to be much interest in knowing something about all the specimens. However, there was a continuous undercurrent of interest in rocks.

During the first part of the semester, the children engaged in a food study in connection with the use of the cafeteria and also in a study of bees. When the time came to decide upon a new unit of work, they clamored for a study of rocks and minerals. The teacher was not at all certain that it would prove a sufficiently rich field for a main interest at this grade level. However, she was willing to be convinced. The children were asked what they wished to know about the subject. Immediately, enough questions were asked to fill several blackboards. When the queries were organized, it was found that they covered many different subject-matter fields, science, geography, and industrial arts predominating. As few books on rocks and minerals and their uses written for children were then available, the teacher spoke of the difficulty of securing sufficient information for such a study. The children replied that not everything had to be learned from books. The teacher finally agreed that they might have the study if they could show that it would be worth while and that enough study materials and sources of information could be found.

The next day the children started bringing in more specimens of rocks and making suggestions for supplementary sources of information. The father of one of the children had a friend who owned a coal yard. The child suggested

that it might be visited by the group. That child also promised to obtain an exhibit of the different varieties of coal. Another child promised to bring in samples of rocks and minerals used for building materials. Plans were made to write letters to commercial firms for exhibits of the processes and products of minerals such as asbestos, iron, graphite, oil, etc. There were suitable books and pictures in the homes of some of the children which could be brought to school for the use of the class. Almost at once it was found necessary to learn to use the card catalogue and children's encyclopedias in the library. A bibliography, correctly made on library cards, was started by the children in order to show the sources of information thus discovered.

There was soon no question as to whether we should engage in such a study for we were already deeply plunged into it.

The unit on "Rocks and Minerals" proved to be a fascinating one to the children and had a richness that showed the title to be quite inadequate.

During the conduct of the first unit, such possibilities were revealed that it was decided by the teacher to explore that field still further when child interest seemed to warrant it. The study appeared to offer unusual opportunities for developing concepts and large generalizations in science. The group that followed demonstrated no readiness for such a study so the further exploration of the field was delayed until the third year.

Unquestionably, the first unit on science came into existence as a direct outgrowth of the children's interests. It was definitely initiated by them. The second time it was taught, it presented another problem. In consultation with