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LINCOLN SCHOOL CURRICULUM STUDIES

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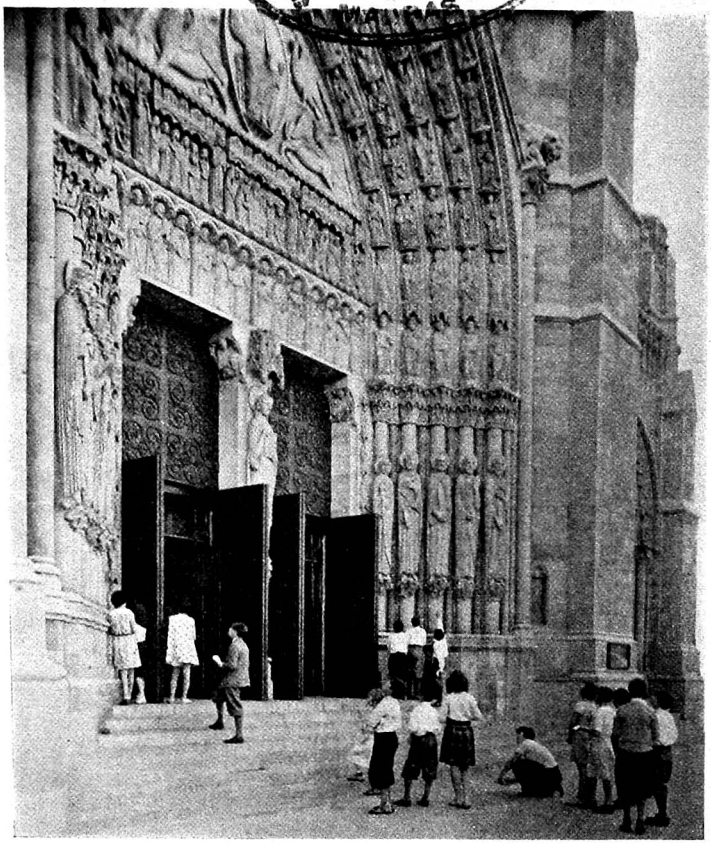

THE CHILDREN OF THE SIXTH GRADE MAKE A DIRECT CONTACT WITH ARCHITECTURE. THEY VISIT THE RIVERSIDE CHURCH TO OBSERVE THE DETAILS ON THE DOORWAY OF A MODERN GOTHIC CATHEDRAL

UNIT OF WORK

CHILDREN AND ARCHITECTURE

by

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TEACHER OF SIXTH GRADE

and

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ASSISTANT IN RESEARCH

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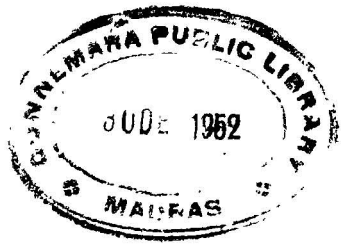


Dedication

TO THE BOYS AND GIRLS
WHOSE KEEN INTEREST IN THE STORY OF WORLD
ARCHITECTURE WAS THE INSPIRATION FOR THE
DEVELOPMENT OF THIS UNIT OF WORK

DURING the first six thousand years of the world, from the immemorial pagoda of Hindustan to the cathedral of Cologne, architecture was the great handwriting of the human race. Not only every religious symbol, but every human thought, had its page and its monument in that immense book. The human race had no important idea which it has not written in stone. Humanity has two books, two testaments: masonry and printing—the Bible of Stone and the Bible of Paper.

VICTOR HUGO

Foreword

To the Readers of This Book:

We of this family can only judge the results of the architectural unit in the Lincoln School by the astonishing effect on a little girl of eleven, daughter to one of us and niece to the other two. We shall have to admit that, by accident, her mind was seeded for this course. She had spent one whole year in France and three winters besides. Whether or not she has a natural *flair* for the architectural impression, we do not know. She is, however, very facile with her pencil and we noted that all houses, streets, and parks in the scenes she drew, after her return from Europe, were French.

The first effect of the architectural course was a sudden interest and an amazing information on her part in prehistoric man. We began eagerly to pool our knowledge. Two of us have always been fascinated by Stonehenge and, during a stay of several months last summer in England, visited it for a second time. We English sojourners presented picture postcards of the prehistoric remains at Stonehenge. French sojourners presented picture postcards of simpler prehistoric remains in Pornic. Marvel! They seemed perfectly to dove-tail. Much talk about possible reasons for this resemblance. The English travelers further produced pictures of Kit's Coty House, the Countless Stones of Maidstone, the Tall

Man of Wilmington, and some of the White Horses of the Hills. For a time, we all went prehistoric.

Next, Egypt became the point of interest. The child consulted encyclopedias, travel books: she visited the Metropolitan Museum of Art: she produced a report on Egyptian architecture which vastly increased the information of at least two of the undersigned. In some mysterious way, geography and history came into this research. The talk at the table was all of Egypt. In the architectural orgy, which lasted for the term of the school year, Egypt was the first love of the little girl; it remains so to this moment.

After Egypt came Greece. Again the child, tapping some new and—to us—unguessed power, produced a report on Greece—its geography, history, architecture. One of us who admits to just scraping through his college Greek is nevertheless a passionate Greek enthusiast. Here he swung in; tore through that section of the encyclopedia which dealt with Greece; re-read chapters of various favorite histories. The table-talk switched from Egypt to Greece.

Then came Roman architecture! Again a report which staggered us grown-ups. One of us is a Rome addict. She searched her soul for memories and associations—going back even to the Rollo books, which were her first source of information on her beloved city.

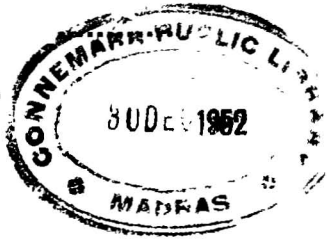
And so it went—Medieval, Romanesque, Gothic, Modern, and Modernistic. Always from the child a detailed report, entirely self-evolved, which seemed to us fairly remarkable, although we knew it was no better—and we hoped no worse—than those which the other members

of the class were producing. Always reminiscences of architectural masterpieces of various types and kinds and countries. Always much furtive recourse on the part of the grown-ups to the encyclopedia, to books of history and travel. Always long talks. Lintels . . . arches . . . Rheims Cathedral . . . the Chrysler Building. . . .

To take a walk in the city of New York with the little girl during this period was a revelation. Although intensely interested in architecture, none of us was really architecturally minded. *She* was; she had become so. She noted architectural details just as frequently and unconsciously as a woodsman notices the "sign" in forest trails. None of us had ever before realized how peppered it was by the egg-and-dart motive. But the child uncovered this architectural richness.

Perhaps we have said enough. To sum it up, however, the work of the architectural unit gave the child a strong grounding in architecture. It taught her to recognize in a flash of the eye the various architectural schools and the details which they employed. Quite painlessly, it trained her in the geography, the history, and the literature of the countries which produced these masterpieces. Last of all, it gave the undersigned a parallel course for which we are all extremely grateful.

Edith Haynes Thompson
Inez Haynes Irwin
Will Irwin



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THE authors wish to acknowledge their indebtedness to Lincoln School for the many opportunities given them for developing this unit of work. Acknowledgment is given also to all the other members of the staff of Lincoln School who in any way contributed help and inspiration for the unit, but especially to Miss Anne T. Eaton, Librarian, for her splendid coöperation in supplying the books which were the basis for the intellectual background of the unit; to Miss Helen Joyner who untiringly gave her help in developing the art work; and to Miss Elizabeth Jacobson who so understandingly cooperated with the children and the classroom teacher in developing the costume work needed in carrying forward the play.

To the parents of the children in the classes in which the unit of work was conducted, the authors are personally indebted because of the keen interest which they took in the children's work. In particular the authors wish to express appreciation for the many valuable books and illustrative materials given and lent by many of the parents, especially those secured through the interest of Mr. and Mrs. E. Weyhe.

Grateful acknowledgment is made also for the splendid coöperation of the Metropolitan Museum of Art while this study was being developed.

Preface

THE unit of work described in this volume recounts the experiences and activities of a group of sixth grade children whose interests were directed over an extended period of time by a study of the history and development of world architecture. Through this medium the children were exposed to a cross-sectional view of world civilizations from prehistoric times to our present generation. They found that man has expressed the spirit of his age through many agencies, not the least of which are the buildings which he has erected. They also found that these buildings, in many cases, reveal not only man's environmental influences but also his efforts to express his emotional reactions to his universe.

The study of world architecture in the sixth grade may possibly be considered a controversial issue. The reader should bear in mind, however, that the authors are not advocating the universal acceptance of this unit for the elementary school, nor are they in favor of having their suggestions followed meticulously or in their entirety in other school systems or curriculum studies. The account of this unit is presented primarily to show how an extensive and comprehensive theme fraught with human interest was planned, enriched, and carried out by sixth grade children in a particular environment. The unit of work is especially appropriate for children living in a

metropolitan area; it may not be found to be so completely applicable to the curricula of schools in sections where the environment may not stimulate so great an interest in architecture.

In writing an account of this unit of work the authors have not tried to prove any thesis nor to demonstrate by conclusive evidence that the best method for teaching children is by means of units of work. They are convinced of the efficacy of this means of instruction, but they can not produce scientific data to substantiate their conclusions. The changed reactions of children, the growth in study habits, the joy and satisfaction in work, the increased power to think—these are the kinds of evidence which the authors advance to justify their strong convictions, knowing, however, that they are not and can not be reduced to specific scores, quotients, or scales. In spite of the lack of scientific confirmation, the authors are none the less confident that an activity program presented through large units of work can be one of the most satisfactory means of providing a genuine situation in which learning is effectively accomplished. Since this book is not intended to be used as a textbook or as prescribed method of teaching, the authors feel that their purpose shall have been fulfilled if the readers find in it a few suggestions of inspirational nature to guide or to help them in planning a more unified and integrated program of study for active and inquiring boys and girls.

It may be of interest to the reader to know the manner in which the text and the illustrations for this book were developed.

The end papers and the headpieces and tailpieces used throughout the book have been taken from stencil and linoleum block designs made by the children.

A classroom teacher and a writer (who also had teaching experience) coöperated in the making of it. The initial impetus was provided by the Director of the school who urged the teacher to share with other teachers through such a published record the results of her experience.

All the plans and activities described in this volume were devised and carried out by the classroom teacher and the children. The teacher also kept notes of vital problems and issues which she thought might give additional meaning to the description of the unit; but she was left free to develop the study and to enrich it to the fullest degree without feeling the pressure or need to neglect any of her classroom duties in order to prepare a manuscript of her unit of work for publication.

Her associate, the writer, spent periods daily in the classroom observing the procedures, the reactions, and the activities developed in connection with the study, and keeping detailed records of them. These records were later classified and organized.

At frequent intervals the writer and teacher conferred, discussing the written presentation of the unit. There was, however, no feeling of interference or restriction between them in their separate fields of responsibility.

Naturally, these circumstances may have influenced to a degree the published presentation of the unit; but insofar as it is humanly possible to do so, this account is an exact and actual report and picture of the activities,

analyses, and progress of a unit of work as carried out over an extended period of time.

We hope that this book will help many readers in a practical way and that it will serve to stimulate teachers to initiate similar programs of work which grow out of an interest in the immediate environment.

E. A. B.
B. M. Y.

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CHILDREN AND ARCHITECTURE

Chapter I

THE TEACHER OUTLINES AND EVALUATES THE UNIT

A PROMINENT educator once stated that one of the prime aims of education is to make the obvious meaningful. If we are to take this statement seriously, we must revamp considerably our ideas of the curricula of our present school systems. Translated freely, this educator suggests that we need not go seeking through fields afar nor yet reach out falteringly for educative materials. We find in our immediate environment a wealth of material easily accessible, freely distributed, and genuinely real. Some of these materials have been over-used by zealous teachers; some have been proven inadequate by an artificial and acquired technique of handling; but, for the most part many of them have been grossly neglected because we, as educators, fail to comprehend the fullness of meaning back of them.

All the year round in all parts of the world children see, enjoy, and occupy buildings of one kind or another. The

average child is seldom far away from his home, his school, or some familiar building. And yet, how many of these same children know anything about these landmarks—know that they represent more than the expenditure of money and the utilization of materials? How many of our growing boys and girls have been made aware of the beauties of *this* structure or the atrocities of *that* one? Conscious exploration of the field should result in the development of standards for judging æsthetic qualities and for fuller appreciation of the beautiful.

The story of beautiful buildings is a fascinating one. It has in it all the joy and the thrill of romance, all the mystery of adventure, all the appeal of history and conquest.

The object in this unit has not been to develop the technical or constructive phase of architecture, for that is a specialized field of extensive study. Rather, the object has been to present the æsthetic and human side of this art, to trace its development through the ages, and to interpret its meanings in everyday life. The study is not an end in itself, but it is a means to an end of understanding more fully the historical development of nations. As such it serves as a medium for analyzing and understanding some of the outstanding achievements of mankind and for reflecting the conscious efforts of a race to adapt itself to things at hand. Architecture in its fullest sense is the expression of civilizations. Some one has said that *architecture is the printing press of all ages.* With such a broad interpretation of this art, then, is it not both reasonable and legitimate to include it in the school curriculum? Can not children of the upper ele-

mentary age find profitable experiences in using surrounding buildings as textbooks? Can they not learn from these buildings that man has left a permanent record of past ages in these monuments which, seeing, we see not and, knowing, we know not?

The curriculum of to-day is filled with scientific and industrial material. Curriculum makers say that the selection of such material is most essential to the development of the child because he lives in such an age. True, this is a scientific age crowded with cold logic, formal classified data, and scientific experimentation. These trends are brought daily to our consciousness through our publications, our industrial agencies, and other publicity media. Mass production, material supremacy, and mechanical efficiency have become our watchwords. We must, however, parallel these trends with broad fields of æsthetic expression and appreciation. We must align the products of a Phidias, a Michelangelo, and a Frank Lloyd Wright side by side with the products of a Louis Pasteur, a Glen Curtiss, and a Henry Ford. Should we not become as conscious of beauty and its story as we are of the development of the automobile industry, the story of milk, or the evolution of the airplane?

With these ideas in mind the following unit of work was developed with a group of sixth grade children. The purpose of its development has been, therefore, to kindle an interest in architecture as an art, to instill an appreciation for its beauty, to familiarize children with some of the world's most famous buildings, and to equip them partially with some practical standards by means of which they may evaluate and interpret their surroundings.

The environment of city children everywhere is replete with these stimulating materials. Whether in the north, east, west, or south, there are few urban communities which are not erecting new buildings or attempting to re-model older structures in line with present day tendencies. Of all the possibilities for choosing units of work from the immediate urban environment, architecture has probably a more legitimate basis for selection than many of those chosen. Although a greater variety of buildings is available for the city child, the child in the rural section is not entirely deprived of first-hand experiences. Courthouses, libraries, schools, public buildings, and shops are built in all parts of the country. They require much the same steps in planning as the skyscraper or the apartment house. Architects must be consulted, styles must be decided upon, plans must be made, buildings erected, and equipment installed. Ornamental details for decoration are used in rural buildings as well as in city buildings. For these reasons, then, there seems to be legitimate reason for including the story of these buildings as a unit of work in the school curriculum.

The study has not been centered upon immediate surroundings alone. An attempt has also been made to bring about an understanding of the tremendous influence which the early civilizations have had on the architecture of to-day. One cannot possibly arrive at any comprehensive understanding of the present trends and influences without going back into the past.

Before this unit of work was initiated, the teacher made a tentative pre-view or pre-plan of the possible activities

and intellectual content which she thought might be involved in such a study. This plan was very broad and comprehensive because she had no way of foretelling in what direction the unit might tend until she had worked it through with a group of children. However, details of procedure and definite requirements were omitted from this first view of the unit. Nevertheless, the teacher did not fail to provide for as many possibilities as she could foresee, even though she knew that all of them might not be developed in the classroom. Her knowledge of the nature and demands of the average sixth grade child guided her in assembling materials which would impart a rich intellectual background for this study of world architecture.

The following outline represents the first brief plan which she had in mind as she thought through this unit of work:

I. Major Objectives in Teaching the History and Appreciation of Architecture.
   - A. To advance and then substantiate the theory that man's environment controlled and directed most of his activities and his accomplishments.
   - B. To show how man's life and ideals have influenced his architecture.
   - C. To make clear why the architecture of to-day differs from that of ancient times, and why the ancient temples, in their turn, differed from the buildings of primitive man.
   - D. To bring new meanings of fuller significance to the content material of this unit of work.
   - E. To note certain trends and tendencies which are seen in all forms of architecture.
   - F. To provide a genuine, child-like situation in which learning can be accomplished.
   - G. To make legitimate use of the immediate environment.

II. Agencies within the Environment to be Used for the Purpose of Stimulation.
   - A. Beautiful and outstanding buildings within the immediate environment.
   - B. New buildings in the process of construction.
   - C. Excursions to see architectural displays, exhibits, models, and reproductions.
   - D. Excursions to museums and similar places of exhibit to present the historical background essential to an understanding of architecture.
   - E. Classroom bulletin boards with suggestive architectural pictures and exhibits.
   - F. Constructive material suggested throughout class discussions. Examples: clay for making casts, plasticine for making keystones, etc.
   - G. Current newspapers, magazines, and books.

III. Intellectual Background and Concepts Needed to Interpret the Unit of Work: Architecture as a Continuous Evolution.
   - A. Beginning with the crude and necessary form of shelter created by primitive man, followed by
   - B. The simple and significant forms of early civilization as exemplified in the architecture of Assyria, Babylon, Chaldea, and Egypt, followed by
   - C. The highly developed temple-building period of the Greeks, which inspired
   - D. The complex types of Roman architecture—the great forum, the aqueducts, and the public buildings erected to shelter and to stimulate government activities.
   - E. Then, passing through the age of the early Christian movement which was responsible for the great cathedrals of the Middle Ages, man next reverted to
   - F. The classical forms of buildings, reminiscent of the ancient architecture of Rome and Greece, which furnished the designs for the Renaissance periods and thence into
   - G. A period of new meanings in architecture in which structural materials were significant factors—the period of modern and contemporary building.

IV. Activities, Other than Purely Intellectual, which may Profitably be Outgrowths of Interest. (*It is hoped that many ac-*

tivities will be suggested by children's reactions. If not, the following possibilities may enhance the strictly intellectual material of the unit)

A. Making a blue print.
B. Designing a keystone.
C. Making a plaster of Paris cast.
D. Making a keystone in plaster of Paris, or plasticene.
E. Shadow-graphing.
F. Dramatizing a play.
G. Preparing an assembly program.

V. Bibliography. (*Not reproduced here inasmuch as the bibliography printed in Chapter XIV includes all the books suggested by the pre-view.*)

The content material of this unit of work is rich with possibilities for study, but the teacher was anxious to enrich it further by the addition of a wide and varied range of activities in which the children could participate. As she analyzed the topic, she foresaw a greater number of possible enterprises than any one class might be able to complete in a year. However, despite this fact, she planned for a maximum number of these activities because she felt that she, as a leader of the group, should be prepared to meet and supplement the suggestions and plans of the class. Her plans were not prepared in order that she might impose her suggestions upon the children, but rather that she might be ready to help them in outlining or planning for the enrichment of the study. Therefore, she included in her pre-plan a great variety of activities which she visualized as possible stimulating enterprises for the class to undertake.

In addition to these provisions she also analyzed the content of the unit for possible methods of presenting the

material to the class. She knew that certain problems would arise and that leading questions must be met. She tried to foresee the initiation of the unit in the classroom and the set-up she would provide for stimulating the interests of the class. For her own purposes she made the following detailed outline:

I. Some Possible Questions:
Why does New York build such tall buildings?
Who determines how high skyscrapers are to be built?
Why do not the people of our city live in private homes?
What provisions are made in city apartments for sunlight, air, and ventilation?
Why are the newer buildings so different in style, decoration, and plan?
Of what materials are these buildings made?
What determines the kind of building to be erected?
Why are the foundations for apartments so deep?
How is water carried to high apartments?
Why is steel used for framework of apartments?
What is a house plan, who makes it, and how is it made?
Where do architects get their ideas about architectural form?
Has man always planned his buildings? (See authentic reproductions of kinds of homes built by primitive, prehistoric, and ancient peoples.)
How has man through the ages utilized the materials at hand to construct his home?
How has his environment influenced his activities?
How did architecture come about?

II. Some Possible Topics: The introduction of study materials which trace the outstanding periods of the development of architecture and civilization, emphasizing the following points:
A. Primitive man did not consciously build his home. He found shelter in caves and other natural structures.
B. Prehistoric man built crude structures of materials at hand —stones, trees, dried skins, sod, etc. He made use of the beam and lintel principle. These homes were built for shelter with no thought of style and few decorations.

C. Ancient nations planned consciously and deliberately for their homes. Their buildings were more than shelters. The temple was the most beautiful building; it was inspired by religious ideas. Among the contributions of the outstanding nations are:

1. Egypt: Temples, tombs, pyramids, obelisks, etc.
2. Persia, Chaldea, and Assyria: Palaces and temples with terraces and platforms; buildings with realistic ornamentation.
3. Greece: Temples and public buildings of great beauty and simplicity. Use of columns and lintel, ornaments of sculptured figures.
4. Rome: Copied Greek styles and modified them by using rounded lines, domes, arches, vaults. Outstanding buildings are: amphitheaters, aqueducts, triumphal arches, and the Colosseum.

D. Since the time of the ancients, architecture has undergone well-defined changes. The outstanding periods are:

Romanesque (modified Roman, using round-headed doors and windows, thick walls, buttresses, and rose windows; grotesque figures and carved stone for decoration).

Byzantine (domed style with many domes over one building; used rounded angles and windows; used rich mosaics and marbles for decoration).

Gothic (the great cathedral period; used pointed arches, vaulted roofs, spires, pinnacles, traceried windows; used grotesque figures for decoration).

Renaissance (more decorative and fantastic than Gothic; known as the reawakening of classical architecture; used few towers, but made extensive use of the dome).

Modern (men's desire to plan buildings as expressions of the machine age; the use of new building materials).

Futuristic (following the trend of modern development, a new style of architecture will evolve which will express sensory impressions and the fitness of building materials).

III. Possible Stimulation Activities:

A. Making use of the immediate environment through excursions to and observation of outstanding buildings in New York, such as the Chrysler Building, the Empire State

Building, the Riverside Church, the News Building, the Master Building, and the Roerich Museum, the Notre Dame church, Columbia library, etc.

B. Visit to the Metropolitan Museum of Art, the American Museum of Natural History.

C. Activities and intellectual content.

1. Making blue prints (show actual blue prints, if possible).
   a. How does an architect make a blue print?
      Materials needed: tracing paper, linen paper, India ink, blue print paper, printing frame, dark room for arranging paper for the print, bright sunlight for printing, cold running water for fixing the impression.
   b. What are the advantages of making blue prints?
   c. How much would an architect charge for this plan?
   d. How does the contractor make use of it?
2. Preparing notebooks
   Clippings, reports, maps, illustrations, etc., showing extent of each individual child's study.
3. Making clay models, molds, and molding. A study of architectural details found on outstanding buildings throughout the ages.
4. Designing and making individual keystones. Stress upon specific attitudes and skills in workmanship.

IV. Other Possible Activities:

A. Seeing and studying
   Paintings, books, charts and graphs, magazines and newspapers, photographs, lantern slides, motion pictures, travel bulletins, commercial pamphlets, models, bulletin board displays of suggested or possible activities.

B. Collecting and classifying a shelf of books which might be used in answering questions or in suggesting additional activities and study.

C. Painting pictures and posters.

D. Oral reports to the class by pupils of items and topics of interest and study.

E. Verifying and summarizing data acquired through study.

F. Preparing an assembly program to share with the elementary school. This assembly might take any of the following forms: original dramatization, story presentation of

the history of architecture, showing and explaining lantern slides dealing with some phase of architecture, or showing shadow pictures of architectural details.

G. Designing and making costumes for the assembly.

H. Individual expression of impressions derived from the story of architecture.

The teacher realized that her part in the initial steps of this study was to make the child conscious of the new buildings being constructed in the city, to reveal to him the possibilities of architecture, and to help him formulate a few basic principles by means of which he was to become aware of the beautiful buildings around him. At first, undoubtedly, the children would ask innumerable questions. Why does New York have so many sky-scrapers? Why do other cities not have so many? Why do many churches look alike? Why do they have steeples? Why do so many buildings have columns on them?

In searching for the answers to such questions, the class would meet many new terms and perhaps notice for the first time many unfamiliar architectural details. These would need to be studied and explained before they could be fully understood. The study would lead perhaps into a consideration of the different periods of architecture and how they came about. When this study had advanced to a certain point, the children might begin to notice that the earliest civilizations had very definite types of architecture, each symbolic of a people or a nation. The teacher might show them that these types are basic to a further study of building and designing; that they are the patterns which influenced subsequent construction. The deeper the children went into the consideration of these

topics, the more fully convinced they would become that the architecture of a nation or a race portrays the activities of that people; that the decorations and symbols on their buildings are typical of their environment and reveal the story of the kind of age in which they lived.

From such considerations as these, there might arise specific questions unfolding possibilities of still deeper study. For example, the children might inquire: Why was Egyptian architecture so massive? Why were Egyptian temples more beautiful than Egyptian homes? Where did the Egyptians get the massive blocks of stone with which they built their pyramids?

These related questions would lead the class into the various fields of parallel study involved in this unit. In other words, the study of a beautiful building could not be approached unless the children considered the influences of the geographic, religious, and historic background of the people who designed and built it.

As the plan for presenting the story of architecture progressed, the teacher realized more fully the limitless enrichment it should bring into the lives of these children. Not only should it add to the fullness of life for the child at his present age level, but it should furnish a rich cultural background for the future. The teacher felt that the children who shared in such a unit would have very unusual opportunities for learning through personal observation and study the basic factors and influences which determine and direct successive civilizations of the world.

The pre-view, while rich in suggestions, could not be so inclusive as the actual study carried on by the children. The influence of their personal reactions and suggestions

would necessarily tend to direct the unit in line with their interests and would add valuable content not foreseen in the teacher's pre-view. As the teacher conceived this topic, she was impressed by the wealth of suggestions found in the development of such a study and she was confident that it contained valuable content for sixth grade children. However, her own personal convictions were not sufficient to determine the final choice of this study for she was confronted with many questions and problems as she tried to outline the unit. Among them were such questions as:

How can such an extensive and mature study be called a unit of work?

What justification can be offered for using it as a curriculum study?

Will it be of real value, not only to children in large urban centers but to those living in smaller communities as well?

Does such a unit draw on all fields of information and skill? Is it truly meaningful?

Will the child have opportunities to assemble and organize facts and data of sufficient difficulty? Will he see new relationships?

Such questions demanded serious consideration before the teacher could decide definitely whether this was a legitimate study unit or a camouflaged play interest. To help establish her own thinking the teacher applied to this unit certain of the criteria which have been made by the elementary teachers of Lincoln School. In the light of them she judged the worth both of the activities and of the intellectual content. It was not possible, however, to complete her evaluation of the unit from her pre-view. Some of the criteria were applied before the study

was initiated in the classroom. Others could only be applied as the classroom study developed. At the conclusion of the unit of work, however, the teacher again applied her criteria and evaluated the worth of the unit in terms of them.

Criterion I.—Does the material come near enough to the child for it to be real to him?

While the study of architecture might not suggest itself to the child as a real problem, the approach is simple and natural because of his urban environment. The skyscraper certainly is within the city child's own immediate environment. Buildings are all around him wherever he lives and many of them are beautiful, but he has accepted them without questioning. Probably he has not had time to notice them especially; probably he has not felt the need to study them, to see their beauty or their significance. He may have been directed to watch how things work; to count and to differentiate between the makes of cars or brands of oil and gasoline; to contrast mechanical processes. He has been made conscious generally of those things which have to do with industrial development, but too often he has not been made aware of the æsthetic elements in his city. These are vital influences in his life and he should be helped to appreciate them. Questions about the whys and wherefores of mechanical processes need not be neglected, but neither need they be the sole directing forces in his everyday living. Once he is aware of the full significance of his environment the child becomes more conscious of details both of mechanical and æsthetic values and worth.

As the teacher analyzed the environment of the New York City child, she felt satisfied that the material of this unit of work is very near to the child. The reality of it is obvious, for the city child lives in the midst of continual construction and rebuilding. In the neighborhood of the school many new and imposing buildings were being erected. The business section of the city was being enhanced by new skyscrapers and civic centers. In the neighborhoods of their homes the children were conscious of building activities or proposed architectural improvements. There were many controversial issues raised in the daily papers and other current publications about some of the new buildings being erected. The children were aware of these issues, for they heard them discussed in their homes and they themselves frequented many of the buildings under discussion.

In view of these evidences, the teacher concluded that the study of architecture met the demand of the first criterion. In addition, the unit of work also filled an urgent need for the enlightenment of the children who were living in the midst of these building enterprises. They required an understanding of architectural development in order to interpret their immediate surroundings and to evaluate the work of their city.

Criterion II.—Does the unit give opportunities for real intellectual pursuit on the child's present mental level?

During the course of such a unit of work as the one herein described, innumerable childlike questions are bound to arise. Some of these are mere surface questions. Others are irrelevant at the time. Questions of the first

type may be dismissed at once without too much consideration. The answers to those of the second character may be held over and later answered or combined with more comprehensive questions of which they are a part. The alert teacher is always sensitive to questions for they show her the trend of thinking in the class. However, surface questions in themselves seldom indicate great intellectual curiosity. The thoughtful or meaningful questions are the keys to the situation. Seaching out the answers to them furnishes real intellectual pursuit. These answers, in turn, raise problems which necessitate further investigation and thus the study evolves. It is in this connection that the tool subjects function naturally and vitally. These subjects of study are drawn upon for information, for verification, for organization, and for experimentation. The use of tools for this purpose brings about a definite intellectual growth.

Running through the lists of formal subject matter, the teacher finds that the study of the story of architecture cannot be carried on without them. For instance, the following uses of mathematics might possibly function through one single phase of the study:

Geometric design based on rose or wheel window.
Symmetry—circles, their areas; angles; triangles.
Mathematics of the cathedrals—broken arches, thrusts and counter-thrusts, vaulting, pointed arches, flying buttresses, mystery of numbers (3, 7, 9, etc.) and their use.
Graphs—showing architectural periods, influences, growth, etc.
Trusses—the triangle as a geometric form holding its shape; tension and compression, distribution of pull, kinds (bowstring, lattice, scissor, lenticular, panel, beam, etc.)
Comparison of other geometric forms.

The intellectual content which may be involved in this study is almost limitless. At one time history may receive major emphasis. At another time geography may be the point of contact. But no matter which phase or branch of content material is considered, that selection is primarily important because of its function, because of its immediate need to decide a point in question. The teacher analyzed the content material involved in this unit and found that it not only gave opportunities for intellectual pursuit, but also that it challenged and stimulated serious thinking and study. It appeals to the child of sixth grade level because it makes use of his immediate environment and helps him to understand the significance of some of the activities of the city. Through his own self-initiated interests and activities the child develops an appreciation for the processes involved in the planning and decoration as well as in the actual construction of buildings. The historical and social background gained through the study give richer meanings to the humbler work of the artisans, as well as to the masterpiece of the artist.

Criterion III.—Does the unit stimulate many kinds of activities thus providing for individual differences?

The content growing out of this unit of work shows limitless possibilities in the field of genuine activity which challenge the abilities and special talents of individual children. At the same time these activities may awaken new interests which might reveal and animate dormant talents that have never before been manifested. In the field of Fine Arts alone the demands and possibilities are

almost inexhaustible. In this unit of work such activities as the following presented themselves with insistence and rendered inactivity almost impossible:

Sketching architectural details observed on the way to or from school.
Making designs for blue prints.
Creating a symbolic cover design for notebook or program cover.
Modeling in clay to express their feelings for some definite design—such as a decoration on a keystone.
Making a plaque, designing it to illustrate some phase of architecture.
Creating and designing an original symbol indicative of personality and aspirations. This symbol was often used as a substitute for initials or signature.
Portraying in original pictorial composition the most appealing phases of the unit.
Making exact drawing of figures and forms.
Making stage sets for the presentation of a play based on some phase of the unit.
Selecting architectural details in historic costumes.
Making an exhibit case.
Creating an original design for a rose window.
Cutting and soldering glass for a rose window.
Making block prints for cover designs.
Cutting stencils for a shadowgraph.
Making book plates.
Designing and making costumes for rhythmic dancing.

The more practical and mathematically-minded child may develop an understanding or mastery of the principles of the keystone and the truss, the geometric design of the rose window, the dome over a square area, and other architectural principles based on mathematical or geometric patterns.

The children whose major interest is literature have an opportunity to delve into the folk-lore and literature of the people who helped to develop certain styles of architecture, to browse in the realm of biography studying the lives of the great architects and master builders of all ages, and to respond to the beauties and æsthetic appreciations as expressed by the poets and great prose writers.

The fundamental skills are called into function naturally through this unit because of the urgent demand for their constant use. Reading is an essential tool and must be done intelligently and accurately in order to contribute to class discussions and to answer questions or help to solve problems. As the unit on architecture developed in Lincoln School class-made charts of various kinds were kept on classroom walls to record pertinent concepts or relationships, to serve as reference material when needed, and to represent graphically the unfolding development of the art of the "master builders." A working bibliography was developed as the study progressed. Some of the books included in this list were kept in the classroom library, but other books (such as general course material) could not be taken from the school library for so long a time. Therefore, the children had to make more frequent use of this more highly organized general library. To do this effectively they had to know how to use the library intelligently and efficiently.

Perhaps one of the most satisfactory results found in this unit of study was the vocabulary growth of individuals. New terms were found almost daily, new meanings were attached to familiar words, and the class discussion periods gave a new impetus to the use of a more

mature vocabulary. Written reports, labels, and notebooks required the use of specific and accurate terms. This was no mere exercise in "putting it over" or in garrulity; the need for words grew out of a real demand for accurate, clear expression. Increased power in choice of words and breadth of expression came about through the actual need to say something clearly, concisely, and intelligently. A class glossary was made of the new terms met in reference books or introduced through discussion and study. Each child kept a vocabulary list in his notebook and the lists differed as individuals differed. The strength and direction of interests could be gauged to some extent by these lists.

Typical glossary pages are included here in order to show the scope of vocabulary expansion for one child.

GLOSSARY [1]

Frieze: A band between the architrave and the cornice; usually ornamental.

Monolith: A single large stone shaped into a pillar, statue, or monument.

Lintel: A beam forming the top of an opening to carry the wall above.

Molding: A molded surface running along continuously in buildings so as to bring out shadow, light, and half light.

Hypostyle: A structure, with or without walls, the ceiling of which is supported by columns.

Entablature: The structure consisting of architrave, frieze, and cornice resting on the columns (Classic Architecture).

Abacus: A slab that is used to crown a capital.

Acanthus: A plant whose leaves form the lower part of the Corinthian capital. This plant is the thistle.

Entasis: A swelling or outward curve on the outline of a column.

Column: A vertical support consisting of base, shaft, and capital.

[1] Wherever pupil material has been presented in this volume, it has been given in unedited form.

TERMS USED IN GOTHIC

Pinnacle: A small spire used to give weight to a buttress or angle pier.

Turret: A little tower at angles of a larger tower.

Crocket: An ornament of curled or bent foliage projecting from sloping edge of a gable or spire from Fr. *croc*—a hook.

Spire: A steeply tapering roof surmounting a tower or tower-like structure.

Tower: Bell, belfry, military watch, etc. A structure designed with a view to elevation; may be on a building or isolated.

Gargoyle: A water spout named from gurgling noise of water going through them.

Groin: The solid angle formed by the meeting of two vaults.

Poppy heads: Finials or other ornaments at top of bench heads, pews, or stalls—may be small human figures or heads, carved images, fleur-de-lys, etc.

Finials: Finishing ornaments at apex of a spire, sometimes a bunch of crockets.

Bosses: Ornaments carved on ends of keystones or ribs of groined roof.

Criterion IV.—Does the unit bring about growth from the present growth level to the next step?

In evaluating the worth of this unit the teacher took into consideration the ages, the grade, and the experiences of the group who would participate in it. She was familiar with the school experiences and records of most of the children. She knew that a majority of the class had engaged in other units of work in former classes. She knew that they had been granted the privilege of freedom of thought, freedom of action, and freedom of expression. From their previous training the children were well-equipped to carry on a program of work similar to the one which she had outlined in her pre-view. Their class records showed her the achievement scores for the pre-

ceding year and the kind and extent of subject matter studied during the fifth grade.

The records of these children showed also that their previous school experiences had been rather specialized in the fields of scientific discovery, invention, and certain factual elements of life in a mechanical age. The teacher felt that further emphasis on such experiences at this time might tend to develop a one-sided individuality. For this reason she was most anxious to add some æsthetic note to their school experience in order to give fuller breadth or completeness to their outlook. She felt that the children were over-sensitive to questions about such topics as: how machines work, how the airplane is manipulated, why the sun does not burn up the earth, and how primitive man learned the secret of fire. These inquiries were prompted, more or less, by previous classroom experiences and they had certain values. However, after five years in the elementary school the children had found satisfactory answers to similar questions and the teacher felt that they should be able to carry on these individual interests independent of class study. In other words, the teacher felt that these manifested interests reflected the limiting experiences of their school life and she was anxious to add new interests equally as important which might stress beauty and æsthetic appreciation rather than mechanical or scientific efficiency and practicability. These older interests were not to be discounted, but they were to become more significant in a new setting.

The teacher was familiar with a large number of the out-of-school interests and activities of many of the class.

Having taught older brothers and sisters of some of the children she knew the ideals and the practices of the homes. While few of the children come from families of great wealth, they all come from homes of culture, refinement, and appreciation. Naturally these factors should contribute to the fullness of living for each child; but, paradoxically, these same factors may also become baffling handicaps and obstacles. With so much being done for them, children may easily lapse into indifference, boredom, or idleness. The teacher recognized the duty of preventing such a condition and the opportunity afforded to stimulate æsthetic interests.

There is probably no more difficult educational problem than that of evaluating the all-round growth and development of the individual child. We can readily answer questions about one angle of this growth by consulting the charts which record the results of specific factual attainments in a unit of work. But this objective evidence is of far less importance than the data which would help us to answer such questions as:

Has Harry developed into a more tolerant person?
Has Ruth seen the futility of trying to make an impression when we all know that she's not coöperating with us?
Does Lois attack a problem with more intelligent planning?
Does Donald give more generously of his effort than he did formerly?
Has this unit of study helped Joe to overcome his reticence?
Has Margaret learned to think through a problem before she offers the solution?
Has Jim's persistency been directed towards worthwhile attainments?
Has Jean become a less selfish and less self-satisfied person?

The answers to such questions as these are strongly indicative of the development of the group. Only the teacher who is a vital member of her class group and who has vigilantly watched its development is capable of saying whether or not the chosen unit of study has brought about such growth. She may be able to cite specific instances when external reactions were made manifest, but she cannot give positive proof that general growth and development are taking place. She knows within herself, however, when progress is made, because she is so closely in touch with each child and his problems that every word and mannerism reflects for her his mental and emotional state. No test or check upon these individual accomplishments has been prepared, for the answers to such questions are found solely in conduct and in social behavior. Class spirit is nothing more than group reactions. When individual satisfactions, ambitions, interests, and acceptance in a genuine situation have been secured or aroused, the teacher is reasonably sure that she is providing opportunities for general development.

This pre-view of possibilities of child development must be in the teacher's mind before the unit of work is chosen. If the selected unit does not seem to lend itself to such a scrutiny, then another unit of wider range and broader scope must be substituted.

Intellectual pursuit is placed ordinarily at the head of all classroom activities but, as such, it is usually considered in its most limited sense. It is restricted by adult interpretation of education which usually is an outcome of reflections upon former personal school life and experi-

ences. Therefore, tool subjects, mechanical processes, and memoriter learnings erroneously become ends in themselves. As *means* to an end they function to an important extent, but only as a means do they contribute to general child development. Intelligent and frequent use of these tools in class discussion, in written work, and in giving oral reports give occasions for frequent and purposeful practice. By utilizing them, the teacher provides the opportunity in which growth and development may take place.

Constant individual checking of production—both for quality and quantity—should be carried on, so that the teacher and the child together can see if one piece of work is of a higher type of workmanship than the preceding one. Clear thinking is a challenge in any unit, so the better the unit provides for genuine thinking the stronger its educational significance becomes. Teacher and children must all be keenly alert to every possibility for real learning, and must welcome opportunities to check the accuracy of fact and concept obtained through the study.

Criterion V.—Does the unit stimulate a desire on the part of the individual to proceed on his own initiative?

Following the trend of interest and enthusiasm through classroom activities or study, an observer may pass judgment on the validity of a unit of work. But when children are stimulated even beyond classroom jurisdiction and direction, even the most casual observer may say that their interest is genuine. So long as a teacher or a class may direct interest in a given channel, then results should be obtained. But when a child of his own initiative carries out in his free time certain interests or suggestions

growing from classroom discussions, then initiative is being developed.

Answers to such questions as the following will help to determine whether any unit of work has been effective:

What are some of the things the children did of their own initiative?
What are some of the salient problems for further study found by children in their individual related activities?
What new leads or "carry-overs" grew out of individual pursuits or suggestions?
What unforeseen possibilities within the environment were brought to light through individual investigation?
What obvious environmental possibilities were ineffective in helping individual children?

Citations of a few specific instances [1] noted during the progress of this unit of work are given here. They illustrate some of the ways in which the teacher's acceptance of this criterion was justified.

Several children at different times went to the Museum of Art. These trips were reported by mothers whose children had demanded the visit. On one occasion, four different children met in one of the corridors of the museum. They were surprised to find each other there, but after their first greetings they spent the remainder of the time comparing notes, discussing problems, or showing illustrations which they had bought during their tour of inspection.

One child made a second trip to the museum to verify a date which had been quoted in a reference book. She found a difference of opinion which baffled her, so the problem was reserved for a class discussion period.

[1] Other evidences of carry-over are cited in Chapter VIII.

Some of the children, knowing that their fathers had business and personal relationships with architects, persisted in their demands to talk with these men. In several instances parents invited these friends to dinner in order that the children might hear real architects talk and explain some of their plans. These informal occasions also gave the children opportunity to ask questions and to obtain first-hand information on construction, style, or other kinds of data needed by the class.

One of these situations was responsible for the addition of a much needed study help for the reference library. A particular architect was so much impressed by the enthusiasm of one of the boys that he sent him a completely annotated bibliography of books on architecture. Furthermore, he marked in red crayon those books which he thought the child would be most interested in or could most easily read.

Two children were shown through a certain building which they admired. When they came back to school a few days later they gave the class a report of their experiences.

Four children searched for pictures to illustrate their notebooks. Two of them ordered pictures by mail; two went to the museum and bought photographs of buildings and architectural details.

Twelve pupils through their own initiative came to own architectural reference books in addition to those used by the class.

One boy made his own collection of interesting quotations about architecture.

Another boy tried to prove to the class that a keystone

was not necessary in an arch. He brought all of his experimental materials from home.

A boy brought in a typed copy of the laws of the setbacks of the modern skyscraper.

Two boys begged their parents to let them go out at dusk to visit two buildings near their homes. They wanted to see the effect of light and shadow at that time of day. They measured the flutes on the columns of the building and found the number of flutes on each column. The following day the boys gave a joint report of their findings.

Towards the closing days of the school year one of the mothers sent this note to the teacher, which is self-explanatory.

MY DEAR MISS BARNES:

At one-thirty on Thursday, the twenty-ninth, we close our apartment and move to the country. The clothing has already gone, but each one of us is to carry with him anything other than clothing which he considers essential to a successful vacation.

You will, I believe, be interested to know that Frank's bags contain: 1. violin music, 2. an ocarina, 3. two pieces of linoleum to make block prints, 4. Moore's *Gothic Architecture*, 5. Wynne's *Architecture*, 6. Barstow's *Famous Buildings*, 7. Fletcher's *History of Architecture*, and 8. his own architecture notebook.

Cordially yours,

Aside from such manifest outside interest, the children were largely responsible for bringing the home influence into the classroom. By their genuine interest, their diligent study, their keener alertness, the children gradually

won over the parents' interest until they, too, became contributing members of the group.

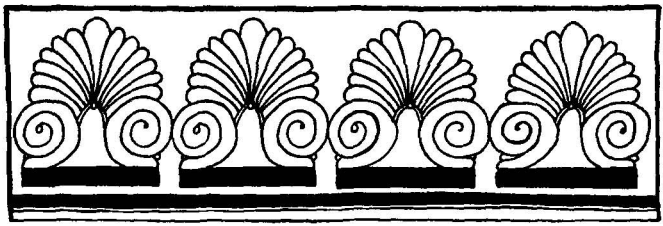
Criterion VI.—Does the unit furnish a real intellectual content, thus aiding in building a cultural background?

The very word *architecture,* if interpreted to mean more than just construction, is rich in intellectual content. It connotes the æsthetic and cultural. One cannot derive the fullest enjoyment from a study of world architecture without acquiring the necessary background to interpret its function. Mere knowledge of forms, patterns, and styles is the least of the acquirements needed for appreciation. One must have acquired a knowledge of the *motives* impelling a people to express itself through temples, castles, or cathedrals. He must have learned the reason for and the significance of decorative details before he can read the messages conveyed through these forms. He must know the history of the nations which sponsored and inspired the construction of these buildings so that he may intelligently interpret them as records of man's creative genius.

Victor Hugo describes architecture as "the great handwriting of the human race." It records the life, the history, the literature, the art, and the science of world civilizations. In a word, these silent monuments reflect and interpret the scope of human interests and activities from the birth of the human race. From them we learn how mankind has lived and progressed through the ages. They are the most accurate records that man has left us. Interpreting the function of architecture in its broadest sense, the teacher sees through it the unfolding story of

world history. Harmonious blending and development of all possible appropriate responses are sought by those interested in the child as an individual entity. As one checks this unit against the criteria set by the teacher, he sees that it provides for varied rich opportunities and consequent all-around growth—intellectual, social, and emotional. It provides also ample opportunities to practice judgment, coöperation, and other desirable habits of work in a joyous and harmonious environment.

From the results of as thorough an analysis of the study and as careful a measurement against the criteria as was possible to make before the classroom work was in actual progress, the teacher was encouraged to initiate the unit. She had solved some of the problems and answered to her satisfaction some of the questions raised by the pre-view. She decided that this study could legitimately be called a unit of work. Its content was rich in possibilities for educative activities, for valuable first-hand experiences, and for concentrated study. It likewise held the essential elements for fostering and developing an æsthetic appreciation of the human race. The story of architecture as thus conceived provided also for practice in almost all the subject-matter branches deemed essential for sixth grade children. With the exception of cooking all the other requirements could be foreseen as functioning naturally throughout the study. That all the curricular activities could not be read into the unit did not deter the teacher from preparing to approach this study when she met her sixth grade class in the fall of 1929.



Chapter II

THE CLASSROOM APPROACH TO THE UNIT

THE account of this unit of work represents the activities and procedures of two successive sixth grade classes of Lincoln School. The record covers a period of two years' time and includes results for each of these classes. Generally speaking, however, this presentation is devoted chiefly to the development of the unit with the sixth grade class of 1930-1931, the second group to follow this theme of architecture.

Each year the teacher used a different approach to the study, adapting materials, plans, and methods of work to the personality of the class. Since the curriculum of Lincoln School is broadly conceived and planned, and has no static grade placement restrictions, the teacher felt free in the details of her planning to follow the suggestive leads and interests of her classes. Prior to the initiation of the history of architecture the major study for the sixth grade had been the history of records. From her accounts of this study and from the expressions of interest

among the children she knew that the new unit should present a broad view of world progress. From what children's experiences, then, should she select the initiation or approach to this unit of work? There were possible approaches through science, through political history, through the arts, through literature, through economic world problems, through social relations, or through definite and prescribed textbook procedures.

However, the teacher's basic philosophy of education excluded all approaches that did not provide for a maximum number of personal first-hand experiences and activities. She held as a major premise that any chosen unit of work should provide also for many avenues of presenting and evaluating the cultural background of world civilizations. These restrictions and a consideration of past experiences in the group narrowed the field of choice.

During her summer vacation of 1929 the teacher had spent some time studying new lists of books on many subjects appropriate for children of sixth-grade age. As she read, she compiled titles and subjects of interest which were based on children's experiences gained through investigation and from their immediate environment. Before the opening of the fall term the teacher had decided to present the stimulation to the unit through an extensive display of pictures, photographs, postal cards, and charts. These were to be exhibited on the classroom bulletin board. She hoped thereby to arouse the children's curiosity about the purpose of the display and to stimulate a series of questions relating to the pictures.

She knew that those children who had traveled abroad would recognize many of the buildings and would help the other children to identify them.

When she first met her new class, she had not anticipated the immediate initiation of the study. She thought that the children should have time to make an adjustment to their new classroom environment before she built up a setting to serve as the introduction to the unit of work. She also knew they would have many tales to narrate about their vacation experiences. During the recounting of these interests the children frequently had great difficulty in expressing themselves clearly and coherently. Some of them floundered and talked all around the subject, but seldom made themselves understood. Their accounts were rambling and boresome. The teacher realized that she must do something to help them with the organization of their material and point out to them the necessity of concise and accurate description. A situation arose during one of these periods which was the impetus for the subsequent initiation of the work. A child was trying to describe a mechanical device used on a sailboat. The children were not impressed with what he was saying, nor did they seem to follow his account. The teacher, sensing this restlessness, turned to the child and asked abruptly, "What is a doorbell?" The question amused the children, for it had no bearing whatsoever on the discussion in progress. The teacher explained that, while it was not related to the discussion, the answer to such a direct question might help the speaker to express himself more clearly. When the class saw the reason for this interruption, they tried to answer the question

concisely and accurately. Among other answers a doorbell was defined as: a thing that rang, a buzzer, a contraption on the front door, a bell. What the teacher was aiming at by asking this absurd question was an exact definition, clearly and adequately stated. For some time several of the children tried to define a doorbell. Eventually, a definition, satisfying the demands of both the class and the teacher, was evolved.

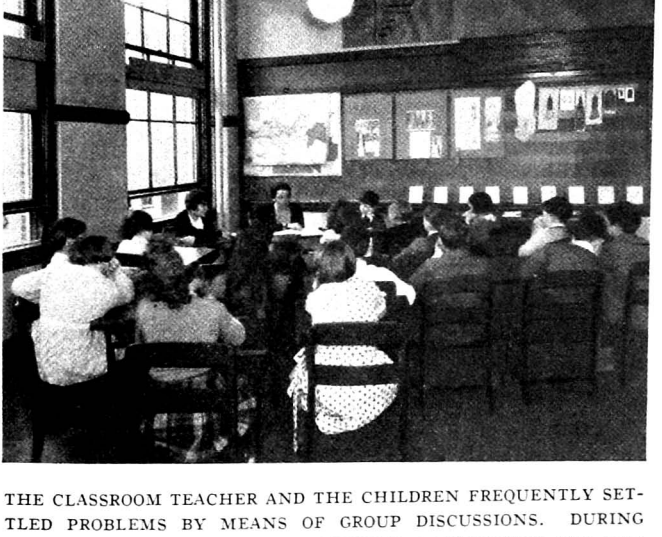
It is a long distance from doorbells to Grecian temples but nevertheless this doorbell discussion led directly to a consideration of homes, houses, and buildings in general. This certainly was not a studied approach, but one hit upon accidentally. Interest in this topic launched an interest in architecture before the teacher had the opportunity to set the stage for the approach to the unit.

From the discussion of doorbells the teacher led the class through such questions as:

Do you live in a house?
Do you live in an apartment house? Why?
Why do not all the people in the world live in apartment houses?
How long have apartment houses been used?
Who is responsible for the height, size, location, and plans for them?

Some of the children had the erroneous idea that houses as separate dwelling places were found only in the country, while apartment houses were typically dwelling places for city folk. This came about, no doubt, because most of the children move from city apartment buildings during the summer months to take up residence in country houses. Some of the children had never given

a thought or inquiry to the building activities in the city; they took them for granted. They had always lived in apartment houses; they had always been surrounded by neighboring apartment houses. So they took for granted that this condition was universal. It was too obvious for



THE CLASSROOM TEACHER AND THE CHILDREN FREQUENTLY SETTLED PROBLEMS BY MEANS OF GROUP DISCUSSIONS. DURING THESE DISCUSSIONS THE INTELLECTUAL BACKGROUND FOR THE INTERPRETATION OF THE UNIT WAS DEVELOPED

investigation or inquiry. They were somewhat familiar with historic buildings, both in their own country and in Europe, but these were places to see when one was touring or sight-seeing. The teacher asked the children if they thought these historic buildings had any influence on our present day buildings; if these older forms of architecture

had affected the style or decorations of some of the New York apartment houses or public buildings. When their attention had thus been called to the matter, the class responded with the hypothesis that certain trends and influences could be detected in some of our modern buildings.

"There is the Columbia library," said one child. "It reminds me of several buildings I saw in Europe. They were all old buildings, too."

Other children noted similarities in structure and decoration. The class interest was challenged through this approach, and the children were aroused to study through the subsequent questions which were raised by the class. The teacher began to direct this interest and enthusiasm towards concentrated study to find when, where, and how architecture had received its inception. In general, the teacher knew the outstanding facts on which she might base the progress of the study. However, she did not feel herself the master of necessary details, so this first venture was one of mutual queries, study, and comparison. She tried to follow the interests of the class in building up a balanced conception of the evolution of beautiful buildings from the earliest times to the present, and even beyond—to the probable buildings of the future.

No child could approach this study intelligently without wanting to know about the *people* and the *society* for which these buildings were constructed. This was the common meeting ground on which all the elements of the anticipated unit met and received inspiration for more intensive study.

During the initiation of the unit the second year the

enthusiasm of the preceding group had a decided influence on the incoming class. The new pupils had heard stimulating rumors in the halls; they had seen exhibits of the former class; they had enjoyed their assemblies, and they were curious about the study which had so engrossed the preceding class. It was but natural, then, that when they were given the opportunity to help outline their plans for their year's work they should decide almost unanimously to continue this study of the story of architecture. Their purpose, however, was not to repeat the exact work of the first class, but rather to use the findings of that group as an outline to further study.

The teacher likewise had a purpose for wanting to continue this study: namely, the recording of class experiences as a basis for this publication. However, she did not want to decide arbitrarily that the new class should have no part in choosing the major emphasis for the year. There are many controversies in educational circles regarding the learning resulting from a teacher-chosen theme for class study. There are those who claim that the child should be the sole voice in making the selection. Then there are others who claim that the teacher because of her mature judgment and experience should not only direct but make the final decision also. With this controversy in mind the teacher in this instance approached the new class with the leading question of what the children would select for a unit of work for the year.

Excerpts taken from a daily record kept during these first days show how and why the decision was made, and

how for another year the story of architecture became the dominant theme of the sixth grade.

TEACHER. If you had your choice, what would you select as the unit of work for this year?

[*Teacher wrote on the board the choice of topics suggested by different children. The following list shows typical requests:*]

Bull fights	Airplanes	Architecture
Stars	China	The United States
Birds and their nests	Primitive man	Spain

TEACHER. After all, are these interests general or individual? Would they be worthy of a year's work in the sixth grade?

[*The children agreed that such topics as bull fights, stars, or birds had limitations and were not of such sufficient breadth to constitute a controlling interest for the year's work.*]

DONALD. They [the topics] can be taken up for study in connection with some bigger unit.

TEACHER. What is a unit of work?

JOE. Something all the class is doing.

MARGARET. Things the whole class is studying about.

DONALD. Something that holds the year's work together.

TEACHER. What would you say if this year *I* chose the unit for study?

JIM. I think that would be best. Each one of us is interested in different things that do not go together.

JOE. If we choose the unit, we'd make it too easy. It is best for you to choose it, because you know us and the unit better than we do.

LOIS. Yes, for some of our suggestions are not broad enough.

TEACHER. A unit must include something larger than a single interest, I think.

[*General assent from the class.*]

The teacher then recounted the story of the doorbell and the initiation of the story of architecture with the preceding

class. The children were interested in her account and began to ask questions about the modern buildings then being erected in the city. The discussion is given as follows:

TEACHER. In what kind of an age are we living?

ELLEN. The machine age.

[*The teacher then explained how we in the city are surrounded on all sides by machinery, by construction, and by excavations. She also introduced the idea that most of us are so engrossed in the material aspect of things that we are not often conscious of the beautiful.*]

TEACHER. I think that our unit this year will have something to do with beauty—beauty as we practice it in our daily living. Carl, do you live in a house?

CARL. Not a real house of our own. It is an apartment house.

TEACHER. Are there any houses near your apartment house?

CARL. No, only more apartment houses and a few churches.

TEACHER. Do apartment houses in general look alike?

MARGARET. Most of them do.

TEACHER. Do churches have any features in common?

BILLY. Steeples.

TEACHER. Are steeples usually similar in shape?

BILLY. Yes; they all point.

TEACHER. For what are steeples used?

CHARLOTTE. To keep the bells.

JOE. No, that's not true. Most of them are just decoration.

LOIS. Most of them are too small to be used.

TEACHER. A church is a building for a particular purpose and nowadays churches usually resemble most other churches in general form.

[*Here personal experiences were recounted and led the discussion away from the subject of apartment houses and churches.*]

TEACHER. What kind of house does the Eskimo build? Why doesn't he build it in a pyramid shape?

[*Through discussion the teacher developed the concept that the Eskimo igloo is perfect in shape for its material*

and for its environment. Time was taken during this discussion to develop the meaning of word environment.]

TEACHER. How does the man of the torrid countries build his house?

BILLY. He plans his house to suit his surroundings.

JIM. He builds with materials that keep off the sun and let in the air.

PAUL. He builds according to his environment. Houses have to be different in different surroundings.

TEACHER. What do you mean by that, Paul?

PAUL. Well, I mean—a man has to build his house of whatever he has to build with. He has to think of the climate and the temperature and the conveniences that he needs.

TEACHER. Are skyscrapers all alike?

CLASS. No!

TEACHER. What makes them different?

[*Lists on the blackboard the following suggestions given by the children:*]

Decorations	Suitability to foundation conditions
Signposts for aviators	Setbacks
Usefulness	Materials
Suitability to climate	Cannot stand wind pressure
Suitability to location	Purpose
Names	
Shapes	

[*After listing these suggestions the teacher raised the question with the class whether all these topics had the same bearing upon the differentiation between skyscrapers. She pointed out that several of the topics stressed the environmental reasons for differences; others were resultant differences which had nothing to do with the question. For instance, "signposts for aviators" did not make one apartment house different from another, whereas "purpose" made an essential difference in the type of building. The class reorganized their topics, grouping statements under the headings which she had given them.*]

TEACHER. Who decides what the shape of the building is to be?
KATHRYN. Architect.
TEACHER. What is an architect?
ALBERT. The builder.
CARL. The owner.
CHARLES. In Greek it means "the best worker."

[*Discussion of the difference between an architect and a builder.*]

TEACHER. What is in the word *architecture* to help us understand its meaning?
ELIZABETH. Art.
TEACHER. What do you understand by the word *architecture?*
JIM. Everything about buildings and how they build them.
PAUL. Statues to beautify buildings.
HARRY. How people live in their environment.
CHARLOTTE. How people have built for a long time.
TEACHER. When did architecture begin?
BILLY. Nature is an architect, so it began when the world was new.
JOE. Egyptians began it.
ELIZABETH. No, it starts with the tree dwellers.
TEACHER. We usually say that the beginning of history marks the beginning of actual planning how and where to put up buildings. Did the early people sit down and consciously plan the architecture of the country?
DONALD. No, people first needed a place to live in.

[*The argument about the meaning of the word architecture was thus initiated. Several children referred to dictionaries to find the definition of the term.*]

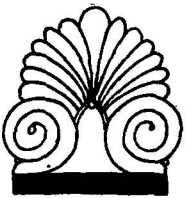
PAUL. Webster says that architecture "is the art and science of building."
TEACHER. Yes, buildings must be both practical and beautiful. However, we are going to be more concerned this year with the beauty of buildings. We can't all agree on our ideas of beauty, but we can find out what are the principles on which beauty is founded. Our tastes may differ, but we can agree on these principles. Use your eyes and you will

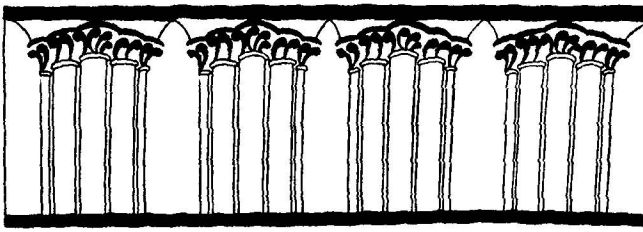
discover architecture all around you. Try to find what other people think about architecture. See if you can make up your own definition of the meaning of architecture.

Thus the teacher's preconceived plan was adopted whole-heartedly by the group and was put into effect at once. The success of this plan of choice by the teacher was evinced a few days later when Kathryn said that she was glad the class had taken the teacher's plan.

"Does it really make any difference to you who suggests the unit?" asked the teacher of the class.

They responded, "Not a bit."





Chapter III

PERSONNEL OF THE CLASS

ABOUT twenty-three children were enrolled in each of the classes carrying on this unit of work. Of this number most of the children had been in Lincoln School for several years. In each class one child had been promoted from the fourth grade and therefore needed additional help in making the adjustment to a new group and to more advanced subject matter. Special tutoring had been given during a part of the summer to prepare each of them for the work of the sixth grade. Both had the mental ability to make this double promotion, so the extra study provided during the summer vacation had no deleterious effect upon them either physically or nervously. Their social adjustment was not difficult either, for they had been in the school for several years and they knew most of the children in the new group.

In the second class there were six children new to the school. One of these came from a public school outside New York City; two more had been enrolled in schools

in other countries—one in China, the other in Greece. The remaining new entrants had been enrolled previously in two different private schools in the city.

The age levels for the second group ranged from nine years and four months to twelve years and ten months. On page 62 tables summarize the distribution and central tendencies of the mental and chronological ages. Graphs are also given on pages 63 and 64 which show the accomplishment scores in standardized tests.

The children came from homes representing a wide range of wealth, education, and social attitudes. The school is always desirous of obtaining helpful coöperation with the home. Both work for the complete development and adjustment of the individual. By pooling their experiences, the teacher and the parents come to a better understanding of the personality traits and behavior reactions found in a typical group of normal children.

The classroom environment helped somewhat in directing these tendencies of trait and behavior. Conferences between parents and the classroom teacher, or of the classroom teachers, special teachers, and the school psychologist helped in discovering the basic causes for some of the undesirable behavior reactions. After such diagnoses, remedial measures were suggested and acted upon. If the child did not respond to this help, further conferences were arranged and new measures were devised until the child showed tendencies of better adjustment to the group.

Intelligence tests and standard achievement tests are given to each class in Lincoln School. When a new child

seeks admission to the school he is tested by the school Psychologist before he is placed in his group. In the elementary school there are two groups of each grade. This does not connote a division into accelerated and retarded classes but, rather, is a division planned for the purpose of grouping the more mature children in one class and the less mature in another. These divisions are not always brought about by differences in mental capacity. Usually, limited experiences, lack of contacts, physical health, or home conditions coupled with a particular character development are responsible for many of these cases of immaturity. The 1929-1930 group was made up of the more mature children. They showed great mental curiosity about the topics for study. Therefore their approach to the unit was more intellectual; they were more interested in the mental activities involved in the unit. The 1930-1931 group was largely made up of the less mature children. Their reactions to the stimuli found in their study were more social and manual than intellectual. This in no way reflects discreditably upon their mentality. It indicates, however, that they were less grown-up in interests, curiosity, and abilities. They were still directed by the manipulative impulse. The manifestation of these tendencies caused the teacher to adapt the presentation of the content of the unit to fit the demands of each class. As the class required more physical experiences with the materials for the unit of work, the teacher had to modify the treatment of the content material to provide for a maximum number of manipulative activities. This group found many new possibilities of equal educational value in the activity phase as the study progressed.

Illustrations of classroom procedures might help to clarify some of the ways by which individual children were helped in making their adjustment in the sixth grade.

The detailed records which follow show how classroom opportunities were used to help individual children to fit harmoniously into the social group. These reports show responses to a special set-up for the socialization of an individual child through natural classroom activities. Three reports are reproduced in order to show a variety of ways in which specific behavior reactions grew or were modified in functional situations.

Case A

Charles came from a formal conventional European school which was militaristic in routine. He had been accustomed to precise direction, rigid silence, restrained action, and perfect conformity to the will of the teacher. His work was exact, precise, and meticulous. He did reams of written work after a pattern, and excelled in the performance of those tasks calling for mechanical and automatic response. A casual observer might call him a student insofar as book learning was concerned.

Because of his former rigid control he was handicapped when he tried to express himself and this made him all the more hesitant, reserved, and selfconscious. At first his responses were largely monosyllabic and orthodox. He was not quite so sure of his conversational English as the other children for he had had less experience with his native language than they. He had been accustomed to speak English in his home, but not in school.

At first it was decided that, because of his age and size, he might make an easier adjustment in another class where he would be more nearly on a social and age level with the other children. His parents, however, insisted that more intensified

academic work was not what he needed. They realized that he must mingle with children of his own interests.

Fortunately, the class respected him and liked him for his honesty and his sincerity. The teacher feared, however, that the children would set him up as a paragon of virtue and thus would isolate him from many of the activities which he needed. She found every possible opportunity to avert this condition. She sought always to bring him into discussions and to get the children to work with him in group activities. His knowledge of languages and his familiarity with a large body of visual material needed in this study advanced him greatly in class estimation.

For a long time he was unable to enter generally into class discussions without signalling that he had a contribution to make. He sat and absorbed all the material discussed, adding to it in a terse and embarrassed way when directly questioned.

Early in October the Elementary School Council asked for the appointment of delegates to represent each class in the school's coöperative governing body. Because of his exemplary conduct, Charles was chosen as one of the delegates. This mark of approval was the starting point of the change in this child's attitude to his membership in the class. He was now an integral part of the group, a contributing member, and a vital personality in group enterprise.

Shortly after this event there was a call for volunteers to tell the general elementary assembly their summer experiences. Not one child in the entire group had such vital material and fascinating adventures to recount as Charles had. He wanted to coöperate, yet he was bound by his fear. Suppose he should make a mistake? Suppose he should forget his speech? The teacher assured him that this was not an assembly of memorized speeches, but one of natural sharing with each other a few of the good times enjoyed during the summer vacation. This was beyond his understanding. And how could one stand before an audience and be natural and spontaneous? The volunteers were each given a hearing in their own classrooms to decide which ones of the entire group had something

worth saying. Charles decided that he would volunteer. When the time for his trial came there was almost a reverential hush in the classroom. As he took his place at the front of the room he was embarrassed beyond words; his mounting color disclosed his discomfiture. The teacher gave him some help until he was started. His audience was so understanding, so humanely interested that he began to forget himself. There was no air of superiority nor of self-satisfaction as he recounted his European experiences; there was no show of worldliness, or boastfulness, or of pride. The children liked what he said and they were interested in the contrasts which he pointed out. He felt great satisfaction in what he had done, for the questions and responses of his audience had proved to him that he had made his points. His initial venture gave him confidence. However, due to a majority vote for these activities, the nature of the program changed to a retelling of summer camp experiences, and Charles was deprived of his privilege.

Then the teacher consciously set to work to provide situations in which he might more easily overcome his reticence. He became highly interested in the time charts shown in some of the reference books and expressed a desire to include one in his note book. The teacher suggested that, in addition, he might make a chart for the room. This was the key to his socialization. The chart was large and intricate to make. As the work progressed, various children asked him if they might help him. He enlisted the services of a few of the class leaders who felt honored thus to be chosen.

A little later in the year Charles had the opportunity to speak to the children of the Elementary School. As a Book Week activity, the Elementary Council in coöperation with the school Librarian, collected books from the children to send to a school in the Middle-west whose school library had been destroyed by fire. As senior representative from the Council, Charles was called upon to make the general report about the distribution of these books. This occasion really was forced upon him by reason of his position, so he had no

choice in the matter. He talked over with the teacher the points he wished to make. The day before the program he went to the auditorium to try his voice in the large hall. Here he was given some help in the organization of his report and in his delivery. On the morning of the assembly he was outwardly calm and composed. He started falteringly to give his report, forgot his organization, and stumbled over the beginning sentences. In a moment, however, he had recovered himself and began again to make his brief report. This time it went smoothly and clearly. Later, in conversation with the teacher, he admitted that the great number of faces in the auditorium had confused him at first, but then he remembered that they wanted to hear his report, so he did not look at his audience, but rather focused his attention on a spot in the rear of the room.

In December the class began making a stained glass window. All the children submitted designs. It seemed almost inevitable that they would choose Charles' design; but to the relief and satisfaction of the teacher another child's pattern was accepted. This was the first instance in which the class considered another child his peer.

Committees of children worked together on this activity. Charles, as chairman of one group, worked with three other children—the designer of the pattern, the proverbial lazy boy of the class, and a wholesome chatterbox of a girl. As the work progressed, many lively arguments arose which were not settled arbitrarily but through discussion. This group work was especially good for Charles because no one member of it was completely submissive or docile. Charles and the chatterbox had many lively encounters. He was more natural in the group and soon was fighting for his right to suggest and to lay plans. Before the window was completed his responses were more nearly in line with those of the other children.

One day during a period of intermission the teacher came into the room unexpectedly to find Charles in physical struggle with one of the boys. He did not cease his efforts when he

saw her, but concentrated upon downing his opponent. This was his very first evidence of self-assertiveness. The children were anxious to see how the teacher reacted to this misdemeanor, but she said nothing. One of the children drew her attention to the matter.

"What do you want me to do about it?" she asked. "Must I treat him differently from the way I treat the rest of you?"

That put Charles on equal footing with other children and it established him more securely with the group. Thereafter he was seldom consciously singled out, but was given equal opportunities with the other children. He was always looked upon as better equipped to do detailed and accurate work, to think through problems to logical conclusions, and to pass sounder judgment; but he gradually lost his position of perfection as he became "one of the crowd."

Case B

When Paul entered the sixth grade he was nervous, irritable, and tense. He had a slight defect in his speech which gave the impression of *baby talk*. If spoken to about this handicap, he became embarrassed and confused. His responses were muffled and incoherent. Frequently, he was asked to repeat these responses two or three times before he could be understood. At these times he became irritable and very often his tone was abrupt and insolent. The teacher was concerned about these reactions, yet she felt that the speech difficulty was too great a handicap to be overlooked entirely. She tried by every possible means to establish a natural relationship between the child and herself, but he remained aloof and suspicious. Whenever the opportunity for natural correction was presented, the teacher tried to help him to speak intelligently and coherently. Instead of being helpful, as she had hoped to be, she found that she was becoming almost a menace to the child. His nervousness increased, his rate of work was retarded, and he began to show evidence of dissatisfaction in his work.

This dissatisfaction came really as a result of the child's

lack of speed in carrying a problem through to completion. He spent hours of labor perfecting his work, but he never finished an assignment at the same time as the other members of the class. His work was meticulously perfect and organized, but he was always the last one in the class to finish a topic. Naturally the teacher tried to speed up his work, but she tried to do it without making him feel that he was being pushed. She set definite dates for receiving his material; she provided special periods for him to continue his work. Still he lagged behind. Instead of meeting this emergency fairly, he found excuses for his slowness and even stayed away from school on days when his materials were due.

The teacher, in the meantime, had conferred with the child's mother and had consulted with teachers who had taught him in the lower grades. They all acknowledged his slowness and his speech deficiencies, but excused him on the ground that he had grown very rapidly. The records of his intelligence and achievement tests showed that he had a very keen mind and had stood high in his academic attainment. The mother added that his slowness at home was as annoying as it was at school and that, rather than wait patiently until he had completed a task, someone else would assume the work assigned to him. Consequently, though he started many jobs, he never quite finished any of them on time. The teacher suggested to the mother that such practices should be abandoned and that the child should be held responsible for completing any work which he assumed. The mother hinted that family irritability might be somewhat responsible for many of his nervous mannerisms. She said that the child was constantly being chided for his slowness, and on these occasions he became surly and tense.

Shortly after this interview the child was ill and was absent from school for several weeks. He was not seriously ill, however, so while he was at home he was able to spend a part of each day preparing his note-book material.

A few days before he returned to school his physician conferred with the teacher about the many handicaps against

which this child was working. He had been extremely nervous all his life and in recent years had been threatened by chorea. In addition he was more or less the victim of a teasing older sister who made use of every opportunity to torment him. She called him a "slow poke" and a "snail," and delighted in rushing through her own work in order to contrast his slowness. The mother herself, somewhat impatient and intolerant of the child's retarded action, found fault with him and nagged at him "to hurry up" or "to move faster." The effect upon the child was only that which could be expected. He shirked work and other obligations whenever he could. He became silent and sulky. He resented all suggestions for self-improvement, and he detached himself from social contacts. The situation in the home was serious but possible to change.

The teacher's problem was more acute for the child's complete adjustment to the school situation was the crux of the matter. He was becoming so self-conscious that his work showed the effect of his embarrassment. He found that he met with similar reactions from the class and from the teacher. The suggestions offered by the teacher were in line, if not in tone, with the censures of his family. He confided to his physician that his teacher was too demanding and expected too much and too perfect work from the class. He felt particularly that she was never satisfied with anything he did. He resented the teacher's effort to break down his undesirable habits and expressed his wish that she would leave him alone.

The physician did not ask that the child be relieved from his obligations, but recommended that less pressure be held over him and more praise be given him for the work which he *did* accomplish.

By the time the child returned to school the teacher had formulated a new plan in accordance with the doctor's suggestions which she hoped would help Paul to overcome some of his difficulties. He brought back a notebook so complete in details and so neat in appearance that it solicited the highest praise from all who saw it. The enthusiasm was genuine, the

praise was sincere; so the setting for the teacher's plan was unconsciously arranged.

Accompanying this high degree of workmanship on the notebook was a rich fund of general information which made the child quite an authority on the subject of architecture. Whenever a controversial point arose, both the teacher and the children referred to him to supply missing data or to offer his opinion. This was no artificial by-play set up by an anxious teacher to have a child re-establish himself. The child was capable but not confident, so opportunities had to be provided for his ability to become functional. Consequently, every possible situation in which the child could become a contributing member was seized upon. No mention was made of any time pressure, no time limits were set for finishing an assignment. The teacher consciously deferred calling for his work until she felt sure that he had completed it. Soon he began to feel a little power, a little confidence in himself. The approbation of the group gave him the encouragement he needed. Eventually he was less self-conscious, less embarrassed when making his contributions. He gradually became less tense and began to see humorous situations in the classroom; his attitude towards the teacher changed also. Whether or not he associated her changed relationship to him with her conference with his physician could never be ascertained. But, gradually he became more amenable to social situations, and even accepted criticism more kindly, but he still retained many of his nervous mannerisms.

Towards the beginning of the second semester a commercial photographer came to school to take some flashlight pictures of classroom activities. This provided a new situation in which Paul had to find himself. All the other children accepted the situation naturally and easily; but the moment that this activity was mentioned Paul showed fear and alarm. His life seemed to be involved in an ever-widening circle of fears. Each new situation was so fearful to him that he could not make adjustments to it. When the photographer was making preliminary arrangements, Paul found several excuses to get

away from the classroom. The teacher watched his manœuvers but did not interfere with any of them. His curiosity about the photography drew him back to the classroom time after time, but he never seemed to relax. He kept watching the photographer and he steeled himself for each explosion. He had a most unhappy time. Another day a classroom photograph was being made which required an intimate, social-grouping pose. The teacher talked naturally to the class and conducted the discussion as though there was no photographer in the room. The topic was an engrossing one so all attention was focused on the teacher. No one was even conscious of the presence of the photographer. All at once there was an explosion and the photograph had been made. Paul looked around, startled for an instant; then, realizing how foolish his other fears had been, he smiled.

Each of these forward strides marked a decided change in Paul. Soon he was able to take personal criticism in a more friendly way, and was not even resentful when his speech carelessness was corrected. His rate of speed did not become alarmingly accelerated, but his general attitude became so much better that new ways of attacking problems, short cuts to solving them, and a more efficient means of accomplishing tasks could be suggested to him. His determination to do his work well, his application until a task was finished, his concentration upon details all stood him in good stead.

These valuable attributes were needed by this type of child, but they were not sufficient to make him happier or to equip him to adjust to many new situations. Parallel with nurturing these qualities there was needed also an additional impulse to assume a social and a mental equality with children of his own age. These applied measures were not the panacea for all of Paul's ills, but at least they set the pace which, if followed intelligently, will establish him as an estimable citizen.

Case C

Helen is a healthy, normal, and an active girl with intelligence somewhat above average. Her scholarship is not out-

standing nor are her work habits especially commendable. She lacks concentration and application in her study. Most of her time is spent in *getting ready* to work, consequently, she is more or less of a distracting and disturbing element in the classroom.

Helen is an only child of a self-supporting widowed mother. She is left alone during most of her out-of-school time; therefore, she has developed a mature sense of resourcefulness. Her mother's business activities deprive Helen of a companionship which she craves. The mother, because of her limited time with the child, has to assume an intellectual and scientific attitude towards the child's development. She has concentrated upon her physical, cultural, and religious training, but has omitted most of the possibilities for her social growth with those of her own age. The child's circle of friends is made up almost exclusively of adults—her mother's friends, her music teacher, her Sunday school teacher, or her choir mistress. Her most intimate playmates are chosen from children much younger than herself. She dominates these children, sometimes almost to the point of tyranny. With her own classroom groups she has never been popular nor successful. She is more or less of an outsider, a negative member whose force of personality has seldom been felt.

In her own way she has sensed this situation and has rationalized her predicament. By controlling situations and by forcing herself into the foreground she can become a class entity. The means of achieving this end are of minor consideration. Social irregularities, garrulity, and monopoly of time and attention are her weapons of defense. These responses have become so automatic with her that the mere presence of an adult is a signal for her to bring them into action. So long as she is the center of interest and attention she is content. Without being fully conscious of the demands she puts on adults, she depletes them by her physical vigor and her persistency. Her remarks are not always coherent or intelligible, but this makes no difference to her. "Talk for attention's sake" seems to be her motto.

From the first day of school in September she strove to impress the new teacher by "playing up" to her. Fortunately the teacher recognized her surface characteristics and soon let the child know that these manifestations failed to register the desired impression. Whenever Helen became loquacious the teacher by analytical questioning tried to show her the aimlessness of her remarks. The children caught the cue from the teacher and they, too, became very critical of her remarks and showed that they resented the loss of time due to her rambling, disorganized conversation. Whenever she tried to monopolize situations or discussions she felt the effect of class disapproval. More than once she was reminded that she was but one of a group of twenty-two. Ordinarily such severe treatment might have been injurious to a sensitive child, but Helen's exterior was difficult to penetrate. Class criticism did not make her more reticent; it only helped her to be more careful of contributing to class activities. She gradually learned to think before she spoke, thereby reversing her usual procedure.

Some of her later contributions were decidedly worth while and added materially to the advancement of the class. Her sense of fairness and justice was quite mature, as also was her ability to make adjustments to new situations. Thus when she found herself in a new environment and under a new system she did not become introspective or self-conscious. She came to recognize her position in the class and to know the futility of her efforts to overcome and to impress the teacher. Old habits are difficult to change though, so frequently she lapsed into her former rôle.

The teacher, though more strict with Helen than with most of the children, never allowed herself to become caustic or antagonistic towards her. She recognized the handicaps under which the child worked and lived, but she held her constantly to a high standard of group membership. She was strict and critical when such treatment was needed; at other times she was humanly concerned with the child's progress and development.

Like most of the children in the class, Helen also was pre-

paring a notebook in which she compiled many of her findings and observations in connection with the unit of work. It was not a scholarly piece of work; in fact, the contents were pointedly meager. When questioned about this, she assumed an attitude of complacent satisfaction with her lack of data. However, when confronted by a comparison between her notebook and the average notebooks, she maintained that she intended to add a great amount of illustrative material somewhat after a recent book she had scanned in which the author had told his story principally by pictures. The teacher was familiar with the book, so she was able to overcome her arguments by proving to her that the author had written explanatory accounts or detailed captions about each picture, thereby acquainting the reader with the information needed to interpret the picture. The child had overlooked this treatment in scanning the book, and she had no excuse left to offer for the meagerness of her notebook. She then analyzed its contents and talked over with the teacher the possibilities for improving her *Picture Book of Architecture*. From that time, she worked diligently to add to the details included in her notebook. It may have been a feeling of competition with accredited class leaders or it may have been a desire for praise that prompted this new interest, but whatever the cause she applied her every effort to this work.

Gradually her notebook filled up with pertinent notes and descriptions equal to some of the most thoroughly compiled books in the class. In order that this activity might not be merely a manipulative creation, the teacher in individual conference checked the extent to which the data had been mastered.

After Christmas she reasserted herself on innumerable occasions as standing for a definite principle. One occurrence especially elevated her in class estimation. In an athletic competition during a gymnasium period there was some display of unfairness and partiality. Helen resented this, not from a personal point of view, but rather as a matter challenging the group's sportsmanlike reputation. She asserted herself to the

group, as also did several others. The matter was taken up at a later discussion period in the presence of the classroom teacher and the Physical Education teacher. Most of the girls retracted their statements at this conference and were inclined to fall in line with and accept the excuses and the hypothetical solutions offered. Helen, however, maintained her position and asserted her contentions in a frank, unabashed manner. She let it be known that failure to support a right principle was equivalent to betraying a trust. Eventually her persistence brought some of the other girls to ally themselves with her. Through their efforts a pernicious situation was revealed which helped to explain their critical and resentful attitude towards the gymnasium period. When this became known, both the classroom and the gymnasium teachers were able to devise remedial measures for correcting unfair treatment and for organizing the girls into a more harmonious group.

Somewhat later in the year, one of the other teachers reported another praiseworthy incident in which Helen figured prominently. Dramatization is one of the interesting activities provided during the weekly creative work period. Helen chose to join this group. Each Wednesday afternoon this group met with one of the teachers to dramatize stories or incidents which appealed to them. Frequently, the group prepared a special dramatization to present to the entire elementary school. In one of these Helen was chosen for the major rôle. Up until the day of the dress rehearsal she practiced this part. Her acting, however, was unnatural and theatrical throughout the rehearsal periods. The day before the public presentation she was particularly impossible. Another child appearing in a less important rôle prompted her frequently and, once or twice, showed her how the character should act. The teacher was impressed by the dramatic sense of the helpful child. She suggested that this child should substitute for Helen during one rehearsal. From the side lines Helen then could see how the character should be portrayed. The suggestion was made only to help Helen to

improve her own dramatization. She accepted it graciously and became an interested spectator during the rehearsal. At the conclusion she rushed to the teacher saying, "Virginia does it so much better than I did, that I think she should have the part for tomorrow." The teacher was quite embarrassed, for she felt that the child had misinterpreted her suggestion. However, Helen insisted that such was not the case. She knew that Virginia was less self-conscious than she was and, therefore, was likely to give a better dramatization. The two girls got together over the matter and settled it finally. Helen exchanged parts with Virginia without any display of heroics. Furthermore, she stayed after school and without any adult suggestion altered the costume for the new rôle.

The commendable feature of this action is that no one outside the dramatization group knew about the exchange. Even then, it would probably not have been known if the teacher in charge had not revealed the situation. Helen's classroom teacher was most gratified by this action for it proved to her that the child was acting on principle and not in hope of praise.

These specific instances of changed behavior reactions are but a few of the many manifestations of a more amenable and thoughtful child. Greater responsibilities could be placed on her; greater demands could be made of her. In a word, she was more socially minded and responsible than she had been a few months before. All this had been accomplished without undue strain or self-consciousness and without definite training in ways of behavior. The teacher's rôle had been one of watchful waiting, of utilizing real situations in which the desired behavior reactions were activated naturally and modified toward social ends.

The following graphs and tables show the results of the standardized tests given to the sixth grade class of 1930-1931.

The ranges and medians of the chronological and men-

tal ages of the second group at the beginning of the school year are shown in Table I.

TABLE I.—CHRONOLOGICAL AND MENTAL AGES
GRADE VI—OCTOBER, 1930

	CA Yrs. Mos.	MA Yrs. Mos.
HIGHEST	12– 9	14–7
MEDIAN	10–10	12–6
LOWEST	9– 5	11–3

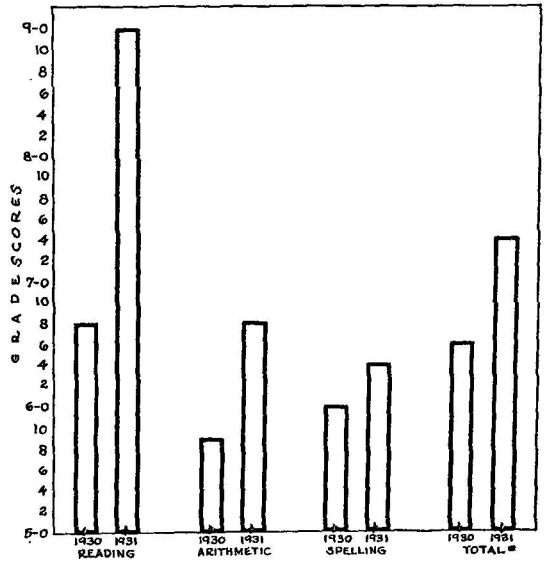
Table II shows the distribution of the intelligence quotients derived from the Stanford-Binet Intelligence tests. The IQ's ranged from 100 to 140 and the median was 110-114.

TABLE II.—DISTRIBUTION OF IQ'S
GRADE VI—OCTOBER, 1930

IQ Scores	No. of Pupils
135–139	2
130–134	1
125–129	1
120–124	0
115–119	6
110–114	7
105–109	4
100–104	1

The Stanford Achievement tests were given to this group in May 1930 at the close of their fifth school year. They were given again in May 1931, after the class had completed the unit of work. In Figure 1 the achievements in Reading, Arithmetic, and Spelling are shown for these years and from them the gains in these subjects may be computed. The total gains for the year may be ob-

served from the last pair of bars in this graph. Each of these bars represents the median scores of the group in terms of success in eight of the Stanford Achievement tests.



* THE TOTALS FOR 1930 AND 1931 ALSO INCLUDE ACHIEVEMENT SCORES FOR LANGUAGE USAGE, LITERATURE, HISTORY AND CIVICS, GEOGRAPHY, AND PHYSIOLOGY AND HYGIENE.

FIGURE I.

Figure 2 illustrates the gains made from May 1930 to May 1931 by individuals in the group as measured by the Stanford Achievement tests. Each line represents one child's composite score for a year's time and shows his grade score both at the beginning and at the end of the sixth grade. Data for both tests were available for only

20 of the 22 children because of changes in class personnel.

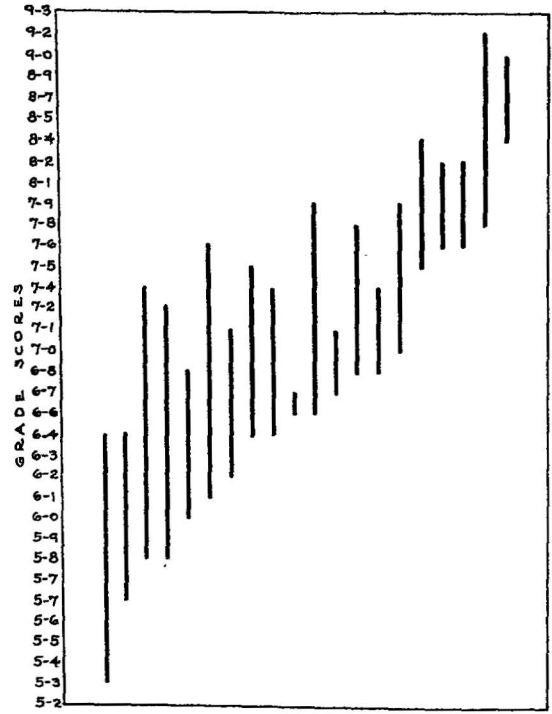
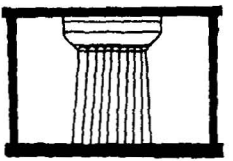
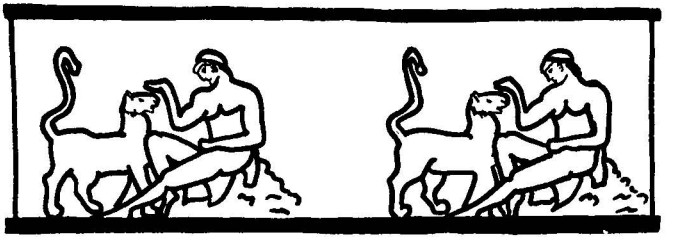


FIGURE 2.

The uses of the results of standardized tests in Lincoln School are discussed more fully in *Curriculum Making in an Elementary School* by the Lincoln Elementary School Staff (Ginn & Company, Boston, 1927), in *Psychological Service for School Problems* by Gertrude H. Hildreth

(World Book Company, 1930), and *Cumulative Study of Achievement in a Progressive School* by James Mendenhall and L. Thomas Hopkins (to be published in 1932 by Bureau of Publications, Teachers College, Columbia University). Those interested in the more detailed study of tests and measurements are referred to these publications.





Chapter IV

ACTIVITIES WITHIN THE UNIT

DURING the two years in which this study of architecture was the chosen unit of work for the sixth grade, a variety of activities, both intellectual and manipulative, were initiated through class interests. Some of these were individual choices either suggested by more inclusive class activities or they were undertaken by groups of children who wished to carry farther the inquiries and studies developed during class discussion. The former type of activities is discussed more fully later in the book. The purpose of this chapter is to present a few typical activities of general interest which were participated in by the majority of the class. Not all the classroom activities are described here for many of them overlapped or were a carry-over from more extensive group enterprises such as plays, summaries, excursions, or other experiences. Those described in this chapter are typical of the kinds and varieties of interests which paralleled the intellectual content or significant meanings of the unit of work.

While the children were centering their observation on architectural detail they frequently brought to school crude sketches of such details as they had noted outside the classroom. At first they were content merely to pin these sketches on the bulletin board after showing them to the class. The children enjoyed seeing the sketches, they took pride in the industry of those pupils who had made them, and they were enthusiastic in identifying similar designs and decorations seen elsewhere. But this alone did not justify the time and effort given to making them. Eventually the teacher directed the children to see the inadequacy of such a record because of its lack of organization and its lack of meaning. In other words, the teacher led the children from the mere "collector, immature picture-making and picture-cutting" stage to a higher level of accomplishment by holding them up to standards expected of an average sixth grade child.

The teacher pointed out that the bulletin board was not intended as an end in itself but as a means to an end, and that a display had no significance if it did not help to explain or to illustrate some principal phase of their study —in short, that the activities involved in collecting, mounting, and displaying materials is only valuable to the extent that it has *purpose* behind it. When the teacher had presented her argument to the children, they readily acknowledged that her reasoning was sound and agreed that their manifestations of interest (especially as illustrated by their heterogeneous displays) had been immature and lacking in thoughtful purpose. Gradually the children came to classify the sketches according to their use in particular periods. Eventually they found the

names and the uses to which these designs were originally put. It was no uncommon occurrence to hear such comments as:

"This egg and dart design is found on the capitals of most of the Ionic pillars in our apartment foyer."

"The bead and reel makes an excellent ceiling molding."

"The acanthus leaf design was not used on the Parthenon, for the Greeks knew that it was too *fancy* a design to use in a Doric temple."

"The Gothic arch is excellent for church use, for it seems to point heavenward."

"The Egyptian lotus leaf is as straight-lined as their temples."

As such discussions arose and as the unit of work was beginning to take form, the teacher recognized this as the opportune time to intensify the significance of architectural details and help the class to organize and to make permanent the variety of designs which they had collected. She proposed, therefore, that the children continue the work after dividing themselves into groups. Groups were formed according to interests in special periods of architecture. Each group set to work to find out more about the lives of the people who were responsible for the development of the different types of buildings. A suggestive outline of study was made by the class as a guide in collecting and interpreting the data found. The class agreed to spend some time on this intensive study and stated that by a specified date different members should be ready to make a report to the class on

what they had found to be pertinent in their investigation. To assist still further in preserving this information, the children agreed also to make individual notebooks which would contain any data or material which that child wished to include. By mutual agreement certain essential elements of all standard book-making were included in these plans. There were to be a title page, a preface, a table of contents and either an index or a glossary of new words and terms found and used during this unit of work. The details of these pages were left entirely to the choice of the individual child, however, and were not dictated either by the teacher or by the opinion of the class.

The suggestive outline made by the class for guiding each child in his own particular field of interest is given here so that the reader may see the amount of study needed before a child would be ready to give a class report. Generally speaking, all the outlines were similar. They were detailed more or less, depending upon the needs of the individual child who made the plan.

I. How this Particular Architecture Came About
   - Geography of the country
   - Brief history of the nation
   - Customs of the people
   - Religious ideas of the people

II. The Architecture
   - Characteristics
   - Details and decorations
   - Symbols

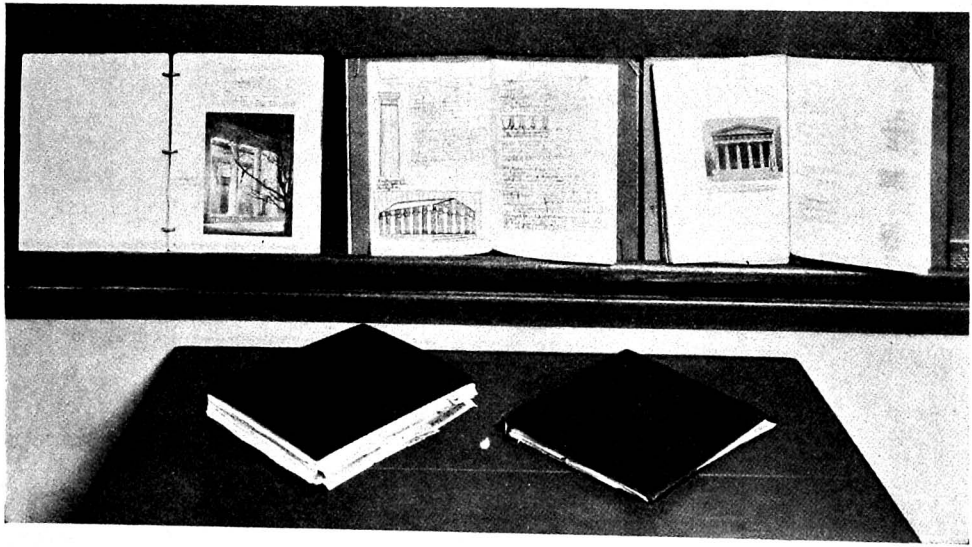
III. Famous Buildings of this Period of Architecture
   - Where built
   - Why built

By whom and when built (if possible)
Why considered famous

IV. Modern Adaptations
Are adaptations fitting? In keeping?
What influence is more evident in modern architecture?

The notebooks were used throughout the year. During that time a number of children assembled data for as many as eight different periods of architecture; no child had studied less than four of the principal periods. Some of the notebooks were written in the form of reports; others made use of captions describing the illustrative materials included. Wherever it was possible to compare or to contrast similar periods the child made use of parallel outlines. Some pages were made up entirely of pictures and clippings; some contained only an outline map of the country under discussion. There was no hard and fast rule limiting child activity in preparing notebooks, nor were these books in complete and final form at any time during the year. Even at the close of school several of the children expressed the hope of adding new material during vacation or while they were traveling.

Many of the sketches brought to the class by individual pupils were of sufficient interest and importance to be desired by all the members. However, no method of reproducing these sketches quickly, exactly, and in quantity had been suggested until one day, during a class period, the focal point of discussion centered around the means by which an architect preserves his own plans. Naturally this led to a consideration of blue prints, what they are and how they are made.



DISPLAY OF NOTEBOOKS SHOWING INDIVIDUAL DIFFERENCES IN METHODS OF WORK. ON THE TABLE LIE THE FULLEST AND THE MOST MEAGER NOTEBOOKS IN THE CLASS. THE THREE OPEN NOTEBOOKS ILLUSTRATE THE TYPES OF CONTENT MATERIALS USED BY DIFFERENT CHILDREN. ONE CHILD USED MOSTLY NEWSPAPER CLIPPINGS; ANOTHER COMBINED ORIGINAL DRAWINGS WITH SUCCINCT DESCRIPTIONS; THE THIRD COMBINED THE METHODS OF THE OTHER TWO.

"We could make blue prints of our architectural details, couldn't we?" queried one of the boys.

"Yes, then everyone could have a copy for himself," another child contributed.

And thus was launched another very worthwhile activity.

These children needed experience with this new medium of expression. The teacher had foreseen the possibility of such an emergency arising. She was not aware, however, of the exact form that it might take, but she was ready to help and to carry the activity forward when once the suggestion was made. The teacher realized, however, that this activity must not be merely of the "busy work" type; that it must have meaning back of it, and carry new meaning forward through the doing of it. Through class discussion the plan of action was set. The children were to note the symbols, details, and designs which they observed on buildings, and the specific use and location of the buildings were to be written on the sketches which would later be submitted during a class period.

Sufficient time was given so that all the children might have opportunities to make any observations, draw up their sketches, and make their notations. When these sketches were presented they proved to be a topic of great satisfaction and interest. The subjects of many of them were unfamiliar or not so generally known to the majority of the class. The teacher had foreseen this possibility also so she had set up a practical reference library of eight or ten books. These books were filled with clearly labeled sketches of details and decorations as well as descriptions of their origins and uses. The children

felt free to consult these references in order to identify and verify their sketches and to correct errors in their own designs.

Following this, the children traced on transparent paper the correct designs for the patterns which they wished to use for their blue prints. The Industrial Arts teacher was called into conference to give expert assistance at this stage. She explained to the children the importance of arranging their sketches on the sheet to insure a well-balanced spacing, and the need for exactness and accuracy of line if they hoped to make successful blue prints. When these pencil tracings were finished, each child made ready to work with the draftsman's tracing paper. A large piece of beaver board, thumb tacks, India ink, a round nib pen, and draftsman's paper were needed to carry on this process. As each child's tracing was found to be accurate and clear enough to be seen through the heaviest paper, he began his tracing. He covered his sketch with a sheet of draftsman's paper and fastened the two to the beaver board with the thumb tacks. Each paper needed to be held firmly and tautly so that the drawings would be smooth and even. Then the tracings were copied with India ink on this heavier paper and, when finished, put by to dry before the next step was taken.

The following period set aside for Industrial Arts was chosen as the time to make the blue prints. Since a special kind of exposure was needed, the children were taken from the classroom to a "dark room" in the shop where complete equipment was found. Because this is a very exacting step, the teacher worked with but part of the class at a time. The other children had individual prob-

lems to work upon in the classroom while the smaller group was making blue prints. With each group, however, the instruction, manipulation, and set-up were identical. The only point of variance came when questions were asked, or information was sought by separate groups.

The special teacher of Industrial Arts had charge of this class period. At the beginning of the lesson she showed samples of architects' drawings and a number of architects' blue prints. A discussion ensued based upon the need for making blue prints. The class had already learned that blue prints were merely duplicate copies of an original sketch and could be made in any quantity required. She contrasted with this measure of surety and expediency the time, expense, effort, and waste involved in making a separate and individual drawing each time the original sketch was not at hand or ready for use. She also explained to the class at length the composition and sensitivity of the blue print paper and the necessity of making these prints in the "dark room."

The children then began to make their blue prints. Two copies were made of each design, one for individual notebooks and one for general class record. Several periods were required for this activity.

Following these class periods one of the boys expressed a desire to experiment at home in the making of blue prints. He explained that he had none of the equipment, but that if he had the tracing paper and the sensitive blue print paper he felt confident that he could produce some very helpful results. A few days later he brought three sets of blue prints which showed the results of his ex-

A BULLETIN BOARD DISPLAY OF BLUE PRINTS MADE BY THE CHILDREN.

perimentations. Not having a photographic frame in which to expose his "picture" he used a piece of heavy cardboard. He took this improvised board to a dark cupboard where he attached the sensitive paper and the pattern to it with thumb tacks. He exposed this in the sun for the required time, then put the blue paper under a running faucet. He was disappointed with the results for he found that the marks of the tack heads had also been imprinted on his paper. Then he tried again, this time securing the papers on the cardboard by tying heavy twine along the four outer edges. When this set was printed the marks of the twine formed a frame around his designs. He was satisfied with this, but thought that he could print a set free from marks other than the designs. This time he secured the papers with short pins stuck through the cardboard. This set he pronounced perfect, for the marks of the pins were scarcely perceptible. When he brought these prints to the class he explained the processes he had used and the length of time for which each print had been exposed.

This activity inspired many of the children to carry on similar experiments at home. The results were all brought to school and posted on a bulletin board especially reserved for this purpose. Later these prints were distributed to their owners who added them to their notebooks.

One of the girls brought from home a set of blue prints of drawings which her father had commissioned an architect to make for the re-modeling of their country home. She told the class that if her father had accepted the architect's plans and contractors had undertaken the work,

the cost of the architect's service for preparing the drawings and blue prints would have been included in the contractor's bill. In this case the blue prints would have become the property of the contractor. However, since the project was not carried through, her father had to pay the architect for the prints which then became her father's property. Thus it was that she could bring them to school. The class was intensely interested in these plans and studied each line in detail. The legends accompanying the plans explained the meanings of the various symbols used by the draughtsman.

Another child secured through an architect of his acquaintance a roll of linen paper used for sketches. There was enough of this material that each child might have a small piece to continue his experiments.

All in all, this was a very worthy activity. It enlarged the experience of the class, it had innumerable educational possibilities, it stimulated self-activity and experimentation, and it brought satisfactory results to those participating in it.

Parallel with the interest in blue prints there developed a curiosity about the meanings of some of the details found in architectural designs. These details were found repeatedly, so the children concluded that they had some significance in the purpose of the design.

Beginning with more familiar trade-marks, the teacher began the story of their use in commercial advertising. Why do some firms use a special mark to identify their products? What do these marks convey to the buyer? Why and how are they protected from general usage?

The children collected a great many of these trade-marks and tried to interpret their meanings. In some cases they wrote letters of inquiry to the manufacturers asking for the meaning of the trade-mark used on their products. The more obvious trade-marks were easily interpreted satisfactorily in the classroom.

In describing these devices the children confused the terms *trade-mark* and *symbol.* They became interactive and thus assumed synonymity. Since their uses were not equivalent it was necessary for the children to discriminate in the application of the terms. They found definitions for each word, learning that a trade-mark is a registered mark used to distinguish one commercial product from another, while a symbol is a mark that stands for something else though it may neither picture nor suggest the object or the idea. Certain familiar symbols and trade-marks similar to each other in design were presented to impress the distinction between the two confusing terms. The Red Cross and the cross which is the symbol of Christianity were chosen as outstanding examples of the symbolic device. These were contrasted with the adaptation of the cross symbol used as a trade-mark to distinguish the products of one of the biscuit manufacturers.

To make sure that this confusion was overcome the children began to compile the meanings of symbols which they noted in architectural details. This list included some of the following information:

Symbol	*Meaning*
A length of chain	Strength
A pair of scales	Justice

Symbol	*Meaning*
A palm leaf	Victory
Egg and dart	Life and death
An olive branch or leaf	Peace
A serpent	Wisdom
The horn of plenty	Prosperity
The lyre	Music
The hour glass	Time
The four leaf clover	Good luck
The horseshoe	Good luck
The peacock	Immortality

The origin of symbols was considered at length. The children found that, in the beginning, symbols were more than ornamentation. They were devised for the purpose of teaching the people who saw them. In those early days few people could read so the symbol became the sign by which people could recognize and identify the meanings conveyed by these devices. The real meaning of symbols was expressed when one child in the class said that "symbolism was the shorthand of the early peoples."

Since the class interest was associated with ecclesiastical architecture the children searched out another list of symbols used on the early Christian churches. They reported an extensive list of familiar symbols, the meanings of which were essential to the interpretation of the design. A few of these Christian symbols are:

Symbol	*Meaning*
The ship or ark	The Christian Church
The cross	Christianity
The triangle, three interlaced circles or three fishes	The Trinity
The lily	Purity

Symbol	*Meaning*
The anchor	Hope
The dove	The Holy Spirit; peace
An angel	St. Matthew
The lion	St. Jerome, St. Bartholomew
The ox	St. Luke
The eagle	St. John
The sword	St. Paul
Keys	St. Peter
The violet	Immortality
The butterfly	Resurrection
The daisy	Innocence
The owl	Wisdom
The ant	Industry

In addition a list of symbols used in ancient temples and buildings was compiled. Some of these symbols and their meanings are:

Symbol	*Meaning*
An owl (Greek)	Minerva
A peacock (Greek)	Juno
A caduceus (Roman)	Mercury
A club (Greek)	Herculean strength
An obelisk (Egyptian)	The rays of the sun
The crow (Japanese)	Ill omen
The feather (Egyptian)	Truth
Eagle (Egyptian)	Power
Eagle (Greek)	Spiritual energy
Phœnix (Egyptian)	Resurrection
The fan (Chinese)	Power

While searching out the meanings of symbols the children found that certain authors and painters each used a symbolic device as their signature. This inspired the

children to devise an original symbol characteristic of their own interests and ambitions.

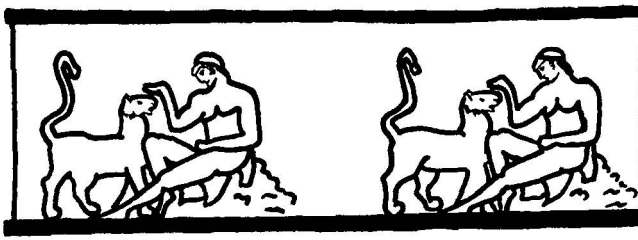
First they listed the emblems or signs which they wished to include in their symbols. Later they were given large sheets of drawing paper on which they sketched the design. This sketch was criticized by the pupils who also made suggestions for improving the sketch. One difficulty with which the children struggled was the artistic design needed to connect the many attributes which they wished to include in their symbols. The art teacher pointed out to them that first they must choose a form or pattern into which the symbols would fit. After this was done they faced the task of placing and arranging their devices so that the finished symbol would convey the meaning intended.

One of the boys used the triangle enclosed in a circle as his pattern because both symbols typified strength. In the center of the triangle he placed his initials. In one corner he set a lamp typical of learning, in another the wreath of success, and in the third corner the T-square symbolic of fair dealing. He interpreted this to mean that his physical strength and his interest in books would bring him success. Another child used a fish enclosed in a circle of waves. This symbolized her great interest in swimming.

Each child was given help in designing a symbol which, in his mind, represented *him*. Some symbols were very elaborate and complex; others were simple and easily interpreted. Later, the less detailed ones were frequently used instead of the child's name. They were used on his written work and especially on art and clay models.

Among other symbols devised and interpreted by individual children were the following:

Description of Symbol	*Interpretation of Symbol*
A series of waves washing over a mermaid.	"To me these waves mean nature and an activity which I love."
An intricate drawing of a Chinese character. (This child had lived in China.)	"This Chinese character stands for happiness and joy."
An inverted triangle.	"Equal in strength, health and industry."
A weathervane with a monogram on the flag.	"The old weathervane is influenced by and turns with each wind."



Chapter IV (*continued*)

ACTIVITIES WITHIN THE UNIT

THE work next to be described is the result of an effort to utilize a branch of Industrial Arts work that would be closely related to this unit of work, and that would also help in the appreciation and understanding of some phase of the pupils' environment. School work is too often dry and meaningless because it is too far removed from the experience of pupils. Younger children particularly, are interested in the things they see about them. If these things are worth while, nothing will do more to arouse their interest and to stimulate their personal effort than finding out about them.

A part of the history work included in the unit of study was the Greek, Roman, and Medieval periods. The architecture of modern times, particularly that of the larger cities, has received from these periods almost unbelievable contributions, many of which are unrecognized and unappreciated except by architects, students of art, and a few laymen. Scarcely a public or private building can

be found that does not have structural or ornamental features traceable to the work of the Greek, Roman, or Gothic builders. The class showed great interest in such features and enjoyed thoroughly their observations of them. Other values of even greater worth, however, grew out of the study.

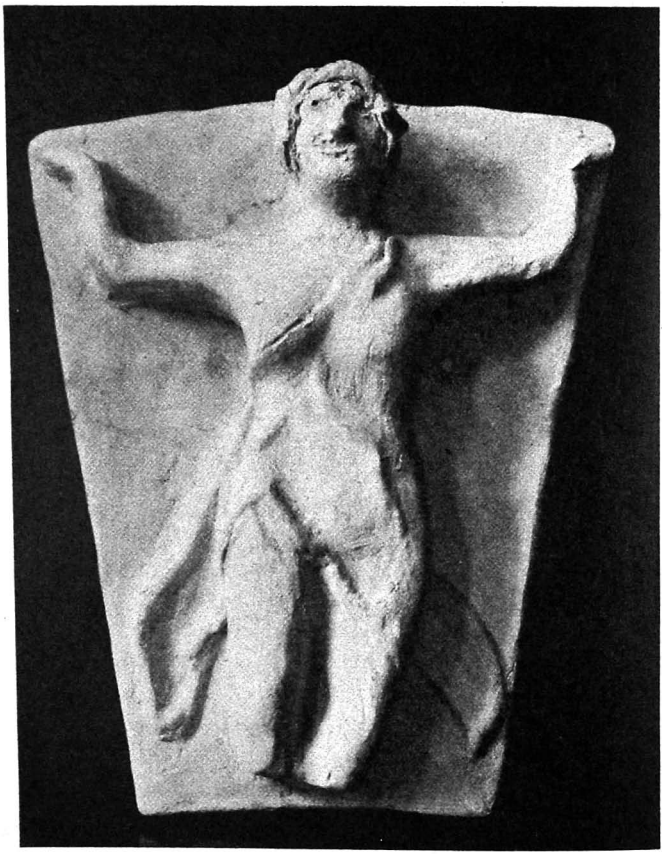
This particular phase of the work began by making a summary of the kinds of houses used by man from the very beginning of history. Emphasis was laid, not on the actual building of these homes, but on their relation to the people and to their occupations and environment. Following this, a more detailed study of Greek buildings was taken up. The Parthenon, as a pure type of Greek architecture, received especial attention. All the pupils had previously seen the model of this building in the Metropolitan Museum of Art but, after a discussion of the three orders of architecture and the characteristic details of each, another visit to the museum was made. Much enthusiasm was shown in pointing out examples of such detail as previous discussion had made somewhat familiar to the pupils and for which they knew the names.

When it was suggested that the class might make and cast some ornaments resembling the examples seen in the museum, they were eager to begin. Clay and plaster of Paris were chosen as the best media for use. The children were told that three principal operations are necessary in making a cast, viz.: (1) The modeling of the desired form in clay; (2) the making of a plaster mold from the clay model; and (3) the making of the cast from the mold. From a collection of pictures secured from the library, and from books each pupil decided upon a type

of historic ornament he wished to make. A full-sized design was then drawn on paper. With this as a basis the modeling in clay began. The aim was to make the ornament as true to the historic type as possible. Examples found in buildings, drawings, and photographs were constantly referred to during the modeling lessons. Running borders such as the egg and dart, the bead and reel, and the guilloche were favorites with the majority of the pupils; some, however, chose antefixes or the anthemion, while one boy insisted upon making a complete Corinthian capital.

Each pupil modeled and kept his work on a small board measuring about $6'' \times 10'' \times \frac{7}{8}''$. While fingers were the principal modeling tools used, the pupils were free to make use of any mechanical devices suggested to them by the character of their own work. Pencils, rulers, compasses, coins and other articles were at times found useful in obtaining some desired shape. This part of the work required several lessons. As there was no provision in the classroom for keeping clay moist the work was done in the modeling room which was equipped for carrying on such work. If this room had not been available, the children might have used a zinc pan into which a small amount of water would have been poured. A covering of boards and cloth would make this a receptacle in which the clay could be kept in suitable working condition.

When modeling was completed, the second step, the making of the plaster mold from the clay models, was begun. Two different types of containers were used to retain the liquid while it was setting. One of these was

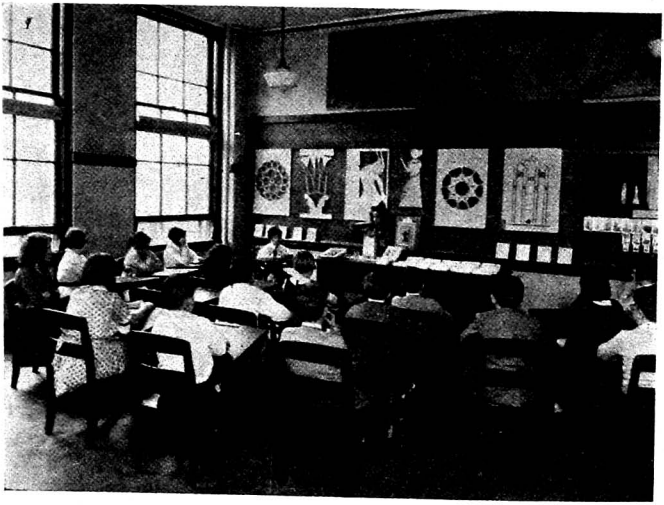


OUTSTANDING EXAMPLE OF PLASTER CAST OF A KEYSTONE MADE BY ONE OF THE CHILDREN WHO IS PARTICULARLY ARTISTIC.

built of heavy pasteboard; the other was an ordinary cardboard box. The walls of the pasteboard container were made from strips of cardboard cut wide enough to extend about two inches above the highest points in the modeling. These strips were then bent inward so as to form close-fitting sides around the clay. Two strips each extending a little more than half way around the clay model, providing for double thickness at the corners, were found to be more easily managed by the children than one long piece. A piece of string was used to tie these walls around the clay. Small wedges made of rolls of paper or pieces of wood were sometimes placed between the strings and the outside of the cardboard to keep the walls pressed close against the clay. In some cases, a thin vertical slice of clay was cut from each edge of the model to secure more vertical edges and square corners against which the walls of the model were to be fitted. In the second instance, heavy cardboard boxes of the desired shape were used. These, also, were secured by heavy twine wrapped around the box. The clay model was placed on the center of the box or form.

The pupils then mixed and poured their own plaster, preparing enough for several molds at one time. By this means little plaster was lost by setting before it had been poured. A wedge was put in one end of the box to allow space for forcing out the model in case it stuck. After about twenty minutes the plaster was hard enough so that the walls could be removed and the clay pulled from the bottom, leaving the completed mold of plaster. One group of children removed the clay pattern by forcing it from the mold. A blunt instrument was inserted in the

channel left by the wedge. Usually this loosened the clay form so that it was easily lifted from the mold. If, however, it stuck or did not come out easily the instrument was lightly tapped with some firm tool. This tapping



A CHILD ILLUSTRATING ONE WAY BY WHICH A MODEL MAY BE LOOSENED FROM A MOLD. IN THE PICTURE ARE ALSO SEEN PLASTER CASTS, CUT-OUTS FOR THE SHADOWGRAPH ASSEMBLY (DESCRIBED LATER) AND A TIME LINE OF THE HISTORY OF ARCHITECTURE.

loosened the clay pattern and then it was easily removed. On this page there is a picture showing one of the girls engaged in carrying out these directions. She is using a cardboard roll and putty knife to remove the clay form.

The fact that the mold is, in form, the reverse of the

clay model was a cause of surprise to many of the pupils although the reason was at once understood.

In the succeeding lessons the third main step, that of making casts from molds, employed techniques almost identical with those employed in making the molds. Walls or boxes of cardboard were placed around the plaster molds. In some instances, the strips of cardboard that had been previously used around the clay were found satisfactory. Before pouring the plaster the pupils were shown how to make and insert hangers of cord or wire so that their ends would be imbedded in the setting plaster. The danger of the wet plaster sticking in the mold and to the pasteboard walls was avoided by brushing these surfaces either with a mixture of soap and water or greasing the mold with ordinary cold cream. Before being used, molds that were very dry were immersed in clean water until saturated. The removal of the plaster casts from the molds completed the work for most of the class. One group wished to apply some kind of surface finish to their pieces. For this purpose linseed oil, paraffin, white shellac, or paints were used according to the particular finish and surface desired.

Several children later brought from their homes articles which they duplicated in plaster. One group, whose work was among the first to be finished, prepared "slip," or a liquid form of clay and water, and showed how dishes may be made by the casting method. For the purpose one-, two-, and three-piece molds were used. Several of the members of this group had had some experience in building pottery by hand and many understood the use of the potter's wheel. Thus a foundation was laid for

the understanding of processes seen later in a visit to a porcelain works.[1] This visit, coming shortly after the work with the plaster had been completed, proved to be a most valuable one because the pupils had had actual manipulative experiences with both plaster and clay and were, therefore, well prepared to understand the processes and the mechanical devices which they saw in use.

A part of several class periods was given to hearing further reports about the processes used and observed. These reports were usually prepared by consulting books in the library and at home. Instead of formal assignment by the teacher the class was asked to suggest topics in relation to plaster that they wished to know more about. After this was done two or three volunteers were chosen to report on each topic. Such questions as the following were discussed: What is plaster? What countries produce it? How is it obtained? How is it prepared for use? What are its principal uses?

Aside from the regular classroom work there were many interesting voluntary responses. It was a common occurrence for pupils of this class to say, "I have seen this or that kind of ornament or structural feature," and refer to buildings along the street or to their homes. One boy speaking to a guest said, "I have looked all over this house to see if I could find any egg and dart molding." A girl reported that she had seen so many examples of Greek border that she thought she would make a list of the places where she had found it, for "there must be miles of it." A boy, after the close of school, wrote: "I

[1] This excursion was not taken during the progress of the unit; therefore it is not described in Chapter V.

have found Tudor roses, some crockets and finials in the billiard room—" (and then drawing another detail for which he did not have a name, he added) "and an ornament that looks like this." The kind of intimate knowledge and interest in architecture revealed in these remarks would have been lost without the approach through concrete experience. The history content stimulated this work and, in turn, gained new significance as its contribution was revealed in modern life.

The work described was completed within a period of a few weeks, there being approximately two one-hour periods each week. In addition to the outcomes already indicated the ground was prepared in a stimulating way for the more intensive study of architecture which followed.

While the children were discussing Gothic architecture their interest centered for a time upon ornamental windows—the rose, St. Catherine's, and wheel windows. Many in the class had visited famous cathedrals abroad and had seen beautiful examples of these windows. They had been impressed by the delicate traceries and resplendent coloring in most of them.

The pupils concentrated their efforts upon a study of these windows. The following questions served as the outline for this study:

Is "rose window" a general term for all windows of such shape and design?
Were these windows in Italian, French, and English Gothic cathedrals identical?
What were the uses for such windows?
What are traceries?

How was the glass held in place?
Was the glass painted or "stained" after it was in place or was colored glass used to make up the designs?
What are the uses of the lead lines seen on these windows?
Who was responsible for designing these windows?
Why are rose windows considered so beautiful?
How was the glass stained or colored?
How long did it take to make a rose window?
What is a wheel window?
What kind of glass was used for these windows?

The Industrial Arts teacher happened to come into the room one morning while these discussions were in progress. She listened to the reports and queries of the children. One of the girls expressed a wish that they had a rose or stained-glass [1] window in the classroom. The Industrial Arts teacher acting upon this wish suggested that the class could make their own rose window if they really wished to do so. The activity had seemed to be too involved and too difficult for them to undertake. The teacher assured them, however, that concentrated effort, careful handling, and accurate work would minimize the labor and produce a creditable outcome. She outlined sketchily the steps involved in making this window and explained necessary details while she attempted to answer the children's questions.

The considerations of techniques did not bother the class at all. The children's chief concern was about materials and cost. The teacher, however, assured them that the materials could be acquired with little expense if

[1] It is recognized that authorities disagree on the application of the term "stained glass." The authors, however, use the words in their popular sense, i. e., a mosaic made of colored glass.

they really wished to carry out a plan of work. The classroom teacher was enthusiastic about initiating the activity, but she was somewhat skeptical of their ability to make such a window. However, she fell in line with the suggestions of the class and did her part to make this activity profitable.

The classroom teacher contributed her share by providing the intellectual background needed before the activity could be begun. Several discussion periods were devoted to answering questions and to studying details of rose windows. One point stressed showed how patient and persevering these artists were and how they devoted years of their time to perfecting just one window. The need for coöperation was emphasized, for each window represented the energy, the craftsmanship, and the artistry of a group of workers.

In addition to this prefatory study the children found sketches of rose windows. They discovered the principle on which they were built, and how each segment of the design was constructed to fit into the circular frame.

When the Industrial Arts teacher was ready to begin, she came to the classroom to formulate a plan of work. Here she met with a new development, for each child wanted to make his own individual window. Aside from the fact that a sufficient quantity of material to make so many windows had not been ordered, there arose the problem of manipulation if the glass on hand were divided and each child attempted to make an individual window. The pieces of glass used would have been so small that the children could neither have cut them accurately with the tools they were to use nor fit them together in so small

a frame. Their plan was both impracticable and too tedious for them to carry out.

At this point the classroom teacher reminded the children of the conditions under which the original Gothic windows had been made. They recalled the necessity for group effort and the ideals of the artists. The teacher pointed out that selfish purposes might have spoiled most of the beautiful rose windows which the class had admired so much. They then saw that their own individual purposes would have to be discarded and that they would have to practice the ideals of these early artists. At first there was keen disappointment, but it gradually subsided when it was understood that their rose window would be used and enjoyed in their own classroom. Before the plan proceeded further they had to be reassured that they were acting in accord with the plans of the early Gothic artists.

The first part of the plan called for a selection of design. Each child made a sketch for the window. These were not altogether successful for the children had not fully grasped the idea of the uniformity of design in each of the segments. Many of the sketches were too detailed and minute for practical purposes. Almost an entire period was given over to a discussion of geometric figures and ways of fitting these angular forms into a circular frame. Many of the designs were drawn on the blackboard and the children experimented with a design for one segment of the various forms. Before the period had closed the class chose the octagon as the geometric figure with which they preferred to work.

During a subsequent period the classroom teacher

further developed the principles of figure construction. This was a difficult step for the class to comprehend, but the necessity for being familiar with the chosen form impelled the class to acquire at least a working knowledge of the principles involved. There was no effort made for complete mastery of details; the only aim was to make sure that the children had a working familiarity with the forms to be used in this activity. Many geometric terms were introduced and made meaningful through this discussion.

Before the Industrial Arts teacher met the class again the children had made individual designs from which the class design was to be chosen. In making this selection the class was urged to consider these standards:

1. Simplicity of design
2. Adaptability to the materials and tools used
3. Possibilities for coöperative work

Four of the best designs were selected by elimination and from these designs the best sketch was chosen. After the final selection had been made each child sketched one segment of the design and colored it according to his own idea of the most effective treatment of the design. From these last sketches a working drawing was made which was to be used in each of the segments. The coloring chosen by the designer was also an important factor influencing this final vote.

The first step in the constructional activity was making the enlarged paper pattern for the actual size of the window. This was needed before the working design could be made or the glass could be ordered. Exact dimensions were given to three groups of children who each made a

paper pattern. About the time the patterns were completed the Industrial Arts teacher, who had been commissioned by the school to buy whatever materials were required, received from the Tiffany Studios the glass needed for this activity. It was in small pieces and irregular in size—scraps left from some of the commercial orders made in the studio. These small pieces were given to her without any payment. This unusual privilege is not possible to every school but that need not deter those so inclined from making a similar window. Colored glass brought from home, such as bits of broken glass ornaments or broken bottles, may as effectively serve this purpose. Both have been employed successfully by other groups in other schools.

In addition to the glass the children employed glass-cutters, pieces of lead, a soldering iron, a quantity of wire solder, and a quantity of solid sal ammoniac to be used as a flux for the solder. Later a file was also used.

The children were now ready to begin work with the glass. A colored paper pattern was fastened to a cork board which was to serve as a base for the window until it was completed. Another paper pattern of the window was cut up into the constituent parts of the design and each part was pasted over a piece of glass corresponding in color to the original design.

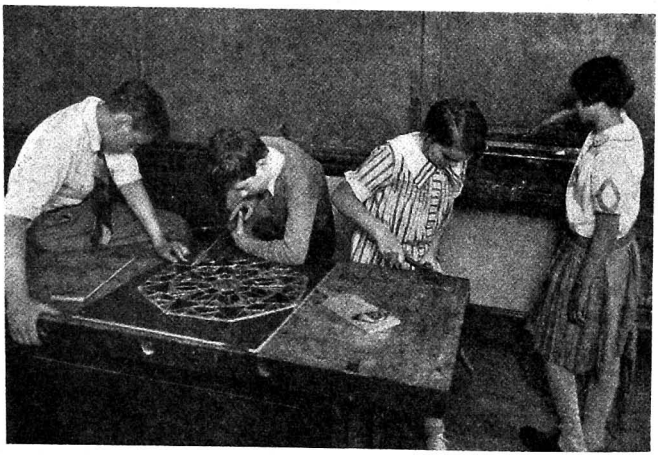
The class was divided into small working groups. Each group was held responsible for the cutting, arranging, and leading of one segment of the window. In cutting the glass, the children used a glass-cutter of the commercial variety and a ruler. They first dipped the cutter into a cup of oil; then they held a metal-edged ruler parallel

with the edge of the paper pattern. The ruler not only held the glass firmly on the table but it also served to direct the line along which the glass was to be cut. The children were instructed to make one long stroke of the cutter to scratch the glass. If this scratch was not deep enough the strokes were to be repeated until the glass was deeply scored. The tendency of children is to make many short zigzag strokes, but this method of glass-cutting produces rough and irregular edges. Long and continuous strokes make scorings that are easier to break.

When the surface of the glass had been sufficiently scratched the children were ready to break off the pieces. When a large piece was being cut, it was broken off easily by hand along the line of the cut. However, when the pieces were quite small they were too difficult to handle in this way. Pliers proved simple and effective tools for this work. When the edges were rough or irregular they were evened up by using pliers to snip off these edges. This process is known as "chewing" off the glass. The term had great appeal to children for a process becomes proportionately more important when it is known by such a lowly name.

When all the pieces of glass had been cut and laid in place on the paper pattern the children were ready to solder. The leads were cut to fit the edges of all adjoining pieces of glass in the section. A skeleton lead frame was then made for the section. The lead was held in place for soldering by fastening or tacking it down on a board to hold the joints in place. This frame was soldered at each joint. For soldering, a commercial soldering iron was used. It was brought to a high degree of heat over a gas

jet. Then the point of the iron was stuck into the solid sal ammoniac. This burned a hole in the substance. In this hole was placed a small quantity of wire solder. The heated soldering iron was applied to it and the solder was changed in form from a solid substance to a bead of liquid-like consistency which clung to the point of the iron. The



THE ROSE WINDOW NEARS COMPLETION AS THE LAST GROUP OF CHILDREN SOLDER THEIR SEGMENT INTO PLACE.

lead at the joint of the frame was scraped until it was bright and clean, for solder will not stick if the surface is dirty or oily. The point of the soldering iron was then applied to the joint and with a light motion the worker pulled it towards him. The motion produced an even surface and a neat weld. Care had to be taken during this process to see that the iron was not too hot for in

that case it would have melted the lead and caused it to lose shape.

Before the soldering was quite completed the Industrial Arts teacher had heard of a newer and more simple method of doing this work. She took one class period to explain and illustrate the differences between the newer method of soldering and the older method which had been used by the class up to this time. The improved method was not only less complicated but did away with the use of the sal ammoniac as a flux. The wire solder was melted in a small pan secured on a wooden paddle. The soldering iron was filed to a clean surface before it was inserted in the flame. It was then applied to the solder which, when melted, adhered to the iron. The joint to be soldered had been rubbed with an ordinary tallow candle which contained oleic acid. This acted as a flux when the melted solder was applied to the lead. The Industrial Arts teacher explained to the children the chemical reactions that took place in each of the processes. She then demonstrated the newer method before she gave the work over to the class. Several of the children tried the new process before the soldering of the window was completed.

The glass was then fitted into the skeleton frame and, as each section was finished, it was leaded around. After all the sections were finished they were leaded together and the window was fitted into a wooden frame, ready to be hung.

The process sounds rather complex and involved, but in reality it is much simpler than a description might indicate. One of the girls who was keenly interested in

the activity thought that a description of the work involved would make an interesting contribution to *Lincoln Lore,* the school publication. Consequently, she wrote the following item to submit to the editorial staff. It is included here to show her reaction to the activity.

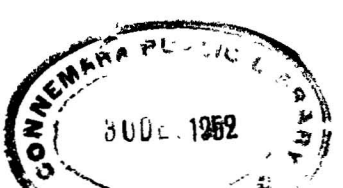
The History of Our Rose Window

Our class wanted to show certain architectural details. We talked about making them in leather. Some one suggested making a Rose Window. Then came the discussion whether we should each make a window of our own or make one big one for the class. There was quite a discussion! After all it was selfish of us to want to make individual rose windows. It was not in keeping with the true spirit of Gothic Architecture, because in the Middle Ages the cathedral builders built their churches and buildings coöperatively, each one doing his share in the making of the building. That's what really counted.

Another reason that we each could not make our own windows was that a reasonably sized Rose Window would require such a great quantity of glass. This would have to be cut in very tiny pieces in order to fit into the frame of the window. These pieces would be too small for us to handle.

Rose Windows are very graceful and delicate. They have curved lines and these we could not cut when we designed our Rose Window. We did not have the necessary tools or the skill to make the curved lines. We had ordinary glass cutters which could not cut curves. Therefore, we decided to cooperate together and make one large Rose Window which we could hang in our classroom.

The first thing we did in the making of our Rose Window was to make the design. These designs were put on the bulletin board and the best one was selected. We made a tracing of the design and divided it into the outlined parts. We took these pieces of paper and pasted them on the sheets of colored



glass. Then we cut the glass. We had a lot of fun "chewing" it. Now don't get excited because chewing glass does not mean what you think it does. It only means straightening and evening off the rough edges. After cutting the glass we soldered it together.

This is the history of our Rose Window briefly told. We worked patiently and carefully all through these long processes.

In connection with the soldering processes, the children were keen to acquire information about the material used. The questions which they asked were of such a technical nature that the discussions of these inquiries took place in the shop under the direction of the Industrial Arts teacher. There equipment was available with which she could demonstrate processes and show reactions taking place. The children found the reason for certain changes and had access to materials that would help them to understand basic principles underlying these soldering processes.

Among the questions asked were:

What is lead?
What happens to lead in the soldering process?
What is sal ammoniac? Where is it found? How does it act?
What is copper?
What is flux?
At what heat do the different metals melt?

To answer these and similar questions the children had further research study. They learned a little of fundamental chemistry during the demonstrations and discussions. These principles were presented in the simplest forms, so that the children were not confused by technical terms and formulæ.

Up to this time the children had expected to have their rose window in the sixth grade classroom, but one day one of the children said that she thought the window should be presented to the school. Another child objected to this suggestion stating that in such case it would probably be hung in some room to which the children did not have access. Meeting the objection, another child expressed his wish that the window might be hung in the library. This suggestion seemed to meet with general approval, but before deciding definitely about the disposal of the window, the children asked the teacher for her suggestions. Her ideas were not at all in accord with any of the proposed plans. She thought that the window should be presented to the Parent-Teacher Association to be hung in the room reserved for their meetings and conferences. There was little discussion following this suggestion, for the children agreed to it almost unanimously.

With the acceptance of the idea the class began to plan for the presentation of their gift. A presentation tag was made, inscribed and attached to the window. Because the school year was so nearly ended, the children decided to defer the presentation ceremony until the beginning of the following school year. In the meantime they hung the window in one of the corridor exhibit cases so that school visitors and summer school students might enjoy it. In another case they set up a complete display of the steps involved in the making of a rose window showing each successive step from original sketches or designs to the finished product. Accompanying this display was a detailed outline of the work which contributed to this

activity. With this outline there was also a description of the methods used and some of the intellectual preparation given to the children as the work progressed.

The rose window activity was one of the most interesting and satisfying enterprises undertaken by the class. It presented new problems, new materials, and new content. The processes were quite unfamiliar to all the children. This added new interest to the activity, for no child had had previous experience with these media of expression. Even though the children devoted a great deal of time to the work, their interest seemed never to have lagged. They were all pleased and satisfied with the finished window and voted the work the most interesting activity they had ever undertaken.

The instances of genuinely child-initiated activity are much too rare in upper elementary classrooms. The curriculum demands, the intensity of study activities, and the influence of adult discipline often direct such efforts to a minimum practice. Childish interests then find their chief expression through athletic or competitive activities. Too often, the child fears criticism or censure if he proposes enterprises below the adolescent level of interests.

In this class, there was a group of children with marked pre-adolescent interests. They were the "followers" in the activities and proposals suggested by the more experienced groups. Their mental abilities were respected and sought by all the children; but their plans for group activities were often too juvenile or too "babyish" for the class to accept.

However, for them came the opportunity to initiate

unostentatiously an activity that proved to be one of the most interesting undertakings of the class.

All the children had been collecting pictures and illustrations for their notebooks. On his way to school one of the boys passed a second-hand book shop. In the window he saw displayed a number of old magazines. Thinking that he might find additional material in them, he stopped to browse around the shop. To his delight he found several copies of *The Architectural Record*. These were selling for five cents each. He bought four copies, each of which contained numerous illustrations of prominent buildings typical of different styles of architecture and brought them to the classroom.

When the children saw these magazines they all wanted to buy copies of them. However, Louis had his own ideas about utilizing his information. He would not tell the class where he had bought these treasures. Several of the children asked him to buy magazines for them if he was not willing to tell them where they could buy them themselves.

Louis recognized in these requests sufficient demand to originate a selling scheme. Instead of purchasing magazines to fill the class orders, he proposed that he sell his classmates any pictures selected from his magazines. At first he conferred with the class telling them that they might select their pictures at any time during the day. The prices varied. The full page illustrations were more expensive; the smaller ones were proportionately lower in price.

The first day's sale was quite profitable, but during the succeeding days the demands were not so great. In the

meantime Louis had bought additional copies of the magazines, so this falling off in trade threatened his capital.

Two of the girls who had had selling experience during their vacations, recognized in this venture a scheme for profit if it were handled in a more systemized way. Louis had asked one of them to buy some of the pictures. She replied, "No, they are torn by handling and they are worthless. If you want to sell them, though, Helen and I will help you so that you can sell them at a bargain price and still not lose any money." This marked the beginning of an activity that was helpful to the entire class.

The three children cut and mounted the pictures, and arranged them in piles on a table in the front of the classroom. Each pile of pictures had the price mark conspicuously displayed. The prices ranged from one cent a package to five cents for colored full page illustrations. Business was revived and the demands increased. Soon the improvised shop was not large enough to supply the needs of its patrons.

In the back of the room was a structure used in former years as the school bank. This was not in use at the time, so the three children secured the teacher's permission to utilize it for their shop. They made use of the files to classify their pictures. Each shelf was labeled to correspond to the periods of architecture of which they had pictures. The two girls supplemented the stock by contributing a share of new pictures from their personal supplies. The expenditure of money to date was thirty-five cents which Louis had taken from his weekly allowance. His previous sales totaled only fourteen cents,

so he figured that his loss was too great to permit of further expenditure of money.

When the new shop was ready the children at first sold only those pictures from Louis' original purchase. Within a short time the supply had been exhausted and the records showed a profit of fifteen cents beyond the capital invested. New pictures then were added to the stock and regular selling periods were set. The children printed signs or advertisements telling of the sales or "bargains" set for the given day. The most beautiful illustrations were exhibited to inspire buying activities.

In the meantime, the children had bought from a nearby agency three large sheets of pictures of cathedrals, temples, and other architectural structures. These sheets cost ten cents apiece; to buy them, each child of the "corporation" contributed ten cents from his weekly allowance fund. They cut the pictures separately and sold them for three cents apiece. As one of the children explained "that was spending little money, but getting a lot."

Business thrived again with the addition of the new stock. The pressure was so great that each of the three children was assigned to different posts. They worked together to cut, mount, and classify the pictures. Louis and Helen were salesmen. Barbara was the cashier. She brought a cash box to school in which she deposited the money collected. She made daily records of their sales and their financial standing. All the money was handled by this cashier. The salesmen made out slips for the purchasers who, in turn, paid the amount of their bill to the cashier.

Several children frequently wished to make purchases when they had no money with which to buy the pictures. For their convenience a credit system was established. The details of this were also handled by the cashier. She made carbon sales slips; the shop retained the original

THE OFFICE OF THE "CORPORATION" WHICH SUPPLIED THE CLASS WITH PICTURES OF ARCHITECTURAL SUBJECTS. THE "OFFICERS" ARE ENGAGED IN THE WORK OF THEIR SEPARATE DEPARTMENTS.

slip and the purchaser received the carbon copy. Two days before the end of each month these accounts were due. As each credit customer paid his bill the cashier receipted the slips and gave the purchaser his receipt.

When the stock was not selling well there was a "phenomenal sale" announced, or perhaps an auction took place. At these times great bargains could be secured;

five-cent pictures were frequently sold or auctioned off for as little as two cents. These emergency measures were introduced primarily to dispose of handled or imperfect wares.

Regular weekly business meetings were held by the three children to discuss plans for the following week. The cashier was the secretary of these meetings and made minutes of the proposals. At these times financial reports were also made showing the amount of money represented by the stock on hand as well as the sales record for the preceding week and the "corporation's" profit or loss.

The final records for the activity show that during the term of this business venture, the stock investment was ninety cents; the profits totaled two dollars and thirty cents. The most expensive picture, a large colored reproduction of Rheims Cathedral, sold for twenty cents; the greatest bargain was a packet of ten miscellaneous subjects which sold for one cent. The average price for each picture was about three cents. The proceeds from this enterprise were added to the class treasury from which a new book was purchased for the classroom library.

The values derived from this activity are obvious. If one were to list the learnings acquired through this activity the result would be astounding. Both merchant and purchaser had valuable experiences which seldom occur in the life of an eleven-year-old child. Buying was the least of them, for this necessitated so many other experiences that the trading became almost insignificant by comparison. The enterprise was organized on sound

business principles which brought a maximum of satisfaction and encouragement to everyone concerned. Outstanding among these principles of everyday trading were such practices as the fair price of commodities, the right conception of values, and discrimination between *cheap* merchandise and that which is sold at an equable price. All the children had invaluable practice in contributing to the success of the undertaking. It was a real and natural activity, duplicating (but not pantomiming) a real life situation.

While most of the written work prepared in connection with this unit was of a factual and descriptive nature, the children found much inspiration also for original creative expression. Some of the old legends which they read stimulated them to write their own versions of these tales.

One of the children paraphrased and illustrated by means of sketches the legend of the origin of the acanthus leaf decoration which identifies the Corinthian capital. Her story follows:

THE LEGEND OF THE CORINTHIAN CAPITAL

After the death of a young girl of Corinth her nurse gathered together all of her favorite toys and trinkets. She put them into a basket, which she carried to the child's grave. She thought that these toys would be a comfort to the girl. She placed the basket on the grave and covered it with a heavy slab of tile to keep it from being blown away. As it happened, the basket was placed on the root of a thistle plant, which in Greece was called an *acanthus*.

When spring came, the young acanthus leaves shot up from their roots and partly encircled the basket. The weight of the heavy tile prevented them from covering it completely,

so the leaves turned and twisted gracefully around the curves and angles of the tile.

While the leaves were still fresh and green, a famous Greek sculptor happened to pass by the grave. He was thrilled by the grace and beauty of the sight.

"That," he thought to himself, "would make a beautiful decoration for a capital. The leaves curl so delicately and gracefully around the tile; surely they would be fitting to use as a decoration or a molding."

He hurried home to experiment with this design and to fit it into some of the capitals he was carving.

Soon a new capital was introduced into Corinthian architecture. It was beautifully decorated with curling, drooping acanthus leaves.

Many familiar legends from Greek and Roman lore were similarly paraphrased. The authors of these paraphrased tales were encouraged by their classmates to add to the collection of myths and legends being compiled through their efforts. A kind of competition was established by this activity for the entire class searched avidly through many books to find legends bearing on the origins of architectural details. These tales were usually adapted before they were read to the class. Mimeographed copies of the stories written by the children were distributed to those who wished to include them in their notebooks.

Another legend of a different nature was paraphrased by one of the boys. It told about the building of the famous Byzantine Church of St. Sophia.

The Building of St. Sophia

The emperor Justinian set out to build a magnificent temple to the God whom he worshiped. He said, "I shall build a

temple that will surpass in magnificence all of the temples that have ever been built. Its interior will dazzle the beholders. Cherubs and seraphs in colored stone will encircle the King of Kings. On either side will range the twelve Apostles. Looking down on this magnificence the Savior in regal splendor will survey the world. Jewels and gold and precious metals will adorn his robes. This great gift I shall give to the Savior. None shall share with me the cost nor the labor; none save Justinian shall claim the honor. I shall carve my name above the portal as the sole giver of this temple."

He sent for the greatest artist of the world and told him about the plans for the building. He instructed him to build the greatest temple of all time. He was to spare no expense, no labor, no costly materials.

"And above the portal," he said, "carve this inscription: 'This House of God, Justinian, the Emperor, gave.' "

The artist hired workmen and for seven years they worked at their task. At last it is finished, this temple, the most costly, the richest, and the most magnificent that the world had known.

People came from near and far to view the temple. The emperor approached the building and marvelled at its great beauty. Eagerly he sought the legend inscribed over the portal. He read, "This house to God, Euphrasia, the widow, gave."

When Justinian read this, he raged and raged. He sought the sculptor. Pointing to the inscription, he asked, "What does this mean? Why were not my commands obeyed? You will pay dearly for this jest."

The sculptor threw himself upon the emperor's mercy explaining that he knew nothing of this change. He had carved the name of Justinian in the stone.

An old man told the emperor that the artist had spoken truthfully, for he himself had read the inscription after the artist had finished his work.

"Perhaps another and a mightier hand has done this, O King," exclaimed the old man.

But the king would not believe either the sculptor or the old man.

"Who is this woman—this Euphrasia?" he asked. "Bring her before me."

But no one knew her.

"There is an old woman of that name who lives by the quay," explained one of the throng, "but she is feeble and poor. She could have had nothing to do with this deed."

But the emperor demanded that she should be found.

A messenger went to the quay to find her. After many hours he returned. A feeble, poorly clad, and old woman tottered along behind him.

The emperor approached her.

"Euphrasia," he cried, "why have you disobeyed my commands. What have you given to the building of this, the emperor's temple?"

The old woman explained that she had done nothing to disobey the king's law.

"I only gave a little straw to the oxen that drew the heavy marble for the temple," she said. "I had been ill and alone in my hut for months. I saw no one. One day a bird came to my window and sang for me. His was the sweetest song I'd ever heard. I thought that the Lord had sent this tiny messenger to comfort me. I wished to thank Him in some way for His gift. Just then the oxen went by. I pulled a few wisps of straw from my mattress and gave it to them."

Justinian was shamed by the noble sacrifice of this feeble, old woman. He now understood why his gift had been rejected by God, who had so willingly accepted the noble sacrifice of the widow.

The motive for writing factual data was supplied by the necessity for preparing notebook contents, for presenting both oral and written reports about special interests, and for participating in the class assembly program. Some of these written reports deserve especial mention, for

the children tried to give a brief though intelligent account of the ideals and trends which influenced the change in architecture. Two of these accounts varying widely in treatment, show the success of the undertaking:

RENAISSANCE ARCHITECTURE

In the fifteenth century A.D. there came a new style of architecture called Renaissance or rebirth, which gradually displaced the Gothic. This was a very good name for it, because it really was a rebirth or revival of the classical architectures, Greek and Roman.

Raphael, Michelangelo, and Leonardo da Vinci showed through their paintings that a new influence was being felt in the realm of Renaissance art. This influence as shown in the new art was taken from ancient Greece.

The Renaissance period was a period of freedom where a few men's ideas could not be forced to the same extent as formerly. If men followed other men's ideas, it was through appreciation for their works. This spirit of freedom has been growing in the world ever since.

(*Lantern slide of St. Peters, Rome.*)

This is one of the best examples of Renaissance architecture, St. Peters, Rome. Notice the ornate figures that are a main characteristic of Renaissance architecture.

(*Lantern slide of an interior of a Renaissance building.*)

This slide shows you how ornate Renaissance architecture is.

MODERN ARCHITECTURE

Take an architectural tour of some of our American cities and what do you find? Styles of buildings based on every form of design huddled together, crowded into limited space, with no proper outlook or purpose. Business buildings take the shape of Greek temples, Masonic shrines and fraternity houses are built in the likeness of a Pharaoh's tomb, Gothic

cathedrals house moving pictures; and stately Colonial mansions serve the purposes of restaurants, filling stations, or second-hand shops.

America seems to have had no plan in her building activities. Now, however, we are beginning to create a new style that some day will represent America, as the pyramids symbolized Egypt.

Congestion has forced architecture to the skyscraper. Steel and concrete have established the safety and the efficiency of the modern building. Crowded streets and high buildings prevent the tall buildings from receiving their share of sunlight and air. To overcome these serious conditions many cities have now passed certain laws requiring architects to provide for both air and sunlight to reach these buildings. These laws call for set-backs on all tall buildings. They make the buildings look like a pile of boxes placed one upon the other.

Several children attempted to write their reactions to architecture in poetic form. This is probably the most difficult medium through which to express emotional response to so intangible and inclusive a subject. However, some of the children, undaunted by the difficulties of the task, wrote verses in praise of beautiful buildings. Because these abstract ideas are beyond their ability to express adequately, some of these verses are poor. However, they represent another field of activity which was prompted by this unit of work.

Modern Architecture

Roman aqueducts tall and high
Gothic spires toward the sky
Greek the perfect
Rennaisance the severe
All mix into modern, I fear.

Architecture

Architecture means to me
Things that are and used to be
Ancient Greece with all its glory
Like a morning cold and hoary.

Like frost upon the window pane
Thawing with the morning rain
Like a modern building and high
Reaching to the vaulted sky.

Rome who conquered every foe
Its story in its buildings show.
Today a modern architect
Still looks at them with great respect.

We try to copy things of old
Without respect for things foretold,
For, if we did produce another,
It would be but mockery of its brother.

Egypt with its ageless wonders
But reveals our glaring blunders,
Which in spite of ages gone
Still remain to gaze upon.

Today we build a building strong
And pull it down before the dawn.
What's the aim of our architecture?
That we leave to your conjecture.

Caryatids

Caryatids are glorious creatures,
Draped and carved with lovely features.
When they look at me just so,

They tell me tales of long ago,
Tales of houses rich in gold,
Tales of wars in days of old,
When they were new and free from scars,
Shining and glistening like new-born stars.
When death to their fair city came,
They stood there smiling just the same.
Made of marble hard and cold,
They have stood through ages grim and old.

Modern Giants

Oh modern buildings reaching high,
Breaking through clouds in the sky,
Your steps and spires, towers, and domes
Make ancient buildings look like gnomes.

I wonder how you all can be
So tall compared to little me.
When I look down from your great heights,
The people appear as tiny mites.

A Castle

Cold and gray against the sky
Yon castle standeth out.
Bleak! Oh, what's as bleak as thy
Towering walls so high.
Round it waters of the moat
Leap cold and seem to shout,
"Beware, my lord! fly, oh, fly!
Death and danger both are nigh."

The library of Lincoln School contributed in no small way to the activities already described for it was there that much of the search for the specific information necessary to the work of the unit was carried out. But the

facilities of the library did not end with the provisions for research.

Frequently the Librarian came to the classroom to talk to the children about the literature of the peoples who had developed the various types of architecture. She had a broader knowledge of the field of literature and poetry than either the classroom teacher or the children, and therefore was better equipped to direct new interests in reading.

These literature periods were based on the assumption that, for a complete understanding of the lives and activities of peoples, the child should become familiar also with their painting and sculpture, their prose writing and their poetry. These are the veritable expressions of their ideals and their guiding emotions, their beliefs and their practices. Likewise, the accomplishments of the teachers, statesmen, and philosophers are more significant when the children understand the principles for which they strove. A knowledge of certain incidents in the lives of these men helps the children to interpret the civilizations in which they lived.

Several periods were devoted to the retelling and discussion of Greek myths and folk-lore. Most of the class found these familiar friends of whom they never tired. For those children not so well versed in literature the periods were the inspiration for becoming better acquainted with these thrilling tales. Interest in the *Iliad* and *Odyssey* was re-stimulated. For a time, following these discussions, the children read with renewed enthusiasm most of the available books of Greek literature.

Another period was devoted to a discussion of the

biographies of many renowned leaders of old Greece. Homer, Herodotus, and Sappho became real personages. The form of the Greek drama was introduced through the lives of the poets. These plays are too difficult for children to comprehend even in the modern versions, but they can enjoy the humor of some of the situations if the plays are retold in story form. The plays of Aristophanes abound with interest when the playwright's purpose is understood. The tales of Æsop take on new meanings when the children understand the motives for the personifications which characterize these tales.

The legends associated with the work of Sophocles, Socrates, Themistocles, Pericles, and other great leaders are of great value in broadening one's contacts with the growth of civilizations. To be familiar with the history of nations one should also be acquainted with the lives and accomplishments of their outstanding leaders. To appreciate the power and wealth of Egypt one must know about such persons as the Pharaohs, the Ptolemies, Cleopatra, and Julius Cæsar. And how can this acquaintanceship be established more effectively than in relation to a general interest in the civilization of which they are a part?

The program described for stimulating an interest in Greek literature and folk-lore was followed whenever a different nation or civilization was studied. Such were the underlying motives for providing these special periods with the Librarian.

This was not the only provision made to stimulate reading interests. The children enjoyed books. This attitude had already been established in the preceding

grades. The object of the teacher was to direct this interest into as many channels as possible. Many other library periods were provided when the children could choose the books that they preferred to use for their pleasure reading. This choice was not directed by the teacher, but she was nevertheless familiar with the kinds of books chosen by each child for he kept a list of the books that he read during the year, to which the teacher had access. From the list she could determine the trend of his interests in reading. A more detailed account of this activity and typical reading lists are included in Chapter XIII.

These specific instances of activities are indicative of the breadth of experiences gained by the children within this unit of work. The situations in which they took place were social and democratic; opportunities were provided through them for individual growth and advancement; the classroom settings were so arranged as to provoke clear thinking, balanced judgment, and an evaluation of standards of work and citizenship. The group activities were not suggested because they might stimulate study, but rather that they might enrich the abstract materials presented in the development of the unit. Each chosen activity was a significant outgrowth of the study and not incidental to particular topics. It bore direct relationship to similar experiences in the field of architecture, and insofar as was possible, it was identical in process with that used by the adult worker.

Chapter V

EXCURSIONS

OBVIOUSLY in developing such a topic as the story of architecture, the most pertinent illustrative materials for study are the many interesting buildings in any particular city. The children who initiated this unit of work were especially favored with an environment rich in architectural beauties, for New York City is filled both with unusual and significant buildings. However, this opportunity is not peculiar to this locality alone for all children in every part of the world are exposed to some modifications of this environment. Wherever man lives he builds homes, public buildings, and workshops. To such as these, then, teachers everywhere may plan many excursions in order to provide that first hand experience which is so vital in the learning process.

A certain amount of preliminary work is necessary and should always precede a trip or a visit to a point outside the school. The teacher conducting the trip will need to make a preliminary survey in order to locate

those particular things which are to be brought to the attention of the class, to select the safest and quickest route of travel, and to become familiar with important related aspects along the route. A trip to a museum involves an additional step, for the collections usually contain such a wealth of material that, unless the most significant and relevant details are picked out and emphasized, there may be very little educational value in such a trip. Children, with their shifting interests and their susceptibility to distractions, are apt to be drawn away from the topic for consideration during such excursions.

To be profitable, a trip must be so managed that the pupils will have in mind a definite purpose for the excursion. The teacher also will need to have this purpose definitely in mind beforehand and to plan how to secure the most effective and satisfying results. If careful preliminary work is done and if a well-defined purpose and plan is in the mind of each child, then the excursion is more likely to be profitable and effective. If such careful preparations are made beforehand there will scarcely be an urgent need at the museum for the services of a professional guide.

A further preparatory step should include also the opportunity to talk over with the class the things to be observed. Excursions should be an outgrowth of regular class work, but questions and problems arising during these visitations should be anticipated. It is legitimate, therefore, to introduce some special preparatory studies from pictures, books, slides, or other sources before taking such a trip. Pupils' questions, class problems, or

a brief outline of points to be observed may be used to direct the observations of the class. Each pupil should have a copy of these pre-plans to use for reference during the trip. This does not mean formalism for, if handled correctly, this material stimulates each pupil to direct specifically his own observations and discoveries. The time required for taking such a trip may be estimated by the teacher on the preliminary trip so that there will be no waste of time or conflict of schedules.

To be most effective, a trip should terminate as soon as the desired observations have been made. The class should return at once to the school. A follow-up period should be arranged for as soon as convenient after the class returns to the school. During this period an accounting of some kind should be made. By its very nature the discussion often takes form in reports—either written or oral. If it is to be shared with another class or group, undoubtedly this form would be chosen. The children, on the other hand, might choose to make a book or a pamphlet about their trip to be shared with other groups or with schools in another part of the country. This, then, would require the making of complete written reports, each pupil contributing a part in individual compositions and sketches. Opportunity should always be given in discussion for answering questions, for correcting wrong impressions and faulty observations, and for making note of points for future trips and further study.

Very frequently there is no reason for sharing the experiences of the excursion with other groups. If the purpose for a particular visit is study or stimulation

of interest, a review or a résumé of these experiences would seem irrelevant. In such cases class discussion, presentation of sketches made, questions raised or answered, pictorial or illustrative materials displayed and explained—these have meaning primarily to those who have participated in the excursion. To try to share these particular experiences with other groups might not be either profitable or beneficial. The final summing up of an activity or a unit of work will take cognizance of all these excursions and will provide ample opportunity to present the values derived from any excursions taken. From one source or another some teachers have formed the idea that no excursion is justifiable unless there is an immediate provision made for telling some other class about it. Unless this sharing of activity has a great value both to the receiver and to the giver, the artificiality will kill the desire for its legitimate practice. Children often look upon class excursions as imposed tasks because they know that the attendant consequence thereof is a speech in assembly or a written composition for a notebook.

Excursions may be taken profitably at any appropriate time during the progress of a unit of work providing that there are sufficient and legitimate reasons for undertaking such an activity. The teacher must decide beforehand upon the aptness of the time and place of visitation, the purpose for which it is to be taken, and the fitness of the excursion to the daily school program. Some excursions are more suitably taken in the early days of a unit of work. These may serve as stimulating agencies to further the study. The displays or localities

visited for this purpose usually emphasize more obvious features which do not need to be developed fully before the visit is made. Somewhat later in the unit, when topics have been more fully developed, the teacher may plan to visit other points of interest for the purpose of re-stimulating enthusiasm or to give additional and fuller meanings to topics already studied.

Other excursions cannot be made advantageously until the children have acquired the necessary background of information and knowledge to interpret, to understand, or to appreciate the values found in these particular places. When the object of an excursion is to observe detailed and technical processes, for instance, it would be unwise for the children to make these observations without sufficient previous preparation to understand the underlying principles involved in the process. Likewise would it be unwise to make an excursion to a museum without providing the children with some means of interpreting the intrinsic meanings and beauties found in the displays. The teacher, knowing her class better than any one else, must decide for herself the best time for all excursions and must provide enough background to make it both profitable and enjoyable.

In dealing with the theme of the history of world architecture the children required extensive study and preparation before they were ready to take many of the trips recounted in this unit of work. Since this study was primarily based on an appreciative understanding of man's creative work the major portion of the time was spent in acquiring interpretive standards for evaluating

the architectural displays seen in New York City. Excursions were not used in this case as agencies of stimulation, but rather as summarizing agencies which clinched or fixed the information and generalizations gathered through studies made and discussions held before the excursions were taken.

Almost all the children made independently several excursions to points of interest discussed in the classroom. For this reason the number of trips made by the entire class was not so extensive as might have been arranged otherwise. The children brought back from these self-initiated trips items of general interest which stimulated less enthusiastic children to plan similar trips. The teacher talked with several parents new to the city and helped them to plan sight-seeing tours for their children which would bring the greatest value to those not familiar with New York City, and which would feed directly into the unit of work being studied by the class. She also conferred with the children and advised them about worthwhile exhibits which she knew would further their interest in world architecture. Thus the children were encouraged and helped to investigate the many architectural wonders found in the city. She provided opportunities for individual children who otherwise would not have had these experiences by arranging for them to accompany other children or adults who were making trips. Therefore, although the entire class did not make visitations to all the points of interest in the city, each child had adequate opportunity to become acquainted with the outstanding buildings and exhibits enjoyed by the entire class.

On a particular trip to the Metropolitan Museum of Art planned by the class, the children set out to observe and report certain specific data.

The teacher's objectives for this excursion were:

1. To check on the accuracy of the children's knowledge of architectural terms and details acquired through the extensive use of reference materials.
2. To give opportunity for seeing actual examples and models of architectural features discussed in class.
3. To aid in the appreciation of outstanding examples showing the development of architecture through the ages.
4. To re-stimulate interest in the unit.

One of the class-made requirements was to count the number of channels, or flutes, on the shafts of the Doric and Corinthian columns. The fact that the number was found different for each type and that, no matter from what source the example was taken, the number of channels remained true to type, proved to be a matter of great interest. Much enthusiasm was shown in pointing out examples of such details as previous discussion had made somewhat familiar to the pupils and for which they already knew the name.

Previous to this particular excursion the class had made another trip to the same museum for the purpose of observing the many excellent reproductions of famous buildings exhibited there. (See illustration on page 269.) The pre-plan made by the children for this visitation showed evidence of a study outline. Some of the topics included in the plan follow.

I. Study the Parthenon.
   What is its general plan?
   Note pillars—what order?
   Has it an entablature?
   Observe interior—what is its plan?

II. Study the Pantheon.
   How does it differ from the Parthenon?
   Note outstanding differences.
   Study interior—contrast with Parthenon.
   Note decorations and architectural details.

III. Study Notre Dame Cathedral.
   Classify architecturally.
   What is its general plan?
   Note details and decorations.
   How does it differ from ancient temples?

IV. Visit Exhibit of Original Ionic Column.
   Are we correct in our selection of the distinguishing characteristics of Ionic columns?
   How many channels in the shaft?
   What is its relative height and weight?
   Find age and source of this particular example.

V. Columns.
   Note examples and differences of pure and composite orders.
   Were columns designed for use or for decoration?
   Observe the Porch of the Caryatides. Why use human figure?
   Find examples of engaged columns. What is their use?

Aside from discussions, reports, and assembly programs developing as natural concomitants, there also grew out of these excursions many classroom activities which carried further the interests already initiated or

those which had been recently stimulated. Questions or data assembled were responsible for more intensive study on some particular phase of the subject. A part of several class periods was given to listening to reports on the information obtained. These reports represented the directed study on general perplexing problems. To obtain the needed information the children consulted a great number of reference books in the school's library, the classroom reference shelf, home libraries, or sought help from adults interested in this particular subject. Instead of a formal assignment by the teacher, the class decided upon the topics needing further elaboration and clarification. Those children most interested in specific problems volunteered to report at an appointed time on these topics. Aside from the regular classroom activities there were many interesting voluntary responses to the work. These were based entirely on individual interests and represented concentrated study and effort on the part of particular children.

After the children had finished making their rose window, the Industrial Arts teacher planned to take them to the Tiffany Studios from which place they had procured the stained glass for their window. She was anxious for them to see the work on stained glass windows being done at these studios. She also wanted to show the artists there the rose window which the children had made. She telephoned the office of this company and made arrangements for a time when a visit would be most convenient.

The distance from the school to the studios was great

and through heavily congested sections of the city. For this reason the class chartered a commercial bus to take them to and from the studios. Through the school office arrangements were made with the bus company to have the bus wait for the children while they visited these workshops.

Taking their treasured rose window the class, the Industrial Arts teacher, and the classroom teacher left school early one morning. The route over which they traveled was lined on either side with buildings in which the children were greatly interested. The children were able to identify architectural details on some of the buildings which they passed; they classified many of the buildings under the period or style of design which inspired their construction; they pointed out discrepancies and weaknesses in the designs of some of the modern buildings. They had ample opportunity to get very clear views of outstanding buildings along the route. The changing skyline of the city was plainly visible during this ride through the business section. Many of the buildings about which they had talked and read were seen for the first time by some of the class.

Typical remarks overheard during this trip were:

"There's the building which won the architectural prize this year. I like it because it looks as though it was designed to serve its purpose. The architects certainly used modern materials and decorations in building it."

"That awful glass dome is not appropriate to an entrance. It should be used to top a *building* and not a show window."

"Isn't that building awful! It certainly fits the jazz age."

"Classical architecture is appropriate for the Metropolitan

Museum of Art for it contains displays of classical as well as modern art."

"Look at the Caryatides on that balcony! I don't see why they were used on a house of American style."

"I think that the doorways on the Empire State Building are too squatty and low for such a high building. They look out of proportion."

"Those long, narrow windows in that church are not Gothic. They look more like the slits behind which archers stood during the besieging of a Norman castle."

"Yes, and I even think that kind of window might have been seen in early Egyptian temples."

"Really, the Empire State Building looks like an immense monolith."

The entire route was stimulating to the children for it centered their interest and enthusiasm upon the subject of their unit of work, now almost completed.

The visit to the studios was another source of wonder and satisfaction. The men who saw the children's rose window were most complimentary and encouraging to them. They took the window to a special light to get the full effect of the design and the coloring. They praised the children for their splendid work and their concentrated effort in completing so difficult a task.

The teachers explained that the children were somewhat puzzled about a means of hanging the window, and asked for their expert advice in planning for this. One of the men said that they would be glad to attach substantial metal loops to the frame so that the window might be hung on any hooks. He took the window to some of the workmen who promised to have it ready by the time the class had completed its visit.

Then began the exploration of the workshops under the personal supervision of one of the artists. He told the children several experiences he had had in his work about the studio. He came to the studios as an apprentice when he was about twelve years old and had been there ever since. During his apprenticeship he had been trained to work in all of the departments of the studio. He had cut glass for the windows; he had later constructed windows and built mosaics; he had had experience in the art department and in the department of design. At the time of the visit he was making a huge mosaic design upon which he had been working for four months and which was then about four-fifths finished. When the children saw this mosaic piece and observed the detailed workmanship they were impressed by the patience and concentration of artists who would be content to spend so long a time on a single piece of work.

Since the class had gone to the studios primarily to observe the work of making stained glass windows most of the time was spent in the department where this could be seen. The children saw how the work was begun, they saw the artist's sketch, the photographed pattern used by the glass workers, the dissected pattern around which the glass was cut, and finally they saw the frame into which the completed design was fitted. They were especially interested in watching the glass cutters, for these men used the identical method of cutting and "chewing" the glass which had been used by the children. They were fascinated by the perfection of the soldered framework, for they had had similar experiences and they knew the difficulties involved in making an

almost invisible soldering. The different qualities and grades of stained glass used for different sections of the window also engrossed their attention. That one quality of glass was used for draperies, another for background, and another for figure work had, until then, been unknown to them. Neither had they known how the workmen were able to represent so naturally the faces of the figures in the windows. They were interested in one almost completed window on which the faces were merely the outlined contours in clear glass. This was to be painted later in flesh tones to represent the skin.

The children learned that even when a stained glass window is professionally made, it is not made as a unit but is finished in small sections which, later, are fitted into the frame. The frame is hung on an immense scaffolding placed against the light. If there is any defect in the quality or the coloring of the glass, it is readily detected in this strong light.

At the time of this visit five windows were in the process of being built in the studios. Each of these windows was in a different stage of completion. Consequently, the children had an excellent opportunity to observe the making of a stained glass window in all its stages of progress.

The exploration of these studios helped the children to understand and to appreciate the vast amount of time and labor spent by each workman in perfecting his art. The class was amazed to find that all this work when commercially produced is done by hand and not by machinery. To them it seemed almost incongruous that such massive products were built slowly, piece by piece,

rather than assembled in finished parts by some cunningly contrived machine. They had visualized this commercial process as similar to one by which automobiles are assembled in our large factories. The guide explained that mass production on such an extensive scale is appropriate when turning out identical parts or identical finished products; but it is not appropriate to artistic creation. In answer to another question he told the children that some studios made use of mechanical helps in making stained glass windows, but that in the Tiffany Studios all the work is done by hand.

A visit to the storeroom in which the large sheets of glass are kept was the climax of the excursion. Sheet upon sheet was piled on shelves from the floor to the ceiling. Here the children saw rare glass of great value and rich coloring. Some of it was made from formulæ devised by the glass-makers of medieval times. The guide held sheets of this glass up to the light so that the children might see the richness of its color and the rare quality of the texture. As a souvenir of the visit the children were given fragments of this glass which were too small to be used by the workmen. The guide finally explained the process by which some of the Tiffany glass is made and colored.

By the time the exploration of the studios was completed the children's rose window was ready for delivery to them. Not only had loops been attached, but the men had also polished the glass so that it was lustrous and shining.

Before leaving the studios the teachers spoke of the

problem facing the class in making a suitable label for the window. Since it was to be presented to the Parent-Teacher Association and hung in their conference room in the school the children wanted to have an appropriate presentation label made for it. They had thought of making a clay tablet on which they would inscribe their message. The men at the studios, however, suggested that the children engrave a lead plate which would be more in keeping with their gift. One of the men gave the children a piece of lead of the desired size and told them how to engrave it.

As a final rite before leaving the studios the teachers registered the class in the visitor's book kept in the office. Then with a vote of appreciation for the help given them, the children carrying their prized gifts of glass, left the studio for the return trip to school.

On the return trip the conversation centered around the information gleaned at the studios. There were many references made to the completeness of instruction given to them by their artist-guide, to the skill and perfection of workmanship observed in the workers and in the products, but most of the enthusiasm was reserved for the souvenirs of glass which had been given to the class. Seldom before had they received gifts they prized so highly!

After the return to school the class was anxious to begin work at once on engraving the presentation plate. As a group enterprise they composed an inscription which was later to be cut upon the piece of lead. The class then chose the best "printer" in the class to prepare her copy for this important task.

At a subsequent period she worked with the teacher of Industrial Arts and carved with a pointed steel instrument the chosen inscription upon the lead plate. This was then presented to the class for their approval before it was cleaned and polished. The class decided that the plate was too large for the inscription, so it was cut to a more appropriate size. After this process, the plate was cleaned, polished, and made ready to hang under the window.

Towards the close of the spring term the class spent a part of a morning visiting the Riverside Church, the new Gothic cathedral. The children had discussed this building during their previous study of architecture and they had brought to school many clippings, notes, and pictures of this beautiful structure. After they had acquired a background of information about Gothic architecture they were ready to visit it with some degree of appreciation of its beauty and its magnificence. The teacher had purposely postponed the trip until late in the year for she wanted the class to approach this first-hand observation with some measure of intelligence and information.

Previous to the time of visitation the children had been concerned with the style of Gothic construction to which it belonged. Some had classified it as pure Gothic, others as Norman, or modified Gothic adapted to present day needs. To settle this argument as well as to try to find answers to their questions, the class prescribed for themselves certain definite points to be looked for. Though not in written form, each child had a precon-

ceived outline to direct his survey of this church. In substance, the children's outline stressed the following points:

The features of pure Gothic architecture found in the construction of the church.
The features used to modify the pure style.
The styles of architecture from which these modifications are derived.
The details which characterize this as a Gothic building.
The ways in which the architects have adapted it to present day needs.
The innovations introduced in the structure to adapt it to a modern interpretation of religion.
Note the Gothic details observed.

The magazines and rotogravure sections of newspapers were then filled with photographs of this beautiful church. Many of the class were members of the church or had attended services in it at some time or other. The children had also brought many clippings and sketches for the bulletin board display so they were familiar with some of its features.

Throughout the year questions and problems of a specific nature were raised in connection with the clippings and the other illustrative material of the Riverside Church displayed in the classroom. These were filed until the children should be better able to cope with them and until the class was ready to visit the church. One of the children who lived near the church and who had been very much interested in the building since the foundation was dug was quite well-informed about many of the details and was extremely helpful in presenting new angles to the consideration of this example of archi-

tecture. She was also able to supply information and pamphlets about those questions which could not be answered by a visit to the church.

Some of the questions raised by the children were:

Is the church an example of pure Gothic architecture?
Why is the steeple square instead of pointed?
Are the doors copied from any particular European cathedral?
Does the church have flying buttresses?
Does it have a rose window or is it a wheel window? (How can we tell the difference?)
Who planned this building? Who was responsible for deciding the style of architecture?
What are the cloisters?
Are the carillons typical of all Gothic churches?
What was the cost of the building?
Who paid for it?
What do the carvings on the doorway represent?
Are they in keeping with the rest of the church?
Why are gargoyles included in the details?
How is the church lighted? Are the fixtures in harmony with the building?
Where did the stained-glass windows come from?
What kinds of pillars are used? Are they typically Gothic?

At the time of the excursion the children were well equipped and well prepared for a careful observation of the church. At first it was viewed from a distance to get the full effect of the style. Many of the children had previously made a list of the characteristics which identify a Gothic building. As they surveyed the church from several angles, they referred to this list to verify points about which they might be in doubt. This list had been prepared as a summary of the study of Gothic cathedrals and was titled *How to Recognize Gothic Archi-*

tecture. It included such items as are shown in the two following lists.

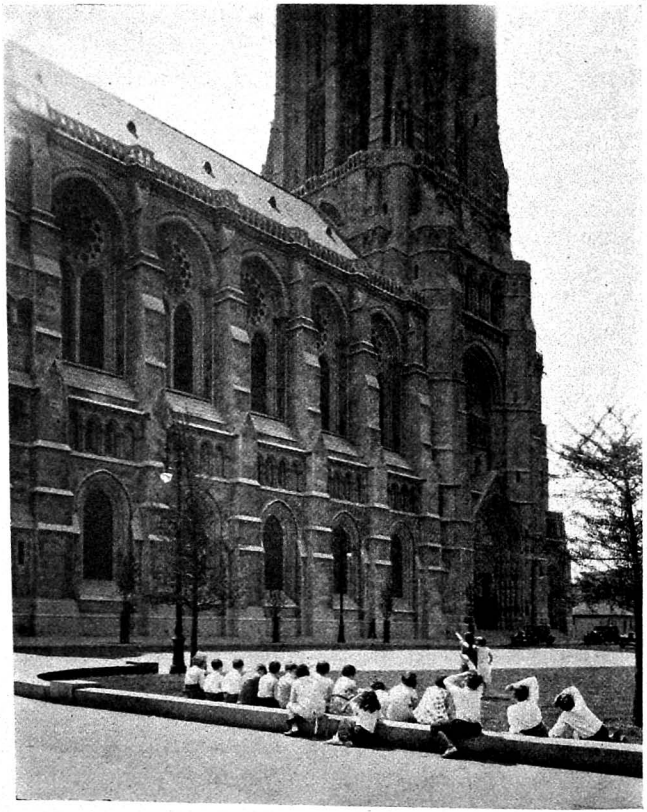
Characteristics
- Pointed arch
- Clustered columns
- Traceried windows
- Stained glass
- Vaulted roofs
- Flying buttresses
- Spires and pinnacles
- Gargoyles

Ornaments
- Symbolic designs
- Realistic use of nature; deep shadows
- Quatrefoil, trefoil, etc.
- Dog-tooth ornaments
- Ball flowers
- Four-leafed flowers
- Tudor rose
- Portcullis

Then, going nearer to the church, the children studied the details found on the exterior. They were especially interested in the sculptured figures, the arched doorway, and the beautifully wrought doors. Many of the children were able to interpret the symbolism portrayed in the carved figures and decorations. The grotesque figures on the columns, the gargoyles, and the general setting of the church were also studied in detail. The class was disappointed not to find flying buttresses to help support the weight of the building. However, the children decided that the addition of these features would have been used for appearances only, for the weight of

the building was balanced on the structural iron which formed the framework of this modern church. As each child found some Gothic motif or decoration he noted this on the pad which he had brought for this purpose. If he was not sure of the identity of some particular detail, he made a rough sketch of it or wrote a brief description of it. Later, an authoritative reference book was used to identify the detail and its use.

Entering the building the children first visited the nave of the church. Here they were struck with the completeness and magnificence of a modern temple. Especially were they interested in the stained-glass windows and the intricate, lacelike stone work on the altar. One of the first features for which they looked was the rose window. The carving on the choir stalls, the pews, and the grille also attracted their attention. When they were in doubt about any particular feature they referred either to the teacher or to those children who had made Gothic architecture their major study in the unit of work. Groups of the children gathered around any of the better qualified students of Gothic architecture as they went through the building. In this way they derived double benefit from the trip for they had their own knowledge of this style as well as the more extensive body of information held by these more informed students of this particular period. Whenever an argument arose, some child always sought the opinion of these children and their opinion or judgment usually settled the discussion. On some matters the entire class was unable to make decisions, so these inquiries were noted for further discussion in the classroom. One of these was concerned



AFTER HAVING BECOME FAMILIAR WITH THE ORIGINAL GOTHIC CATHEDRALS OF EUROPE THROUGH THEIR STUDY OF MEDIEVAL LIFE AND THE ARCHITECTURE OF THE PERIOD, THE CHILDREN VISIT THE RIVERSIDE CHURCH TO SEE AN EXAMPLE OF A MODERN GOTHIC CATHEDRAL. HERE THEY CHECKED THEIR INFORMATION OF THE PURE TYPE AGAINST THE DETAILS THAT THEY OBSERVED IN THE RECENTLY BUILT AMERICAN STRUCTURE

with the placement of the building in relation to directions. Some of the children claimed that the nave of a Gothic cathedral always points east and west whereas, in the Riverside Church, the nave points north and south. This, the children claimed, was a violation of Gothic principle for, they said, the apse should always be placed in the direction of the rising sun. Another argument arose about the significance of the number of steps leading up to a Gothic church. One of the girls stated that the number was always uneven while others argued that this principle was an architectural necessity only in the ancient classical temple but was disregarded in later Christian times. Both these questions were studied more intensively at a later time after the class had had time to find the opinions of accepted authorities on Gothic architecture.

Passing from the main body of the church the class inspected the small chapel near the right of the entrance. Here they were anxious to identify as many of the Gothic details as possible. The children were especially interested in the lighting fixtures. They wondered if these modern details of illumination were duplicates of those lights used in the Gothic period or whether they were a modern interpretation of the kind of lights fitting to a Gothic cathedral. In the chapel, as in the nave of the church, the children made note of all the details that they could identify or thought were of pure Gothic inspiration.

They especially wanted to see the device by which the bells were rung, but that privilege was denied them. The carillon tower and the offices of the church organ were

not open to the public on the day of this visit; however, a great number of the children had already seen these rooms and were able to give a description of their appearance. All the children had heard the carillon chimes ring at some time since the bells had been installed and, naturally, they were personally curious about that section of the church in which the carillon was played.

They were able to visit the club rooms and the recreation rooms in the lower church so they gained a vivid impression of this most notable departure from Gothic principles of cathedral building. Here was a church which was a social, as well as a religious, center. In the Gothic period, cathedrals were built exclusively for worship and for religious instruction. The purpose of the cloisters confused the children for they could see no reason for giving them such a name when their use was so modern. However, in spite of all their objections, the class voted that they liked the idea of a church devoted to the general use and enjoyment of its members. This adaptation of a church building to the needs and demands of modern life was quite in accord with their opinion of the function of a church.

As the children once more walked around the building on their way back to school they noted the rounded window on the lower exterior of the apse. This was a Roman or Romanesque detail which was quite out of harmony with a Gothic building. They argued that on account of their position these windows needed the extra support given best in the rounded form. The principle of the keystone was recalled by one of the children who remarked that the stone window frames had a great

weight to uphold and that the classical form could best support it. To this another child retorted that in a modern building the iron structure met this requirement and therefore this rounded form was useless and out of place. No decision could be reached in this matter, so one of the girls said that she would try to get the architect, who was a personal friend of her father, to explain the use of this non-Gothic feature.

When the children returned to their room they compared lists of details which they had made while visiting this church. Two of these are here reproduced. The first list is that prepared by one of the children most interested in Gothic architecture. The second is the list of a child whose major interest in this unit of study was in the classical architecture of the ancients. Naturally she was more observant of obvious features and, while she recognized generally the moldings used as decorative details, she was not qualified to identify or name them specifically as was the first child.

LIST I

Gargoyles	Vine molding	Crocket
Clustered columns	Flowing tracery	Round arch
Pointed arch	Fan tracery	Statues
Gabriel and trumpet	Nave	Vaulted roof
Spires and pinnacles	Apse	Wheel window
Rose window	Grape molding	Rosette
Cinquefoil	Sculptured designs on windows	Ball flower molding
	Gables	Stained-glass windows

LIST I—*Continued*

Dog-tooth molding
Griffe
Angel-figures
Trefoil
Tablet flower
Buttress
Ogee arch
Arcade of pointed arches
Arcade of rounded arches
Crochette
Tracery
Vaulting
Quatrefoil
Clustered piers
Four-leafed clover molding
Transept
Odd number of steps
Portico
Triple gothic window
Tudor cresting
Flamboyant tracery
Cusp arch
Saints
Cornice
Ribbed vaulting
Parapet
Zigzag molding
Indented molding
Double cone molding
Cable molding
Alternate billet molding
Pellet molding
Beak bead molding
Nail bead molding
Embattled molding
Ogee arch arcade
Grotesque figures
Horseshoe arch
Trefoiled arch
Stilted arch
Two-centered arch
Cloisters
Capitals of figures for columns
Lancet architecture
Bar tracery
Boss
Keystone
Mullion

LIST II

Pinnacle
Buttress
Gargoyle
Stained glass
Cinquefoil arch
Trefoil arch
Trefoil
Quatrefoil
Sexfoil
Multifoil window
Engaged columns
Clustered columns
Pointed arch
Pointed arch window
Lancet arch
Ogival arch
Double arch
Round arch
Ogee arch
Cupola

LIST II—*Continued*

Sloping or battering roof	Grotesque
Rosette	Balustrade
Corbel	Boss Molding
Console	Tracery
Fleur de lys	Dentils

These two lists are not mere tabulations of architectural terms; they represent the results of intensive study, for the children had to know the meanings of these words before they could be applied in the identification of details.

Many other children made very limited and less accurate lists of the detail observed. This may have been due to any of several reasons. Many in the class had not made so intensive a study of Gothic architecture as had others and therefore were not so familiar with the detail of this style; many did not really recognize the modified use of the design; some were less inclined to make full notes and sketches. Two more lists are given here so that the reader may contrast them with the longer lists already given.

LIST I

Pinnacles	Dentils
Gargoyles	Pediment
Buttress	Saints
Arches	Keystone
Columns	Moldings

LIST II

Grotesque figures	Nave
Rose window	Clustered columns

LIST II—*Continued*

Portico	Pointed arch
Traceried windows	Statues
Pointed arch window	Moldings (many kinds)
Pinnacles	Buttress
Sloping roof	Cupola
Arcade	Rosette
Grape molding	Ornamented capitals
Apse	Vaulted roof

Regardless of length, however, these lists have a greater significance than the mere ability to recognize certain architectural details. Without rich meanings behind them they would be simply "busy work" or rote learnings to be forgotten when the immediate need for them had passed. The teacher was not so insistent that each child be familiar with all the details as she was anxious to have the class aware of the general features of this style of architecture as it is distinguished from the other styles designed by man when he attempted to create something outstandingly beautiful. The less familiar terms will be forgotten, but the general impressions of man's effort to put into form some of his ideas of dignity, rhythm, and spirituality will be the permanent possession of these children. The spirit behind the learning, not mere fact acquisition, is the most valuable measure of achievement.

During the discussions following this excursion, the class considered the questions which they had raised before visiting the church. They presented data to substantiate their arguments that the Riverside Church is a modified Gothic building, built to fit into its environ-

ment in a crowded city and to contribute to the needs of its members in a modern civilization. These discussions were in reality comprehensive summaries of their study of Gothic architecture, for almost every essential characteristic was talked about in the arguments presented. Not once were the children conscious only of outward forms, for they went back into the history of the medieval period to interpret the motives for cathedral building of that time to contrast them with modern influences which direct the builder of churches.

In the vicinity of Lincoln School there are two noteworthy buildings to which the teacher also planned excursions. One of these is the Notre Dame Church, the other Columbia Library. The architectural style of both buildings reflects the classical influence.

At the time that these excursions were planned the class was interested in tracing the origin and adaptation of certain classical details which are found in many of the present-day structures. They set for themselves two criteria for justifying an architect's choice of applying these designs to modern buildings. They asked: Is the modern building used for purposes at all comparable to the uses of the original type? Are the decorations and details appropriate to the style of the building?

The children first visited the Notre Dame Church and studied the façade and other exterior features. They agreed that the entire structure reflected a strong classical influence but that it was neither pure Greek nor pure Roman. Features of both styles were noted during this tour of inspection. The pupils agreed, likewise, that the

architect was justified in using a classical form for a church of this denomination because its prototype, the early temple, initiated this style of architecture. This modern adaptation of the ancient temple seemed to be patterned more upon the lines of Roman architecture than upon the Greek. However, details which were definitely Greek were found in the decorations of this modern structure.

The interior of the church was planned to fit the needs of its present-day use and showed no evidences of a mere adaptation of the ancient temple interior. The decorations were appropriately designed to suggest the beliefs and practices of the congregation. The similarity between this church and the classical temple was manifest only in general shape and exterior appearance.

The children felt that a Gothic building would have been a more appropriate style for this church inasmuch as the Gothic style was originated in the Christian era. They felt that such a building would have been more in keeping with the dogmas of the Church. The teacher asked them to recall some of the outstanding features of a Gothic building (its great size, and its spacious interior) and then to try to visualize such a structure on this small tract of land and in this particular locality. They saw at once that such a building could not have been erected here; they recognized the limitations placed upon the architect and agreed that, under such circumstances, he had shown great wisdom in choosing his design.

Before they left the church the children were anxious to list the details found on the exterior. In addition to

noting these the children also made pencil sketches of them. These sketches later were used as part of their notebook content.

Two typical lists of details prepared by the children are here cited. These lists identify the details with which the class was familiar.

DETAILS FOUND ON NOTRE DAME CHURCH

List I

Greek:
- Egg and dart
- Leaf and dart
- Corinthian column
- Abacus
- Plinth
- Flutes
- Dentils
- Modillion
- Bead molding
- Entablature
- Pointed pediment
- Console

Roman:
- Engaged columns
- Ornamented cornice
- Ornamented architecture

Miscellaneous or Mixed:
- Rosette
- Torus

List II

Roman:
- Engaged column
- Composite column
- Ornamental abacus
- Ornamental architecture

Greek:
- Egg and dart
- Leaf and dart
- Acanthus leaf
- Cornice
- Half Round molding
- Flutes
- Dentils
- Balustrade

Others:
- Soffit
- Torus
- Console
- Rosette
- Mitre

When the class later visited Columbia Library they found similar difficulties in identifying the style of architecture employed. The building reflected more of the

Roman influence, however, even though the details seemed to have been derived from the Greek. The shape of the building, the manner of treatment and, especially, the domed roof made them identify the library as a type of Roman adaptation. The class agreed that the purpose for which the building was used justified the choice of architectural style.

Once more the children made lists and sketches of the details which they recognized. Examples of these lists are quoted below.

LIST I

Details showing Greek and Roman influences

Leaf and dart molding
Egg and dart molding
Ionic column
Abacus
Cornice
Plinth
Anthemion
Acanthus leaf
Flutes
Dentils
Modillion
Bead molding
Entablature
Half Round molding
Frieze
Architrave
Cavetto molding
Engaged columns
Domed roof

LIST II

Roman details with Greek terms

Egg and dart molding
Ionic column
Leaf and dart molding
Acanthus leaf
Anthemion
Bead molding
Dentils
Entablature
Console
Abacus
Keystone
Dome Roof
Engaged columns
Rosette
Cavetto molding

The final excursion of the year was the boat trip around the Island of Manhattan. This trip, as planned by the teacher, had a dual purpose: first, to give opportunity to observe the sky line of the city and to note the changes being made and the efforts to beautify Manhattan; second, to provide an occasion for a final party before the class disbanded for the summer months. By class decision, it was settled that this party should be a picnic.

Each child brought his own lunch and sufficient money to cover all his own expenses in connection with the trip. He managed his money personally, paying his own fare on trains and boat. The trip might have been made more comfortably in private automobiles or in the school bus, but the teacher rejected these possibilities in favor of the elevated train. She did this chiefly for the benefit of those children who had never had this experience or who had never ridden in these trains except under the vigilant surveillance or control of an adult. In this instance the entire group was conducted by three adults whose presence assured ample safety and protection to each child, but did not restrict their freedom on the trip.

A single instance proved to the teacher the justification for using this means of transportation. One of the girls had never before ridden on such a conveyance and she was somewhat alarmed at the thought of riding through the city at such a height. No one held her by the hand, no one guided her through the crowded car, no one secured a seat for her—and these were all novel experiences. She had to take care of herself and this independence was a new emotion. After she had overcome

her timidity, she asked numerous questions about the height of the elevated tracks and about their construction; she was interested also in finding out how the trains were operated and the different routes they traveled. She expressed a desire to look down on the street below, but she was afraid to do so because it might make her dizzy. A group of the children had worked their way to the rear of the car and were wrapped in the observations they made as the train passed through the city. This fascinated the less-experienced girl. She was torn between two desires; she wanted to join the group at the rear door where she might satisfy her curiosity, and she wanted to stay close by the teacher for protection. Eventually her curiosity overcame her fears and she, too, walked through the moving car and joined the group at the door. There she remained until the train reached the end of the island. Never before had she felt so free nor so self-dependent. If for no other reason, this child's experience alone was worth all the other values derived from the trip.

Along the route to the pier the children were interested in the buildings they passed and in the changing panorama of the city shown throughout this ride. As they recognized or identified buildings the children called attention to them; they asked numerous questions about styles of architecture, or recalled some phase of their study which helped them to point out certain architectural features. Although no specific instructions had been given to use this excursion as a part of their school experience, the children consistently associated each succeeding experience naturally with their unit of work.

The class boarded the boat some time before it was ready to leave the pier. Other sightseers were also aboard and they viewed the children with some concern. However, throughout the trip the class stayed in a group near the stern of the boat and did not interfere with the pleasure of the other passengers. In fact, the weather was their ally, for soon after the boat left the pier a light rain fell which drove the other excursionists to a glass enclosed section of the boat. This left the entire open deck to the children and they used it to fullest advantage.

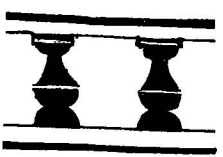
Shortly after the boat headed around the end of the island lunch boxes were produced and a general agitation about being hungry was signalled from child to child. Although it was not yet noontime, they persisted in their demands for lunch. What was the purpose of a picnic if not to eat? To this inquiry everyone gave assent, so boxes were untied and the ceremony of exchanging choice sandwiches, pieces of cake, or other delicacies was in process. The spirit among the children was admirable for each wanted to share with the others whatever food their boxes contained. Since this excursion was a real picnic, eating was the chief pastime of the day. It was interrupted now and then as the boat passed familiar spots, or as the children asked for help in recognizing locations or in identifying certain buildings. The rivers bordering the city and the bridges which spanned them were named, and the geographical boundaries of the city were pointed out by some of the children.

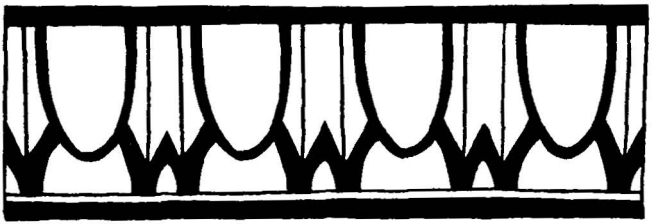
The view of the city from this moving vantage point was impressive and gave a clear idea of the housing problems in such a congested metropolis. Some of the

pupils had brought their cameras and, whenever possible, they took pictures of picturesque settings or of new angles of familiar spots. Those children who had never before been around the island were given any information they needed to orient themselves.

The trip by boat required about three and a half hours' time and the trip to and from the school required an additional two hours, but the entire excursion was easily conducted in the period of a school day. The class had returned to the classroom in time for the scheduled afternoon dismissal.

The children were somewhat tired at the close of the day, but they were enthusiastic in their appreciation for the trip. No casualties occurred, no one was ill, and everyone had had an enjoyable day. The children voted the excursion the best they had ever taken. No reports were asked for, no discussion followed the trip (except as questions were asked while on the boat), no record of their experience was made. In fact, it was a childlike activity, an unrestrained party.





Chapter VI

SUMMARIZING AGENCIES

THE topics in this unit of work were not studied chronologically nor in any set order of sequence. The children chose those in which they were most interested. They also found and selected the facts which they considered essential to the understanding of these topics. At some time during the course of the year, it was essential for the class to see the topics in their correct chronological order and in their relation to each other. This was the purpose of the various kinds of summaries which are described in this chapter.

Several times during the progress of the unit, the teacher provided means for organizing and summarizing the outstanding topics or items of interest. At no time, however, did the children feel that a periodic mechanical summary should conclude a topic of study, nor was there a feeling that each topic was completed after it had been summarized. Whenever any summary was given, it was

made in the spirit of social contribution and intercourse, and no teacher pressure was exerted.

The summaries consisted of oral and written reports, reviews, and résumés of activities, or of discussions growing out of problems, as well as explanations of graphs, charts, and other visual means of recording topics of interest. However, these summaries were of a partial nature only. They were given at irregular intervals during the year or at such times as there was an expressed need for such a procedure. Periods devoted to summaries usually occurred when specific topics had been more or less exhaustively studied and freely discussed. In other words, most of the summaries were but the natural conclusions and deductions drawn from concentrated study of one phase of the more general topic. They were cumulative by nature and became the starting points for further study or research. In attempting to make each summary, the children found discrepancies in their conclusions and thus further study was initiated.

It was not until most of the data for the partial summaries had been assembled that any semblance of a general summary could be effected. When the need for this compilation was felt, it did not assert itself in an organized outline form. Rather, it grew from the need to *do* something about the material which they had studied and enjoyed. It rose from a spiritual and creative urge. How, then, could this unit be summarized so that its greatest intrinsic values would not be lost or submerged under a flood of almost useless memoriter responses?

In substance, this was the kind of query raised by each class interested in the unit of work. This question and the urge to share with others the pleasures to be derived from the unit impelled the children of the first class to make a request for a program for the general school assembly. They asked that two kinds of material be presented—one of a strictly informative nature and the other of a more creative type.

For the first part of the program, they decided to give the audience some facts about the development of architecture. As it worked out, this factual presentation was composed of oral reports, résumés, charts and other illustrative material summarizing or stressing different phases of the study. It represented a summary of architecture from the time of prehistoric man to the unfulfilled dreams of the future.

As this activity was based on a complete résumé of the content of the unit of work, its possibilities as a summarizing agency are self-evident and need but little elaboration. However, it might be of interest to the reader to learn some of the work involved in this activity.

To insure a logical arrangement of architectural forms, the class presented their data in a somewhat chronological order. All informative and illustrative materials relating to a particular era demanded by the report had to be classified, assembled, and verified. Those children whose major interests were founded or centered in that period of development of world architecture acted both as contributors and also as "clearing houses" for other children. No suppositions, uncertainties, or vague notions could pass this critical board of censors.

The speakers were chosen by the class. In each case they represented the child best qualified and best prepared on a topic to present a report of it to the assembly. Each child first wrote out his speech. He read it to the class for criticisms and suggestions. The class chose the pertinent and related facts needed for the report. Then the speaker was given time to consider the recommendations of the class, to reorganize his report in the light of these recommendations, and to collect such illustrative materials as he needed. When his report was satisfactorily organized, trial speeches were made and criticized constructively. Elaborations of detail and content were offered to the speaker. The speeches were not memorized for the assembly program. Having written his report, however, the speaker had clearly in mind the logical sequence of his topic.

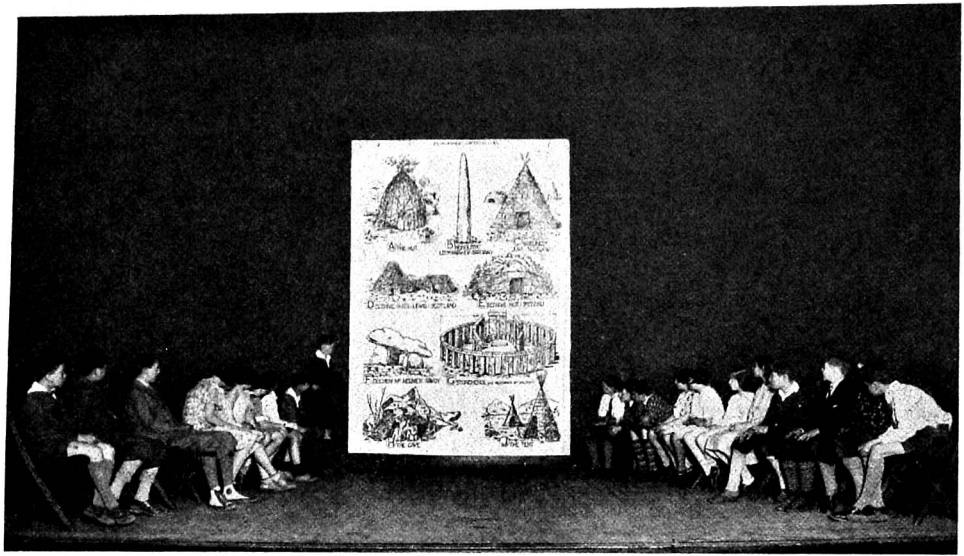
The factual program when presented developed the following ideas:

What the Word Architecture Really Means
Why Architecture Came Into Use
The Difference Between the Builder and the Architect
Nature as an Architect
The Work of the Primitive Architect
The Outstanding Periods of Architecture
Architecture as Interpreted by:
- The Egyptians
- The Greeks
- The Romans
- The Moslems
- The Cathedral-builders
- The Americans
- The Moderns

The Conceptions of Future Architecture

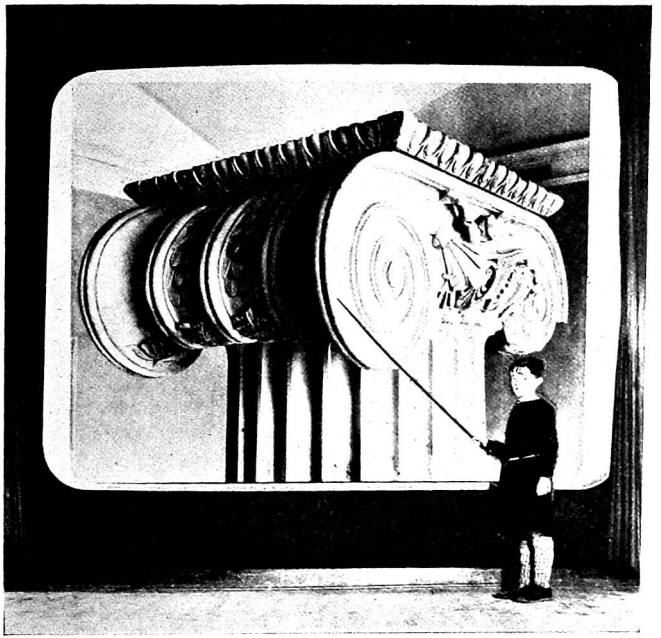
Two types of visual material were used—mounted illustrations and lantern slides. The mounted illustrations were prepared by the children and included enlarged outline pictures, graphs, and diagrams of architectural forms and details. Those children most interested in particular periods or in certain phases of the subject made reports stressing the most important ideas contained in their selected subjects. The mounted material was used to illustrate the points in the report. For instance, one child whose major interests in the unit of work centered around the characteristics of modern architecture, chose an illustrated chart of the Chrysler Building to emphasize her topic. On it were shown two views of this building. As the child talked to her audience she made use of this chart to exemplify the points she made in her report.

The lantern slides were secured from one of the city's museums and were of the standard type. Some of these slides were close-up views of buildings or details of ornamentation. These views were used to show the audience the importance of architectural detail or decoration and its contribution to beauty and to use. The children presenting this report first showed the audience some building which was architecturally significant. Then they told something of its history and construction. Other slides showed several features of one type or period of architecture or illustrated the evolution of certain features common to many styles of architecture. For example, one boy whose persistent interest had been centered on a study of prehistoric man, found that he could use effectively a slide showing the evolution of the post and



A PUPIL TRACES THE PRINCIPLE OF THE POST AND LINTEL FROM PREHISTORIC TIMES.

lintel principle which later became our doorway. He drew fully upon his information of ancient man, pointing out to his audience the earliest uses of such forms.



A CHILD ON THE CONTENT PROGRAM SHOWS THE ELEMENTARY ASSEMBLY A SLIDE OF AN IONIC COLUMN AND POINTS OUT THE TYPICAL DETAILS OF THE ORDER.

The many examples of this principle helped the audience to visualize its importance in architectural construction and to appreciate the contribution of ancient man.

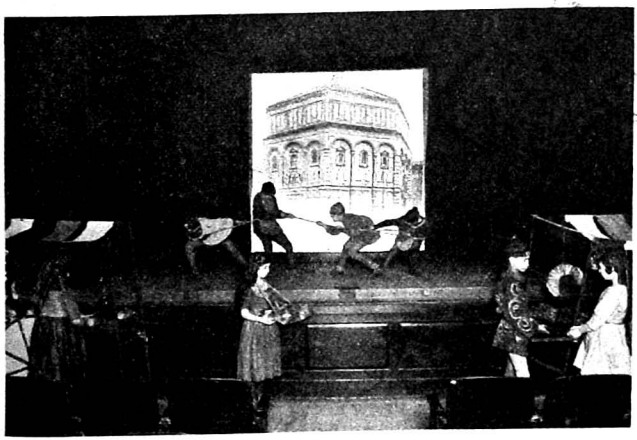
For the second part of the program the children

thought that they would present in dramatic form some phase or episode in the story of architecture which, from the point of view of the audience, might be even more interesting. The children set to work to analyze the many fields of interest into which the study of architecture had led them. The field was quite extensive. Reference books were searched for possibilities and each possibility was analyzed and recorded and the lists of references used were filed for future consideration. None of the material, however, had been presented in dramatic form. The children concluded that they would have to select from a general theme some specific topic of interest and from it develop their own dramatization.

The incident which the children finally chose was found under the title of "Ghiberti and the Goblins" in Katharine Gibson's *The Goldsmith of Florence*.[1] The story is presented in prose form, but the fullness of detail with which it is treated makes it a rich source of dramatic possibilities. Before the actual rehearsing of the play, the teacher arranged to have mimeographed copies of the chapter given to each child. Discussions followed during which incidents irrelevant to the main plot were eliminated. Groups of children sought out additional information from the school library or from books in their own home libraries. Any information that would add force or romance to the play was woven into the theme for the dramatization.

When the class was thoroughly familiar with its adapted plot, it was divided into scenes as indicated by the action of the story. After these settings had been

[1] Published by The Macmillan Company, New York, 1929.



SCENES FROM THE PLAY "THE WONDERFUL DOORS," BASED UPON THE ACHIEVEMENTS OF LORENZO GHIBERTI, THE ARTIST WHO DESIGNED AND MADE THE BRONZE DOORS FOR THE BAPTISTRY OF SAN GIOVANNI.

chosen there was a "try-out" period during which different groups of characters gave spontaneous versions of the incidents in the scenes. The remainder of the class acted as judges and critics. No attempt was made to standardize either the dialogue or the action; each group felt at liberty to interpret the scene in its own way. No child was coerced into a rôle if he himself did not wish to portray that character. Eventually a full cast was chosen by the class. This was made up of those children who were considered the best actors and actresses. For several rehearsal periods this dramatization was purely spontaneous; nothing was written on paper until a clear and definite idea of the dialogue was well in mind. Then, in order to keep a permanent record of the play, the dialogue was written down as it was spoken by the players. Groups of children selected different scenes to write. Then the groups got together, compared notes, and compiled the best of the written versions. This form was then typewritten and mimeographed so that each child in the class might have a copy of the play.

The next important point for decision was the consideration of the scenic background. The action of the play took place before the famous carved doors on the Baptistry at Florence. That these were art products and the results of years of work did not deter the children from suggesting that they themselves should make copies or models both of the church and of the doors. The teacher, however, pointed out why the class plan would not work, and suggested that some other more feasible plan would have to be substituted. The class readily accepted her suggestion but the children persisted

in their idea that all action of the play must take place against a background of the Baptistry and the famous doors. As an actual reproduction was impractical, some other medium had to be found through which to represent the scene. The children suggested that they use a large picture of this building and its doors. The process of enlarging their small print was too intricate and too involved for children to undertake, however. The teacher then suggested that a stereopticon could be used effectively to provide this background. A photographic reproduction of the building could be thrown on the screen and this reproduction could become the setting for the play. The suggestion, besides being practical, had an advantage in that the scene might be changed by changing the slides. By showing more than one view of the Baptistry variety of setting might be introduced into the program.

The children accepted this plan enthusiastically. They found the sources from which they could procure slides and attended to all the detail of trying them out before a selection was finally made. Later, when the production was in the final stages of dress rehearsal a committee ordered the lantern slides from the museum. When these were delivered, the committee also arranged them in the order of their use in the play and cared for them until after the program had been presented.

The use of slides for both the subject matter résumé and the more creative dramatic production served as a medium for binding the two kinds of programs into a more unified whole. It also gave a feeling of authenticity to the play for the background was an actual photo-

graph of the building and not an imaginative composition. Heretofore these children had been accustomed to make their own scenic effects for their plays, but this newer and more unused procedure was equally as accept-

THE CHILDREN "TRYING OUT" FOR RÔLES WHICH THEY DESIRED TO TAKE IN THE PLAY. FROM THIS KIND OF SPONTANEOUS DRAMATIZATION, DIALOGUE AND ACTION FOR THE FINISHED PLAY WERE DEVELOPED.

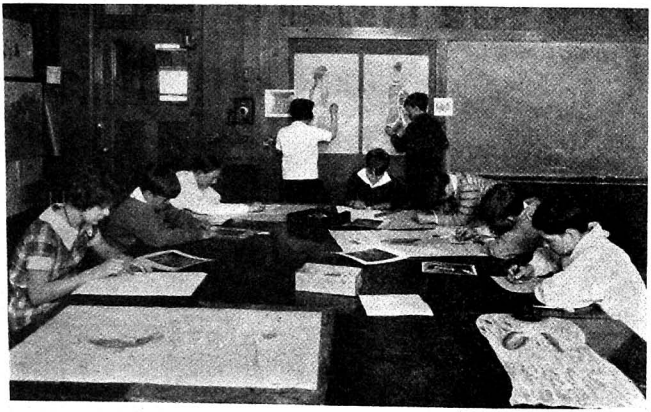
able to them. The very nature of the material appealed to their sense of novelty and experimentation.

In order not to deprive them of the joy of creating something for the scene, the teacher suggested that an Italian street might easily become a part of the setting. The children accepted this idea also. They decided that

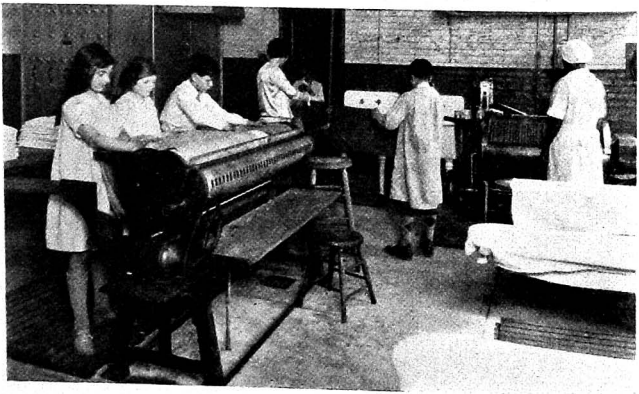
the stage and forepart of the auditorium should become the street and that in this street vendors or market women should sell their wares from street carts to the "populace." Photographs, books, and magazines contributed much of the desired information. A glimpse into the daily lives of the Italians was provided by means of a trip into an Italian quarter of the city. This gave the pupils the inspiration to complete their plans. Carts were made, draped, and equipped; "market women" were selected; and a typical street scene was as closely reproduced as the children could make it.

After the permanent cast had been chosen, the remaining members of the class volunteered their services for the other tasks necessary to play production. A stage manager and a stage crew were needed to shift scenery and to care for the properties. The intricacy of manipulating special lights required the services of one particular child. Another child was needed for the curtain. Thus many additional duties were assumed by those children who did not take an active part in the dramatization.

Costume designing and sewing were two of the vital activities undertaken in connection with producing the play. Famous paintings, historical settings, and authentic costume plates were the source materials from which designs and styles were selected. The principles of color harmony, effective groupings, and ornamentation were discussed at length before any costumes were made. Rough sketches were drawn to show the costumes considered suitable for each character. Appropriate materials were bought, dyed (if necessary), and decorated with selected



THE CHILDREN DESIGNING COSTUMES FOR THEIR PLAY. THOSE STANDING AT THE BOARD ARE COMBINING INTO THE COSTUMES THE DETAILS FOUND IN PHOTOGRAPHS BY THE OTHERS.



THE CHILDREN DYED CLOTH AND WENT TO THE SCHOOL LAUNDRY TO PRESS AND FOLD IT BEFORE MAKING THEIR COSTUMES. FLATIRONS MIGHT HAVE BEEN USED BUT THE SCHOOL MANGLE MADE AN ESPECIAL APPEAL.

MAKING AND FITTING COSTUMES IN THE SEWING ROOM. NOTE THE BOY AT THE SEWING MACHINE. DURING THIS PERIOD, BOYS AND GIRLS WORK TOGETHER.

designs and motifs before they were cut to patterns made by a group of the girls. Then the actual sewing and fitting of costumes were begun under the direction of the Household Arts teacher. This was a simple and natural activity, participated in both by boys and girls.

The purpose of giving this play was two-fold: to give pleasure to an audience made up of the elementary school pupils, and parents, and other interested adults; and to sum up and clinch impressions and concepts derived from the unit of work.

In addition, there were other objectives set by the classroom teacher and reached during the preparation of this dramatization. From the responses of the children participating in the dramatization, she was able to check upon the number and quality of the learnings which had resulted from the year's work as well as to discover whether the study had resulted in an emphasis upon the important facts and concepts. From these responses and indications, she made a new outline for the development of the unit with the succeeding grade. As for the children, they reviewed and renewed their interests in the subject matter involved as they called upon facts and data to verify or to enlarge upon the information needed for the play.[1]

Each succeeding class naturally feels the stimulation and carry-over from the interests and activities of the preceding group. These exert a great influence upon the choice of activities and the selection of materials for each successive class.

[1] The complete text of this play may be found in *Plays: Dramatizations by Sixth Grade Children*, Barnes and Young. Published by Bureau of Publications, Teachers College, Columbia University, New York, 1932.

ILLUSTRATING TWO OF THE COLORED COSTUMES MADE BY THE CHILDREN AND USED IN "THE WONDERFUL DOORS"

The influence from the interests of the preceding grade was noted when the second sixth grade class planned for its assembly program. However, the interests of the later class found expression along quite different lines. These children took great joy and delight in manipulative activities and less satisfaction in the intellectual side of this study. If the concepts and facts learned could be applied to some constructional activity, then the pupils derived the desired satisfaction from their study.

It was not surprising that when this class considered an assembly program they chose quite a different presentation of the content materials. The teacher, also, was anxious to introduce a new note into this program. Before the class had considered the program she had anticipated their demands. She was so thoroughly familiar with the attributes of the class that she could easily anticipate a program requiring manual activity. She scanned the field for possibilities of utilizing this tendency. The shadow picture or shadowgraph seemed a likely possibility. This medium of entertainment consists of throwing shadows upon a sheet. The object from which the shadow is to be cast is placed between the sheet and a strong light. By regulating the distance between the light and the sheet the shadow can be enlarged or diminished in size as desired.

Before the teacher could suggest a plan for such a program she had to make certain that it could be accomplished. Consequently experiments with materials and equipment had to be conducted to test the practicability of such an activity. Three children and another teacher planned with her for a trial presentation. The general

scheme was outlined to the children, but no details were considered at the time. The children chose three or four clear cut designs that might be used for shadows. These they cut out and attached along the top edge of a narrow wooden strip which served as a handle by which they could hold the stencilled design. The teacher brought a large muslin sheet to school and stretched it across the stage. From the school supply-room the children borrowed an extension cord for the light attachment, and four electric light bulbs for trial—a clear glass 75 watt bulb, an orange colored bulb, a blue glass bulb, and a 40 watt frosted bulb. In order to prevent too great a diffusion of light on the sheet, the teacher provided a shield or reflector. An ordinary megaphone served the purpose. At each trial a bulb was confined within this megaphone and the light was thrown on the sheet. This illuminating device was tried in different positions and at different angles in relation to the sheet in order to determine how the sharpest shadow could be thrown. The 75 watt bulb was tried first. It was too bright and it "spotted" the sheet with a glaring reflection. For the second trial, the orange colored bulb was used. It gave a reddish effect to the sheet and was not sufficiently powerful to throw a sharp shadow. The children suggested that the blue bulb might remove the undesirable color effect from the screen, so it was tried. However, the blue light clouded and dimmed the entire sheet to such an extent that no shadow could be produced. Then the ordinary frosted reading bulb was tried. It, too, "spotted" the sheet somewhat, but it produced better results than any of the other bulbs used.

While the children were preparing the program the teacher was seeking for some way to produce a still better light to throw the shadowed stencils on the sheet. One of the other teachers suggested that an arc light might prove more satisfactory, for it would produce a soft and steady light that would cover the entire sheet. The teacher went at once to the High School science laboratory to see if such equipment was available. The Science teacher unearthed an enclosed carbon arc lamp which he thought might serve the purpose. He took the light to the auditorium and connected it while the classroom teacher found the children who were to operate the light. When they arrived in the auditorium the light was working splendidly. The Science teacher instructed the children in the use of this lamp and expressed his willingness to attend rehearsals in order to operate the light. However, the children assured him that they thought they could operate it without further help.

At the next rehearsal period the new light was used satisfactorily so the children decided to abandon their former plans for using electric light bulbs.

The stencils also required a certain amount of experimentation. At first, they were held mid-way between the light and the sheet and then advanced nearer the sheet until a sharp shadow of them was obtained.

When trying out these possibilities, one person held the stencils in position while the others passed judgment upon the success of each trial. The group decided that such a presentation was possible but stipulated that a different kind of pattern or stencil would have to be used if an effective program was to be presented. They

suggested that large cut-outs would be much better fitted to the purpose of the program.

Two of the children each assumed the responsibility of trying to make a pattern for trial purposes. The problem for this working committee was to visualize the shadow before cutting the stencil.

Large sheets of oak tag cardboard were given to them for their patterns. Each chose an example of a construction principle for his large cut-out. One drew an obelisk and the other drew a pointed arch with its wheel window. The class enthusiastically watched the work of this small committee and offered them many valuable suggestions. For example, when the two workers started to cut their stencils (a term which they now used for the cut-out) with ordinary pocket knives, someone suggested that a razor blade would be a better tool with which to work. It was tried and found to be easier to manipulate, so it was used in making the rest of the stencils.

Class enthusiasm ran high during these first planning days. The entire group had taken over the idea of a shadow-picture assembly without any formal acceptance of a plan. They talked about "our shadowgraph" and "our shadow-picture" assembly as though such a presentation had been anticipated and planned. During all this time the class was not certain that the program could be presented for a general assembly, but the teacher had sufficient confidence in the children to know that they would carry it forward as far as possible. Nor would she have allowed them to feel failure or dissatisfaction had their plans not been entirely successful. If

the program had not worked out to be of general interest, the teacher would have arranged for a limited and selected audience for the presentation. Another class could have been accommodated in the sixth grade classroom, or other small groups might have been invited to the auditorium to enjoy a program illustrated by the shadow pictures. The non-active spectators were curious to see these shadows projected. In accordance with the children's request one corner of the classroom was set off as a stage and used for a trial showing of the stencils. A rope was stretched from wall to wall and a sheet was hung from it. The same equipment used in the auditorium was brought to the classroom.

The first showings were highly successful. Then the entire class clamored for the opportunity to make additional stencils. Desks were pushed back against the walls and the classroom was turned into a workshop. Razor blades and handles were brought from home or bought from a five-and-ten-cent store. One boy discovered that his mother had an instrument called a pantograph for making enlarged reproductions of drawings and figures. Compasses, T-squares, and rulers suddenly were unearthed. Every child was involved in making a stencil of some architectural form. At first this activity was carried on without definite organization; each child worked out any form in which he was interested. Then the teacher arranged for a period when all the stencils could be assembled and discussed. At that time she pointed out that this hit-or-miss work might prove to be useless and that, if additional stencils were to be made, some logical plan would have to be followed. The

children then saw the necessity for this procedure and readily accepted the suggestion.

Next, a tentative program was built up. In order that each style of architecture should receive equal illustrative treatment, the class decided to provide stencils showing the outstanding development for each period. Then volunteers took over the work of cutting stencils for the different periods. One group interested in the architecture of the Greeks made stencils of Greek moldings, of the Parthenon, and of details and decorations found on typical Greek buildings. Similar work was done for each of the leading types of architecture.

The stencils of buildings to show the development of modern architecture were especially well done. One boy, who had evinced only passive interest in other manipulative activities, became intensely interested in this work and eventually assumed charge of the stencils illustrative of this period. He did meticulous work and produced many unusual patterns. Aside from his own work he inspired several of the boys to unite their efforts with his and they helped him develop a very complete display of modern buildings.

While cutting the stencils, the children worked on the floor either in groups or individually. Frequently, the teacher did not enter into the activity at all, but sat on the side lines observing the children and noting characteristics that were made manifest. She saw how the anti-social child gradually came to feel the need for asking help from his neighbor. She saw that the child who jumped to conclusions had to study his design in detail before he could cut his stencil. She saw that the impa-

tient child had to concentrate upon fine line and intricate details. She saw also that the garrulous, chatty girl had to control her conversation because her neighbors were too busy to be interested in it. She saw that the untidy and wasteful worker had to conserve both effort

THE SIXTH GRADE AT WORK CUTTING STENCILS FOR THE SHADOWGRAPH PICTURES.

and material. She saw that the timid, reticent child found satisfaction and inspiration in the quality of her design. All in all, these busy periods were excellent settings for the teacher to study behavior manifestations and to observe the evidences of conscious efforts in self-improvement.

As the plans for the program progressed the children raised questions about the motivation for showing these

shadow pictures. They recalled the subject-matter assembly of the preceding year and remembered that the previous class had used slides of architecturally important buildings to illustrate its reports. The second class wished to use slides also. The children suggested that the lantern could be used first to throw the picture on the sheet; then this could be extinguished and the details of the building could be shown in shadow relief.

The lantern was brought into the classroom and tried. It worked satisfactorily and met the requirements of the class. The children reorganized the program to provide for the showing of a lantern slide to precede, or preface, each group of shadow pictures. Since neither the slides of the buildings nor of the architectural details were self-explanatory, there was a real need for oral reports to accompany this presentation. The class was divided into small working groups. Each member of the group was held responsible for making a complete summary of the topic to which he had agreed to contribute. These summaries when finished were handed to the chairman of the group who conferred with the teacher in evaluating the written reports. Salient points were taken from each one. Where deficiencies occurred, additional material was added by the chairman before he again met with his group. This chairman took back to his group conference the criticisms and suggestions of the teacher and talked over plans for writing a unified report. This last report was written as a group activity and it represented the combined efforts of all the children in the group. Later, one member from each group was chosen to present the oral report to the assembly; the other members were

responsible for collecting and showing the slides and stencils. As in the case of the class of the previous year, those children who gave the oral reports used their written summaries only as outlines for the logical organization of their speeches. Memorization was discouraged except for dates, quotations, and titles.

An interesting contrast in individual differences is brought out by the two introductions to the content program which follow. The child who wrote Report A was a member of the first sixth grade group; the author of Report B belonged to the second group. Both were the same age when they wrote their reports and had had practically the same training throughout their school years. The entire reports are not given here for they were both quite long; however, from these opening paragraphs the reader can easily note the contrast in the material and in the children.

Report A

Introduction to the Content Assembly on a Unit of Work in the Sixth Grade

This year we thought it would be both useful and instructive to study the history and appreciation of architecture. It has been very interesting to find out how different peoples have expressed themselves through their architecture—how their environment has affected the types of their buildings.

Goethe said that "architecture is frozen music." He is quite right, for every nation expressed itself best through its architecture. Egypt's idea of beauty expressed itself best in its tombs and temples, which were of a colossal size. This shows that they took great care of the dead and thought that size and bulk were more beautiful than delicacy.

Ever since prehistoric times man has found need of shelter from the cold and the rain. The earliest shelters were caves formerly inhabited by animals. After many centuries man became semi-civilized and built rude huts out of mud, clay, straw or boughs. The African savages haven't advanced much further than this. But this wasn't real architecture. The first real architecture was produced by the Egyptians in the Valley of the Nile about 5000 B. C. They worked with slaves and erected tombs and temples of colossal size.

The next step was taken in about 650 B. C., by the Greeks. They erected temples of real beauty. These were symmetrical and the columns were of three orders, Doric, Ionic, and Corinthian. But the big difference between Greek and Egyptian architecture was that Greek buildings were erected by free people for their own use and Egyptian buildings were erected by slaves for the pleasure of a hard-to-please Pharaoh. . . .

Report B

Introduction to Shadowgraph Assembly

If you take a walk through the woods and know the names of all the birds and flowers you will have a much more interesting time than if you did not know the names of these birds and flowers. It is the same with architecture. If you know the types of architecture and the history of these different types, you will be much more interested in buildings than if you knew nothing about them. When you see a building which you think is very beautiful, you will appreciate it more if you know the style of the building. You may even think that it is more beautiful if you know the style and history of its architecture. Then too, if you know some of the principles about architecture they will help you to appreciate all buildings. . . .

In addition to the shadow pictures, the slides, and the accompanying explanations, the children felt that they

should supplement this rather academic program by introducing some original or interpretive motif. They did not want to present a play, for this had been done before. They wanted to introduce some novel feature never before shown in an assembly program. The range of possibilities was limited.

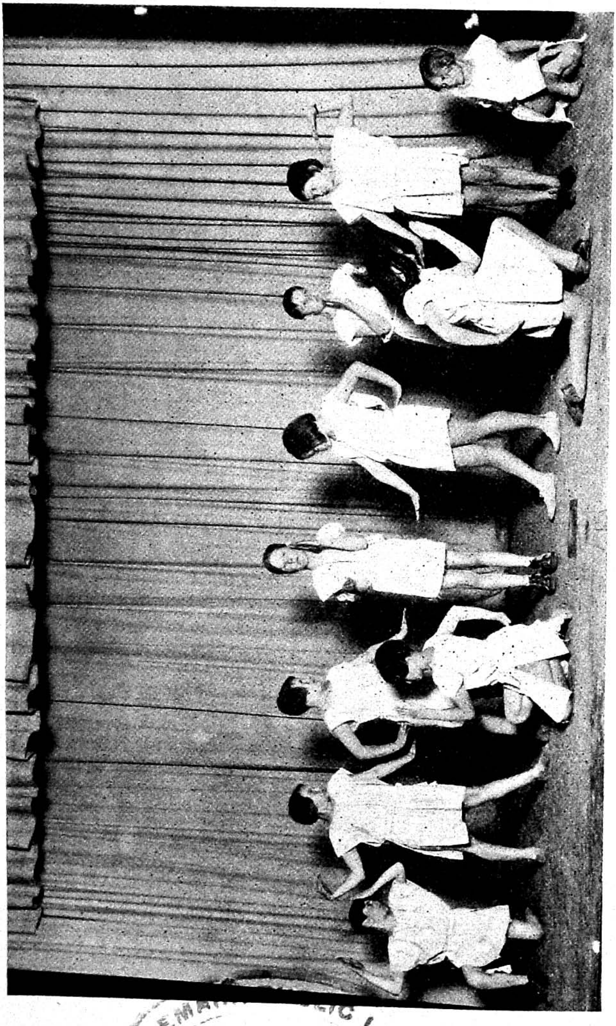
The class finally decided to present an interpretation of architecture by means of music and rhythmic dancing. The periods selected for this portrayal were the Egyptian, the Roman, the Gothic, and the Modern. Scenes from these interpretations are shown on pages 182-184.

The Egyptian interpretation presented a frieze of rigid figures as a background for an angular, formal dance taking place near the middle of the stage. The music for this interpretation was Rubinstein's "Egyptian" found in Himman's *Gymnastic Dancing*.

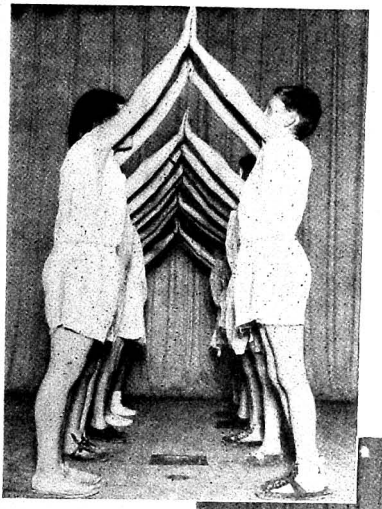
The Roman portrayal presented a gladiatorial combat in which two children took part. The music for this scene was "The Warrior's Song" by Stephen Heller, Opus 45, No. 5.

The Gothic presentation was interpreted by a group of children forming the outlines of arches, steeples, and vaulted roofs. The music used for this interpretation was Chopin's "Prelude in C Minor."

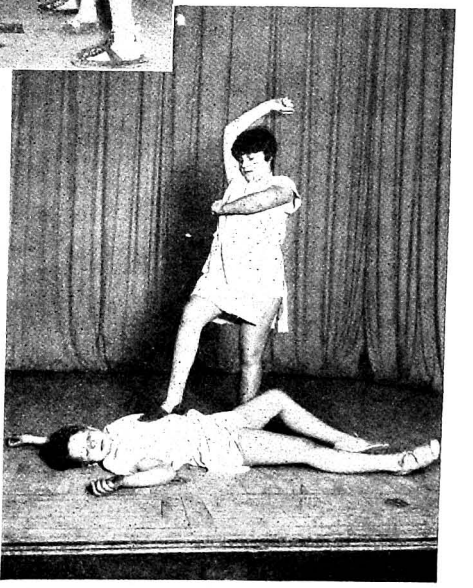
The theme chosen for the interpretation of the vigorous restlessness displayed in modern building was the "Bolero" by Maurice Ravel. This choice was particularly appropriate for besides the restlessness of the underlying theme, Ravel's composition is both rhythmic and monotonous—attributes common to modern industrial work. Four children participated in this portrayal, assuming the



THE CHILDREN'S INTERPRETATION OF THE SPIRIT OF EGYPTIAN ARCHITECTURE.



THE ARCHITECTURE OF THE GOTHIC PERIOD AND THE SPIRIT OF ROME INTERPRETED BY THE CHILDREN IN RHYTHMIC MOVEMENT.



EACH CHILD IN THIS GROUP PORTRAYED HIS OWN REACTIONS TO PRESENT-DAY ARCHITECTURE AS HE FELT IT.

positions and the activities of the steel worker and the riveter.

This part of the program was impressively spiritual for each participant felt an almost reverential awe for the ideals and spirit of the age which he interpreted.

IN THIS PICTURE THE CHILDREN ARE SEEN MAKING PROGRAM COVERS FOR ONE OF THEIR PLAYS. EACH OF THE PROCESSES IS ILLUSTRATED. THE BOY AT THE LEFT IS INKING A LINOLEUM BLOCK. THE TWO AT THE RIGHT ARE USING AN ORDINARY CLOTHES WRINGER AS A PRINTING PRESS. THE BOY IN THE CENTER IS INSPECTING THE FINISHED PRODUCT.

The costumes used for the entire assembly program were simple one-piece gray silk tunics worn over gray bathing suits. The children wore no stockings, but protected their feet by wearing their gymnasium sandals or shoes.

The printed program for the audience was novel. One of the boys had designed it on a sheet of 8½″ × 14″ drawing paper. On a flap appeared the general title of the program. This was the only lettering used. The rest of the sheet was divided off by lines into twelve sections. In ten of these appeared some identifying feature of the ten leading periods of architecture. The two additional spaces were left blank.[1]

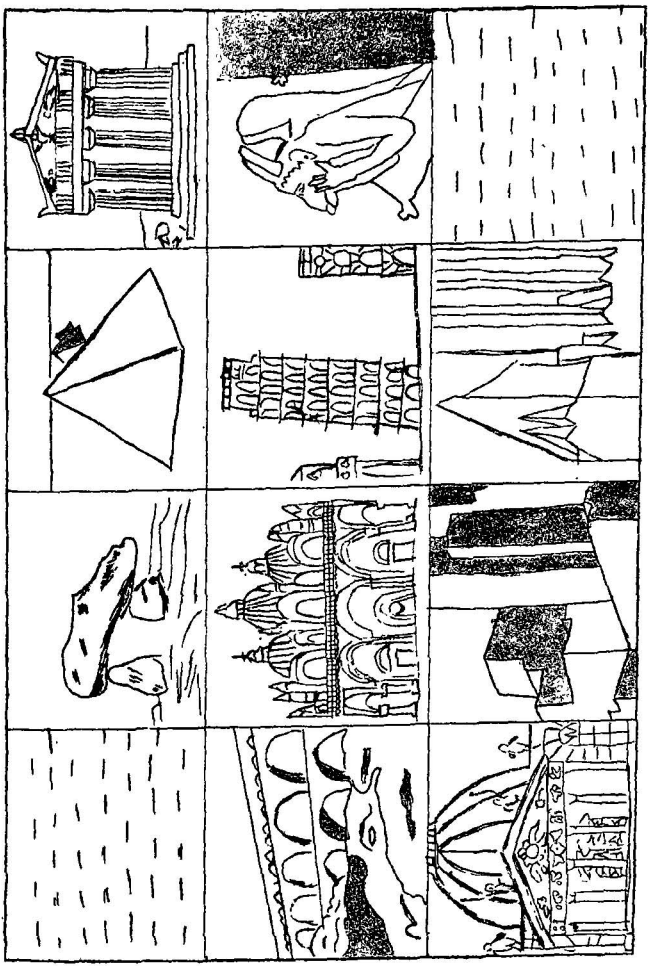
In her introduction one of the girls explained the absence of printing on the program and also the use for which the two blank spaces were intended. Her explanation of it follows:

> "The programs are for your use. We should like to have you try to identify each of the periods of the buildings after you have heard our talks. We have left two blank spaces. They represent something. Can you name them?
>
> "Bring your labelled programs to our room sometime today and we will tell you if you have answered correctly."

Not many of the children completed these programs correctly. Most of them failed to identify the blank spaces. One of the most satisfactory explanations designated the first blank space as the period "when gravity's pull sent a new world out from the sun," and the last space as the period in which "the sun fades out."

The entire presentation was spontaneous and sincere and not overly long. The novelty of the shadow picture interested the audience which was not bored by lengthy, inarticulate speeches about buildings or terms with which it was not familiar.

[1] A photograph of this program is reproduced on page 187.



THE CONTENT ASSEMBLY PROGRAM.

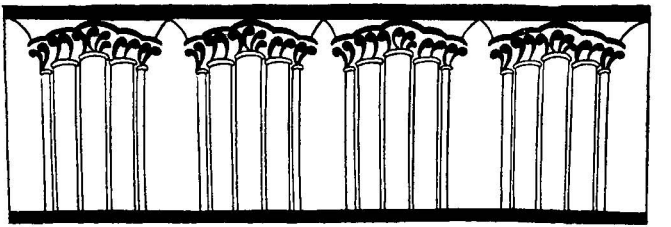
The activities described in the foregoing pages do not exhaust the possibilities for summarizing units of work. Any practicable media of expression in line with the interests and suggestions of the class may be effectively used. These usually are the outgrowths of the unit and fit the needs, the ability, and the initiative of the children. Dramatization in one form or another is a favorite agency. For one group, this may take the form of pantomime or tableaux with accompanying explanations of the scenes presented. Again it may be the dramatic interpretations of original verse or songs inspired by the unit of work. Large poster pictures showing the successive steps in the development of the theme of the unit may give direction to the summarizing activities. A class-made film or moving picture presenting the pictorial summary of the unit is a valuable and effective record of the class activities and the topics of study. Puppet shows, if appropriate to the theme of the unit, may be utilized to conclude a year's work or to present one phase of the study to other groups.

Sharing these summarizing activities with another class is not essential, but it is highly desirable. The audience situation stimulates the participants in the program and gives reason for the logical presentation of material.

Other activities of a more academic nature may serve as summarizing agencies equally as well as those of a more spectacular and elaborate nature. Notebooks composed of written and illustrative material presenting the topics of the unit of work are commonly used as synopses of the study. Other child-made books containing reports of readings and selected topics, accounts of excursions or observations, analyses of problems, descriptions of ex-

periments, and paraphrased or original stories and verse frequently are more suitable records of the work accomplished over an extended period of time.

No set rule can be laid down for the selection of media through which a summary may be most effectively made. The teacher and the children must decide this problem for themselves and they must select those means most suitable to their needs and purposes and most applicable to the equipment and the conditions of the school.



Chapter VII

THE USE OF CHARTS, GRAPHS, AND DIAGRAMS

A VARIETY of visual and illustrative aids were introduced in the classroom to facilitate the children's understanding of the principles involved in the development of world architecture. Some of these aids were so small in size that all the children could not see the printing and the illustrative material at the same time. So members of the class volunteered to reproduce these materials on a larger scale. Most of these reproductions consisted of duplicates of charts, graphs, or diagrams presenting outstanding periods and events in the story of architecture.

During a study period one day Margaret read in her reference book that "Under Pericles from 460 B.C. to 429 B.C. the old temples were rebuilt with greater splendor."

She was perplexed by the abbreviation *B.C.* which was placed after each date; consequently, she sought the

needed information from the teacher, who in turn called the attention of the class to Margaret's inquiry. The ensuing discussion showed that to many children the concept of time was vague. The abbreviation was known; almost every child could recite, parrot fashion, that B.C. meant "before Christ." Beyond this statement very little else was clearly understood. By grasping a real situation which demanded accurate information, the teacher was able to help the children gain a very necessary concept of time and a skill which functioned repeatedly in this unit of work.

A rough sketch was drawn on the blackboard to aid in the explanation of time. This sketch was only a straight line extending across the blackboard. About one-fifth of the distance from the right-hand end of the line the teacher placed a dot.

"That dot," she explained, "represents the time of Christ's birth. What year was it?"

A variety of answers—many of them guesses—were given, ranging from 1 A.D. to "the beginning of time in history." In order to clarify the matter the teacher continued questioning.

"If that dot represents the time of the birth of Christ, what would you call the years before that time?"

The correct answer was then readily given, for by means of this graphic line the deduction was obvious. Then, pointing to the remaining line, she asked, "What do we call *this* line?"

Only one or two children were able to contribute anything more than "after Christ." One boy, who had a speaking knowledge of several foreign languages, gave

PART OF A SCHOOL CORRIDOR DISPLAY WHICH INCLUDES ONE TYPE OF GRAPHIC CHART USED IN THE CLASSROOM

the correct answer and explained the derivation and the meaning of *Anno Domini*.

Exercise in reading this time line was provided through further questions, such as:

Where would you locate 10 A.D. on this line?

Where would you locate 1492 A.D.? 1776? 1930? etc.

Where would you find 10 B.C.? 400 B.C.? etc.

Some of the children were amazed to find that the number of the year was larger the farther it was located from the dot representing the time of Christ's birth.

"Did the people who lived before Christ count their years as we count them now?" was asked.

At this point was inserted the idea of the Hebrew calendar year. Some time was taken to discuss the reason for the omission of the birth of Christ in the Hebrew scheme of recording passing years.

Parallel with this activity was another of similar nature. Many reference books determined the era of architectural periods by centuries. One day the class discussion centered around the effort to locate on the time chart the second century B.C. There were very few children in the class who knew how to locate or to name the different centuries. In order to simplify the problem the teacher began with present time to develop the idea of marking and naming centuries.

"In what century are we living?" she asked. "Nineteenth," answered some children. "Twentieth," answered others. Each group laughed at the other, but both were confused by this disagreement on a point so simple.

The teacher then wrote the year on the blackboard.

Referring to the time chart, she asked one child to locate 1900 on the line. Another child found 2000 on this same line. Then the teacher indicated by a dot on this time line the location of 1930. This dot extended, of course, beyond the limit of 1900. By patient explanation the teacher showed that any date beyond 1900 belonged as a part of the following century. To illustrate this point she took the case of children's birthdays.

"When did you cease to be one year old?" she asked. "When we had passed our first birthday," was the answer. "Yes," the teacher continued, "the very minute that you passed the hour of your first birthday. What year were you in then?"

"Our second year," responded the group. "Were you two years old then?" was the following question. The children explained that they were only in their second year; they would not be two years old until they came to the second anniversary of the hour of their birth.

Referring back to the chart again, the teacher built up a parallel concept for the centuries. It was quite a simple transfer of ideas from the case of birthdays and ages to the case of centuries. The information was unanimously accepted after specific instances had been introduced to stabilize thinking. Drill was provided by subsequent use of the time chart and by continual reference to it whenever a date was quoted or a century was mentioned.

This time line was a temporary device and disappeared with the washing of the blackboard that afternoon. In order to provide a time graph of permanent value the children constructed one of cardboard and tacked it to the wall above the side bulletin board. It was drawn

to scale and indicated the division of centuries into B.C. and A.D. Each century was marked off and numbered. Each segment between the century lines meant ten years, so ten segments were ruled off to mark the century division lines.

This chart was used repeatedly as the study of this unit progressed. If any especially important date was given in discussion or in reference reading, it was noted below the graph in its exact time position. Small library cards were used for recording these events in their relative positions. Samples of these notations are given here to show the types of data selected.

GREEK ARCHITECTURE

From 460 B. C. to 429 B. C. the old (Greek) temples were rebuilt with great splendor. This was the Golden Age of Greek art, both in architecture and in the sister art of sculpture.

Reference—Barstow, *Famous Buildings*, p. 32.[1]

THE PARTHENON

The Parthenon is one of the most famous Greek buildings. It was placed on the Acropolis in Athens. It was built about 454-438 B. C.

Reference—Fletcher, *The History of Architecture*.[2]

[1] Barstow, Charles L. *Famous Buildings*, New York, The Century Co., 1915.

[2] Fletcher, Sir Bannister. *The History of Architecture*. New York, Charles Scribner's Sons, 1929.

MONOLITHS

Cleopatra's Needle was built in 1500 B. C. at Heliopolis.
Reference—Fletcher, *The History of Architecture*,[1] p. 36.

Louis seemed greatly absorbed in this class-made record of the passage of time. He had contributed many cards of information to the time chart. One day he brought to the teacher's attention a line graph which he found in one of his reference books. He thought that it was particularly pertinent and that it would be helpful to the majority of the class. This graph was a full page chart but, even so, it was too small for practical purposes. Timidly, he suggested that he might reproduce this graph on a larger scale and in such form as to be of use to the entire class. The class gladly encouraged him to carry out this activity. He talked over his proposed plan and together they decided what materials were needed to make the graph.

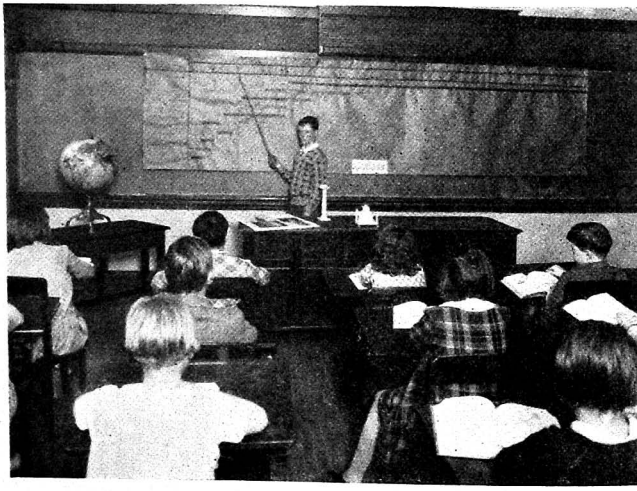
A large sheet of heavy wrapping paper, measuring about three and a half or four yards in length, was brought from the supply room. He set to work diligently to determine the scale to which he would draw the graph. He first measured the full length of the paper. Then, using the reference book, he counted the number of cen-

[1] Fletcher, Sir Bannister. *The History of Architecture*. New York, Charles Scribner's Sons, 1929.

turies represented in the graph. With these requisites he computed the scale for drawing the graph. Each 8½" represented a period of one thousand years. The duration of the great periods of architecture were represented by heavy black lines. The graph in the book showed shaded lines to represent the beginnings and the wanings of these different periods. How was Louis to represent these lines and shadings on such a large chart? First he tried to use India ink and a drawing pen; but the lines made were too narrow for the purposes of the graph. India ink, however, was the best medium for lettering the chart. Louis next tried to draw his line graph with black crayon, but the wrapping paper did not take the crayon well. The use of crayon offered another problem in that the lines could not easily be shaded.

Finally, Louis had to abandon all his previous plans. Some more satisfactory medium to draw the lines of the graph would have to be found. Black gummed tape and black mending tape were suggested. Gummed tape was first used. Strips were cut to represent the duration of time over which each period extended. When all these strips were in place, the graph was rolled and put in the supply closet to be finished at a later time. But when it was unrolled, it was discovered that the tape had cracked and torn away from the paper. Louis tried to make it adhere, but the harder he worked the less successful he was. Then the mending tape was suggested and an order was given for buying the necessary amount. The actual buying was postponed for a day or two by school exigencies. In the meantime Louis himself had done some investigating and had concluded that the diffi-

culty was not so hopeless as it had seemed. Before the new material was ordered he found that the tape which he had used had been in the supply room for some time. Over-exposure had dried the glue and therefore had made the tape useless for this purpose. An order was then placed for *fresh* tape. When this arrived, it was measured



LOUIS EXPLAINS HIS TIME LINE TO THE CLASS.

and applied in much the same way as the first tape had been. This later effort was successful, for the glue stuck.

To indicate the beginnings and the declines of periods, Louis used short lines of white ink drawn over the black tape. This gave a shaded effect. When the notations and the scale of the drawing were added, the chart was complete. It was hung on the wall above the front black-

board and served as a handy reference whenever it was desirable to see the relation between architectural periods.

This individual effort stirred the ambition of several other children and they made small graphs for their notebooks. A committee listed references and facts for time charts on large library cards which were posted above one of the bulletin boards. Thus anyone needing this information could save time in finding it. Samples of this kind of notice follow:

TIME CHART

Gardner, *Art Through the Ages*, p. 477.
Brown, *The Young Architect*, p. xix.

DIVISIONS OF HISTORY

Ancient History: 5000 B. C. to 476 A. D.
Medieval History: 476 A. D. to 1453 A. D.
Modern History: 1453 A. D. to Present Time.

DETERMINING EVENTS

Fall of Rome 476 A. D.
Fall of Constantinople 1453 A. D.

In the forepart of Fletcher's *The History of Architecture,* there is printed a particularly graphic chart called The Tree of Architecture. Six great roots represent the environmental influences (geographic, economic, political, etc.) which nourished and were responsible for the great periods of architecture. The trunk of the tree is divided

horizontally into three segments each representing a period of original architecture. Reading it, the child sees that this author attributes originality of design to ancient Greece, to Rome and to our present-day world. Branches growing from the trunk at these points represent the eclectic schools (Romanesque, Renaissance, etc.) which grew out of original architectural contributions.

Most of the children were fascinated by this pictorial representation. It was so clear and definite that very little additional explanation was needed. Consequently, it is not surprising that many children copied this diagram and used it as a part of their personal notebooks. They made an enlarged copy of it on a full-sized piece of oak tag paper and hung it in a conspicuous place in the classroom, where all might use it as a reference diagram. To the children it was another medium for visualizing the historical background of this unit of work. Its use helped the children to clarify the general concept of the evolution of human accomplishment. These simple visual means seemed to be more effective than many reference readings in adding to the pupils' fund of knowledge.

The children frequently found the names of famous artists, architects, and patrons of art in their reading materials in reference books. One of the girls said that she was making a special section in her notebook to record these names and some of the outstanding facts about each one. This inspired several of the other children to do likewise. The data compiled in these lists were needed quite frequently when discussions centered around the works of individual architects.

During such a discussion period, one of the boys suggested that a class record of these well-known architects and artists would be very useful to the class. He recalled the number of times that the children had felt the need of knowing something about the lives of these men. The class agreed with his suggestion. They decided to make note of the names of each famous architect and artist who was mentioned in their readings or in their discussion periods and to include the names of famous patrons of art.

The chart was made of heavy cardboard and was called Who's Who in the History of Architecture. The cardboard was ruled in eight columns of equal width. Each column represented a period of architecture and was labeled according to a chronological classification: Egyptian, Greek, Roman, Byzantine, Romanesque, Gothic, Renaissance, Modern. In these columns, under the proper headings the children wrote the names of persons for whom they had biographical data. If the name was that of an architect, a circle was placed before his name, thus distinguishing him from the others. A paragraph describing the outstanding events or contributions for each person was written on separate papers and hung on the bulletin board near the chart. Each paper was labeled with a Roman numeral corresponding to the heading of the column on the chart. These numerals identified the period of architecture with which the personage was associated. The records were taken from some reputable source and the reference was noted at the conclusion of the article. So, little by little, a biographical dictionary of art was built up.

The following notes, copied from this record, are indicative of the items included on the chart:

IV

JUSTINIAN I

438-565 A.D.

Justinian was born in 438 A.D. His name was originally Upranda which he changed to Justinian. At an early age he went to Constantinople where he received a careful education. In 527 he was crowned Emperor of Byzantium. His reign was the most brilliant in the history of the late Empire.

Justinian was a great builder of aqueducts, fortresses, churches (St. Sophia), quays, and monasteries.

Reference: *The New International Encyclopedia.* Vol. 13, p. 53, Dodd, Mead and Co., N. Y. C.

VIII

LOUIS SULLIVAN

A Contemporary

Sullivan "clothed a few of the earliest steel-frame structures in honestly architectural expressiveness thirty years ago."

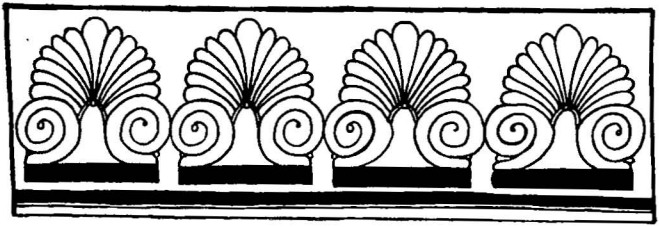
Sullivan decided that a building which stood up because it had a steel frame should not look as though it were held up by stone walls. He also decided that a building intended to be used for business purposes and equipped with all kinds of devices to make such uses efficient had better look like a machine than like a temple.

Reference: *The New York Times Book Review.* November 30, 1930.

In addition to these charts and diagrams, prepared for general use, individual children found in textbooks, ref-

erence books, commercial pamphlets, or periodicals simple graphs of interest and specific information. These usually were included in their notebooks. Whenever similar visual materials were found, they were presented and explained to the class. If the children thought that the material was of general value, they asked the donor to make a large sketch of the diagram for classroom use. If, on the other hand, the children thought that such charts would not be helpful generally, the donor used them for his own specific needs. The latter occurred most often when the material dealt with a particular topic of interest. For instance, one child, whose problem was concerned with certain modern buildings in New York City, found a diagram comparing and contrasting the elements in the newest buildings. He showed this to the other members of the class who enjoyed looking at the chart, but who decided that its interpretation was helpful only to Jim in solving his problem and that it would not contribute any necessary information for class use.

Most of these visual materials were used as references or as means of clarifying and organizing the mass of material contributing to this unit. They were especially helpful to children when making oral reports to the class. They referred to them in locating dates, in tracing chronological developments, or in making comparative analyses of different periods of architectural development. They presented graphically many definite evidences, which otherwise would have been more difficult to present or would have required a lengthy report to explain satisfactorily.



Chapter VIII

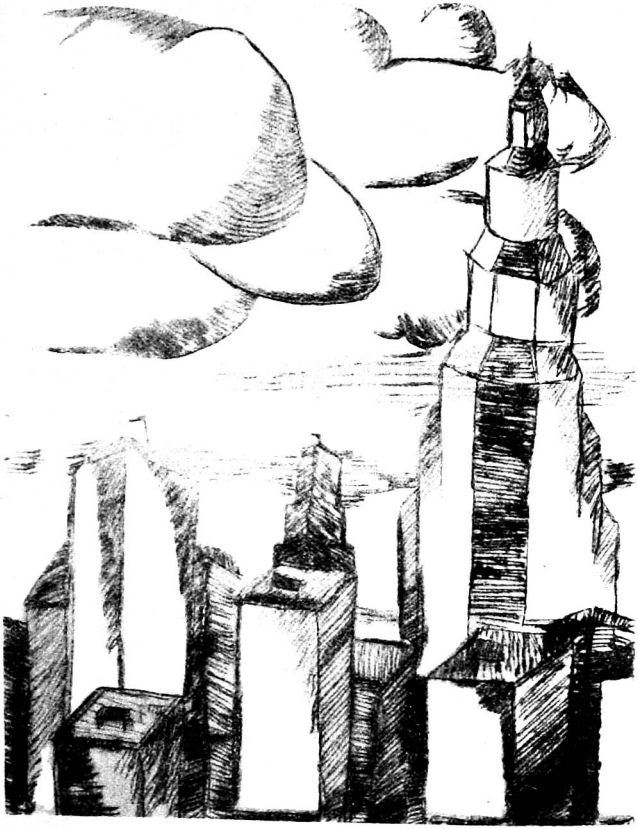
EVIDENCES OF A CARRY-OVER OF INTERESTS

THE teacher tried in every possible way to foster individual purposes and interests beyond the general interests and activities of the class group. In time most of these purposes became a part of the class plan and acted as contributing agencies. However, there were many instances of children carrying through an independent plan which, though sponsored by class enthusiasm, was individually assumed. In addition to the carry-over from the group to the individual there were also continuing individual interests held over beyond the year spent in the sixth grade. Evidences of this carry-over were brought to the teacher's attention time and time again and gave her added impetus to enrich the succeeding year's plan beyond that which had gone before.

Each year found former pupils returning to the sixth grade room "just to find out what is going on" or "to see what new developments are being carried on by this year's class." This interest was genuine and spontaneous.

Groups of two or three Junior High School pupils stopped in the room at the luncheon period or after school to make inquiries about the progress of the unit or to talk about similar experiences which they had had in this grade. Frequently a prized picture or illustration was lent by one of these former pupils, so that the present sixth grade might have the benefits to be derived from studying it. Notebooks or picture collections made by former groups often stimulated a new interest or served to answer important questions. One child brought a catalogue of illustrative material which she thought might "help out a bit."

One boy carried over as a hobby the study of etching which had been initiated in connection with the study of architecture. While in the sixth grade he was one of a committee chosen to make the design for the program of the class play. He had insisted upon making a wood block design which would give the effect of soft lines and shading rather than the broad harsh lines of the ordinary linoleum block. The Art teacher explained that such effects could be obtained only from an etching. She explained to him how an etching was made. He, being naturally artistic, was anxious to try to make such a plate. The process is difficult and requires quite a degree of skill, so the teacher was hesitant about encouraging the activity. However, his earnest insistence won her over to his purposes. When a note of consent to this activity was received from his father she made plans to provide individual instruction for him. The school did not own the necessary tools for such work so the coöperation of the



AN ETCHING MADE BY ONE OF THE SIXTH GRADE CHILDREN WHICH ILLUSTRATES THE CARRY-OVER OF INTEREST IN THE UNIT OF WORK INTO AN OUTSIDE ACTIVITY.

Art Department of Teachers College was sought. The Art teacher took the boy to one of the college instructors who showed him the fundamental principles of etching and gave him enough help to start his project. Then the Art teacher took over his instruction. In the meantime, the boy had bought his own tools and was concentrating upon this interest. He saw that his plan for the program design would have to be discarded, for to make such a quantity of etched copies was not practical. He joined with the group to make a wood block design, but he continued to work on his individual product whenever he had the time. Eventually the plate was finished and prints of the etchings were made. Inspired by his success he wanted to know more about etching; he experimented with making a dry-point etching after he had found the following definitions:

"Dry-point means the use of a needle directly on the bare copper or zinc unprotected by any ground.

"Lines are scratched on; no acid bath is necessary. As the needle digs furrows in the plate, it throws up a ridge of metal on the side, technically known as 'burr.' This 'burr' gives the rich black velvety characteristics.

"The plate yields only a small number of impressions because the 'burr' is crushed."

A "DRY-POINT"

"The 'Dry-point' is so called because no bath of acid is needed. A tapering pointed instrument of steel is used for scratching the design on the plate. With one of these tools the dry-point engravers work on zinc or copper plates, ploughing up a line. When the plate is inked it is then rubbed off with a rag lightly, so that some of the ink will stay in the lines and burrs. Before printing, it is necessary to moisten a piece of

etching paper. It is then put through the roller so that the moistened paper will be pressed into the lines and make a rich, soft and velvety effect which is the outstanding characteristic of the 'dry-point.'"

The following year he continued to make etchings in his after-school time. He made and printed his own Christmas etching for succeeding years. His mother reported that his interest has never lagged; if anything it has increased. He is now in Junior High School and claims that etching is to be his life work.

Another girl who left the school to move to another city before the end of the sixth grade, has continued her interest in buildings. A recent letter from her father tells of her activity in studying the principles of architecture during every possible free moment. He says that she has become quite an authority upon the subject. She plans trips to every new or outstanding building in her vicinity and always manages to confer with the workmen or architect in charge of the construction. Her pleasure-reading is supplied through textbooks or recent publications on the subject of architecture. Her aim is to build a complete library of books dealing with this subject.

The two foregoing cases of a carry-over of interest are unusual and outstanding, but they show to what an extent this interest may influence future activity. Many, many strong tendencies were built in the present class which undoubtedly will continue to function for years to come.

Intellectual curiosity is a valuable asset to cultivate at this age, for it strengthens careful judgment and analy-

sis of cause and effect. It also sponsors more accurate thinking and reasoning when trying to weigh values. The *Why* questions in connection with different aspects of this study stimulated many investigative activities. One of these activities grew from the study of architectural details and symbolic ornamentation already referred to in Chapter IV. Labels from commodities in everyday use excited the children to ask: Why is this trade-mark used? What does this figure symbolize? Is the symbol appropriate to the purpose of this article? Many of the devices were self-evident, but a few required interpretation.

Several of the children voluntarily wrote letters to some of the companies manufacturing the articles asking them to explain the use of these symbols or trade-marks.

A letter was written to a railroad company by one of the boys to ask for definite information about their use of the keystone as an emblem.

DEAR SIRS:

Our class is greatly interested in the story of architecture. The other day while we were talking of arches and keystones I remembered that your symbol is a keystone. I am very curious about its original significance and why the Pennsylvania Railroad has selected it as their symbol. Can you tell me also why this particular shaped keystone is used.

If I may have this information, it will be very valuable to our class. Thanking you for this courtesy, I am,

Very truly yours,

The reply to this letter was received promptly. The children were pleased with the response and felt that it had answered their questions satisfactorily. The body of the letter read:

Replying to your inquiry of November 6th, I enclose herewith copy of our time table showing the keystone monogram we used in much of our advertising matter.

As Pennsylvania was the Keystone State in the original thirteen states, and has been known ever since as the Keystone State, it was only natural that the Pennsylvania Railroad, named for the Keystone State, should adopt the keystone as its emblem or trademark.

This particular shaped Keystone was adopted, everything considered, as being the best for our purpose.

Another child, curious about the meaning of a device printed on a label, wrote the following letter to a company which prepares canned soups:

DEAR SIRS:

I am a pupil of the Sixth Grade of the Lincoln School. Our class is trying to find the meanings of trade marks and symbols. In looking for examples I found yours on one of the cans in Mother's cupboard. I would like to know where you got the trade mark that you use on your cans. And will you please tell me why you use the —— Kid to advertise your soup?

Yours sincerely,

_____

In a few days, she received a reply (part of which is quoted) and read it to the class during a discussion of trade-marks and symbols.

Around 1898 it was felt that the labels of the —— Company could be given a greater color appeal. The Treasurer of the organization saw a magazine cover which impressed him with the strong color value of red and white, and out of this observation the present Red and White —— Label was developed.

The word —— as it appears on the can label is modeled after the signature of ——, at one time President of the Company. The medal on the can was presented at the National Exposition in 1900. . . .

Some years ago it was decided that some method should be employed in our advertising to show that beneficial effects upon the health derived from including —— Soups in the daily diet. To this end, the chubby, gleeful —— Kids featured most successfully in our national advertising.

The next letter, written to a company which makes cigarettes, is significant not alone for the inquiry but also for the activities initiated following the reply to the note.

DEAR SIRS:

The Sixth Grade of the Lincoln School is studying symbols. On the package of cigarettes that you put out, there is a picture of a camel and pyramids in the background.

We would like to know if that is your symbol and if the use of a camel has any significance.

Sincerely yours,

_____

The answer to this letter precipitated lively arguments. It explained that the camel and pyramids were the pictorial explanation of the trade name for the product but that they had no further significance. The children felt that there should have been a meaning attached to this trade-mark explaining why this product was so named. Camels and pyramids were far removed from cigarettes, they argued; so if these were used to designate a product of the company there should be some subtle connection between the trade-mark and the product. The children went so far as to make their own interpretations of the trade-mark, and it was not without a great deal of teacher

influence that they were deterred from sending these interpretations to the tobacco company.

This incident caused many of the class to be more alert in analyzing symbols or trade-marks. One of the boys extended his interest in these devices beyond the time devoted to this study in the classroom. During the entire year he collected samples of trade-marks and symbols which he later used to make a scrap book. This book was not merely a collection of devices, for he included also written interpretations of their meanings. Many of these were verified by letters from the companies using them, or through personal questioning of some member of the organization. He was delighted to find during the year a book issued by a reputable publishing house which was organized on the same plan as his scrap book. This particular collecting tendency is very strong with the majority of children, but often there is little purpose beyond mere classifying and organizing the collection. In this case, however, there was intellectual curiosity which had been inspired by a purpose and a need for seeking meanings.

One of the aims of a socialized classroom situation is to develop group consciousness. Sharing property, being mindful of the needs and purposes of others, and coöperating helpfully are manifestations of that consciousness. In the modern school the teacher finds innumerable opportunities for fostering and developing this spirit. The following instances reveal the extent to which group consciousness was practiced in this particular classroom while the unit was in progress.

The period before the opening of school in the morning was generally one of commotion and agitation. Children came to the classroom armed with books, magazines, newspapers, or illustrative materials relative to the story of architecture. Typical remarks heralding the exchange of these materials were of such nature as the following:

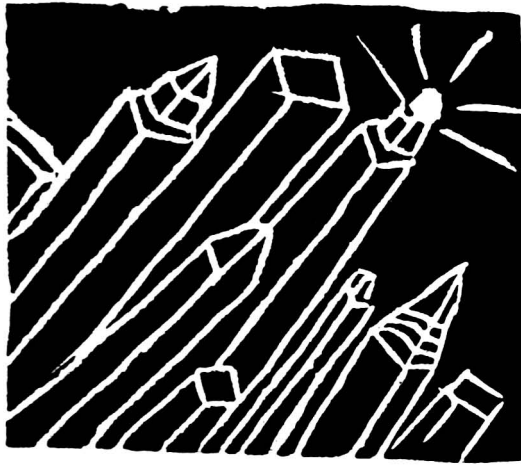
"Who is gathering facts about Frank Lloyd Wright? Here's a report of his conference with the World Exposition Committee." Or, "Carl, here's an article written by a New York architect telling how he is planning to use colored glass in a new building." Or, "I found this picture of a modern German department store which shows how modern architecture is spreading in Europe. Could you use it, Helen?"

A girl whose father is a publisher of commercial advertising, brought photographs, sketches, and diagrams of present-day construction which were of great value to those who were studying modern architecture. In addition, she brought enough explanatory pamphlets about the new Empire State Building to supply each child.

Evidences of individual interests occurred daily in the classroom. A carry-over of architectural motifs in the fine arts and in industrial arts was frequently brought to notice. For instance, several children used architectural forms or details for their Christmas cards. One boy designed, cut, and printed his own bookplate using (as shown in the illustration on page 214) a conventional adaptation of the city's skyscrapers for his design.

Another boy developed a high degree of proficiency in photography by taking from his bedroom window numer-

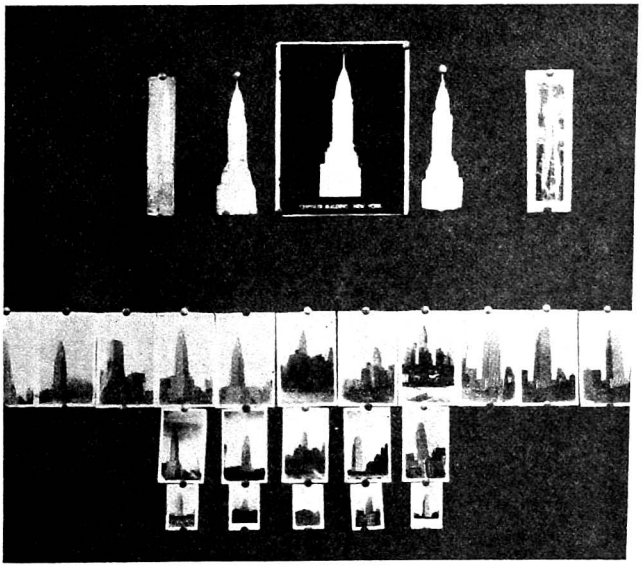
ous snapshots of skyscrapers. He really tried to get most unusual effects in following this hobby. Some of his pictures are as interesting as are the ones used in commercial notices and advertising. He brought to school copies of all these snapshots and arranged them on one of the bulletin boards for the class to enjoy. His special



A BOOKPLATE DESIGNED, CUT, AND PRINTED BY ONE OF THE CHILDREN.

interest was the Chrysler Building and the News Building which were plainly visible from his apartment. The children became so interested in this activity that they kept him busy supplying their demands for prints of his snapshots. He carried on quite an extensive and profitable business during the remainder of the year. Other children were stimulated to engage in the same activity,

thereby offering commercial competition to this originator of the plan. However, there was a sufficient number of demands to extend the activities of all those in the group interested in carrying on such work.



A BULLETIN BOARD DISPLAY OF ARCHITECTURAL PHOTOGRAPHS TAKEN BY ONE BOY IN THE CLASS. MODERN ARCHITECTURE WAS HIS HOBBY.

The discussion of modern architecture in New York City brought out a consideration of those factors and laws which modify and control the construction of city buildings. One of the recently enacted laws is concerned with "setbacks." This law was the subject for animated

discussion in this class and the interest was carried far beyond expectations.

Robin felt that the class information was incomplete unless the children gave consideration to the period antedating "setbacks." He searched out several articles from current publications and pamphlets and later compiled his facts in the following report. This work was done as an individual enterprise and was prepared without any idea of a class assignment.

Height of Buildings Before Setbacks

Buildings in Manhattan are set back from the street at certain heights so as to get more sunlight on the streets and in the windows and to lessen fire risks. Buildings put up before July, 1916, had no setbacks because the first law was passed then.

Business buildings are under different rules according to the parts of town. The city is divided into six zones. In some of the zones business buildings may go up one and a quarter times the width of the street, in others one and one half, in others twice the width, before the first setback. For instance on Fifth Avenue from about 40th to 50th Streets the width is about a hundred feet and in that particular place the buildings can go one and a quarter times the width, so the buildings will be one hundred and twenty-five feet high before a setback. On Broadway the buildings can be as high as twice the width of the street. Various setbacks are required according to the size of the building. The amount of the setback is up to the architect, the smallest amount being four feet. One fourth of the area may be used for a tower going up as high as the architect likes.

Apartment houses put up since the passing of the Multiple Dwellings Law last spring may go up one and a half times the width of the street. If the house fronts on two streets

they count by the wider street. Most cross streets are sixty feet wide so houses fronting them may go up ninety feet before setback, or nine stories, counting as usual ten feet to the story. The law supposes that no street is more than one hundred feet wide though some of them are; that is, no apartment house may go up more than one hundred and fifty feet or fifteen stories before setback. I think this rule also applied to apartment houses built between 1916 and 1929, but apartment hotels where no cooking was done were allowed to go higher.

Under the new law the total height of an apartment house may not be more than thirteen fourths times the width of the street plus three feet plus twelve feet for a penthouse. On certain very large lots a tower can go higher still but cannot take up more than a quarter of the area.

The new law says that transient hotels can go up as high as they want to so long as there is no other residence building in the block from which they crowd off the sunlight.

One of the girls left school before the end of the semester to go to Europe. She wrote letters to the class from different continental cities and sent many photographs and snapshots of interesting places that she visited. Many of these were attached to the letters which we received. The text of one of these letters is here reproduced and shows how the study of architecture gave meaning to this European tour.

Frankfurt-am-Main
Germany

DEAR CLASS:

These are the promised Notre Dame pictures. Number I to the left is the door-way and some of the carvings. In number II I tried to make a general view of the church but my camera slipped or somebody jossled me and a piece is left off.

The balcony between the two steeples is sort of a lookout

post so you get a wonderful view. (I am sorry that there were no people up there when I took the picture!)

Number I on the left of this page is the Dome of Les Invalides in Paris. Inside there are the tombs of Napoleon and his wife.

Number II is an old monastery. Now it is used for a boarding house, but formerly the monks used to walk all the way around the sort of archway to get to the chapel. It is very, very old Gothic architecture. There is a great deal of old Gothic in the "Alstadt," which means the "old city" of Frankfurt.

Many of the roofs of Frankfurt are made of slate and have those dormer windows! Here are some views of Frankfurt.

Number I on the left is the "Dom." The Dom (pronounced Dome) is the largest church in Frankfurt. Do you see that balcony way at the top, above the clock? We walked all the way up; four hundred and five steps or something like that! Oh, my legs hurt for a week; four hundred and five steps!

When we were up at the top the clock struck half past four, and oh, were those chimes loud? I'm deaf!

Number II is the Römer, where the old Kaisers were crowned. In the coronation salle you have to wear slippers, like these [*sketch*] over your shoes and you slide around in them. It is too funny to see dignified old ladies go tripping along. On the balcony the Kaisers, after the coronation, would step out to bless the people and swear loyalty to the multitudes below. There is a fountain [in] the square below the balcony and at the time of a coronation it flowed red and white wine. The people would massacre whole oxen for refreshment.

It is very queer in some of the old streets in the Alstadt. The houses go together at the top like this [*sketch*] while at the bottom a broad street can run through.

I could write forever, but I vaguely suspect that this architectural document is long enough and I shall sign off soon.

Who is Lorenzo Ghiberti in the play? Has the play been played and the assembly given?

I hope that some of you will have time to write me.

With love,

Many children were stimulated by this unit of study to plan individual excursions to different places of interest. That they should visit museums or exhibits was to be more or less anticipated; but to plan to visit distant libraries or bookshops to find reference books was beyond expectations. The following account was written by a girl who had voluntarily taken such a trip:

Last Friday I went to the Public Library to visit the art and architectural room and to find the names of books about architecture.

First I looked up books dealing with my chosen problems such as Gothic, Byzantine, Roman, etc., architecture.

Next I looked up books which I thought might give information about our class problems such as Tuscan Doors, Corinthian Windows, Pointed Arches, etc.

Then I looked up books on symbols and found "Ancient Pagan Symbols" by Goldsmith which I think should be added to our classroom library. I also looked up "Modern Architecture" and to my disappointment found the book was only pictures of an imaginative futuristic city.

From the library I went to Putnam's bookstore and bought "Ancient Pagan Symbols" and "Adeline's Art Dictionary" which I brought to school for our use.

I suggest that the library get "Ancient Pagan Symbols" and "The Builders Jewels and Treasures."

Some books that I read were over my head so I couldn't understand them.

Living in a city so filled with types of modern architecture the children were easily interested in some of the

outstanding buildings. The Chrysler Building, the News Building, the Empire State Building (not then completed) were some of those discussed. Traffic congestion and the impracticability of excursions to these buildings prevented the entire class from visiting them. However, individual children, accompanied by parents or other adults, took trips to each of these buildings. Class discussions of these excursions were based upon pupil reports, photographs, magazine illustrations, and clippings brought for the class bulletin board. Those children who visited any buildings during out-of-school hours made reports to the class about their observations. They endeavored to bring information that would answer questions or settle disputes arising in the classroom. Many interesting discussions arose from an attempt to classify modern buildings in terms of the architecture of the past. For instance, in talking about the Chrysler Building an animated discussion arose from the consideration of the fitness of the tower to the rest of the building. In the opinion of the class it was most inappropriate and unbalanced. Why was it put there? Was it only an afterthought of the architect? The cupola itself is evidently of Gothic origin, but the spire resembles a lightning rod which was not in use or even known at the time of the great Gothic era. This architectural anachronism led to an investigation of the reasons for using this lance-like spire. Current periodicals solved the problem. Reading from them, the children learned that "big business" and commercial rivalry were responsible for the use of this spire. A neighboring building was being erected to a height that would challenge the boasts of the builders of

the Chrysler Building. This latter building was advertised as the tallest building in the city. When the rival building was completed it was taller than the Chrysler Building. Then it was that the architect of the Chrysler Building shot up the spire which reached beyond the height of any other building in the city. Was this fair? asked the children. Was it not making use of a technicality of law which in itself was impracticable? Was not height in such cases measured by habitable space? No one could occupy the spire; it was merely a visual extension. Magazines, pamphlets, and clipping files were consulted. One child found a graph showing the actual heights of the tallest buildings in the world. This graph had been prepared by a noted Japanese student of architecture. He assumed the same thesis as that held by the class. In his graph the Chrysler spire was ruled out in measuring height; therefore the rival building was shown to be several floors higher. To be upheld by the opinion of such an authority was supreme satisfaction to the class and justifiable reward for their efforts.

One boy whose enthusiasm for modern architecture was greater than his classmates' even undertook to design a more appropriate tower as a substitute for that which had caused so much discussion.

One of the queries arising during the study had to do with the material used in the tower of the Chrysler Building. Obviously it was a metal; but unlike metals known to the class, this did not show the effect of weather or exposure. It seemed never to corrode, rust, nor tarnish. Its gleam was almost opalescent; from a distance it looked like stained glass.

Investigation and experimentation brought no satisfaction, for nothing could be found that would solve the problem. Eventually the interest of an adult was enlisted. Through her efforts the children learned that the material was produced from an original formula which was the inventor's secret. Suffice for us to know that it was a composition resisting the effects of the elements and the wear of years of exposure. This knowledge was satisfactory because it answered the questions though it did not add much to the fund of information. A short time later a current magazine published an article dealing with this topic. The author of the article told about the lasting qualities of this metal and its practicability for building purposes. From this article the class found the name of the metal—*Enduro*—and many important facts about its uses.

A growing interest in the construction process of the Empire State Building directed class interest into an unusual channel. On the summit was to be erected a mooring mast for dirigibles. Was this practical? Being somewhat skeptical the children asked, Is this another advertising scheme? Several of them visited the new building and talked with the man in charge of the construction. They reported to the class that the mast was built for use and not for advertising the new building.

One morning during the discussion period, a clipping was introduced which stated that this mast would not be used for at least three years after the building was completed. The reason given was that dirigible construction had not advanced to the point of efficiency required for

such a landing. Every newspaper or magazine giving any information about this topic was brought to school for further reading and study. Cartoons and printed stories about the mooring mast or other structural details were brought to the class.

This building continued to be a source of ever interesting possibilities. The children found many photographs, sketches, and details of information about this new wonder. One of the boys found, in a magazine, a chart giving statistical tables about the size, materials, costs, and conveniences of the building. He brought this report to school and presented the figures to the class. The children were so greatly interested in it that many of them asked to make copies of it for their notebooks. The teacher suggested that they might be spared the tedious copying of the report if mimeographed copies were made when each child could have a full copy of the details for his own notebook. This suggestion was followed, and an extra copy was made for a class chart of information about the Empire State Building.

About this time a local textile manufacturer presented to the silk market a special printed silk crêpe dotted with conventionalized designs of this building. Another boy, finding that his mother had secured samples of this material, brought them to school and posted them on the class chart.

The girl already mentioned who, through her father, had supplied the class with so much information on the building, later procured through him a large model of it. This model was the height of the classroom and showed plainly many of the details for which the children had

looked. It proved to be a veritable gold mine of information. The children were so proud of it that they invited all the classes in the elementary group to come to their classroom to see it. This model was also given a conspicuous place in the class assembly program which was presented in the late spring.

Before the end of the year the Empire State Building had been completed and was open for inspection. Most of the children visited it during out-of-school periods. Those who could not make the trip at the time said that they would visit the building during vacation. The curiosity of this latter group was aroused by the reports of the children who had visited the tower and had seen the mooring mast.

After some time had been spent in discussing and experimenting with geometric forms Mary wrote the following summary of this activity. The idea and the task were self-initiated; no one knew that she was writing it until she presented it to the class.

THE TRIANGLE

The triangle is a three-sided figure and is the strongest of all geometric forms. All the sides of a triangle press against each other.

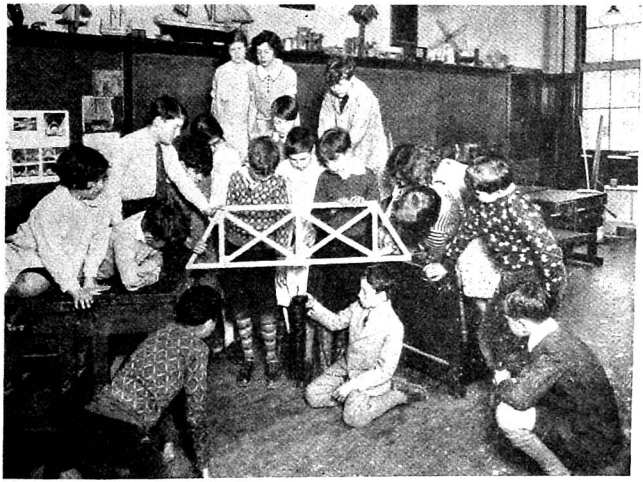
A square or a four-sided figure, if pressed will lose its shape because the three top sides press towards each other and the bottom side stays still. If a piece of timber is put diagonally from one side to the other it will make it strong.

A pentagon or a five-sided figure is not so strong, because the two top sides press toward each other and the two sides press toward each other. To make this figure strong one should put a piece of timber across the top and a piece of

timber diagonally on the other two sides. This will make three triangles and the figure will then be strong and solid.

With these three figures we can prove to you that the triangle is the strongest of all geometric forms.

The teacher felt confident that the content of the unit of work would stimulate much individual thinking about the structural problems involved in architectural plan-

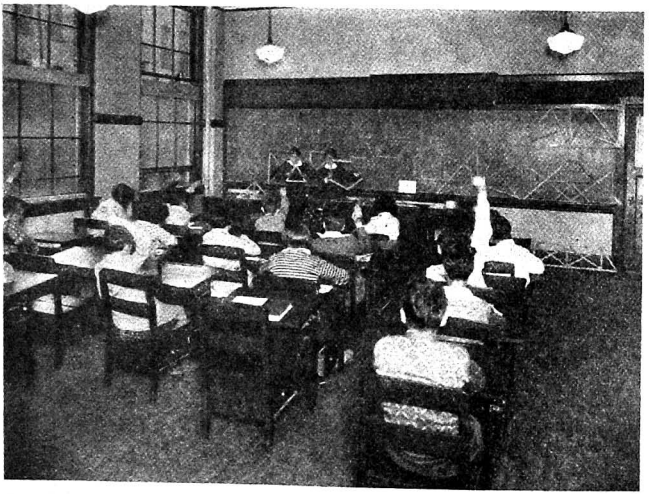


THE CLASS WATCHES A TEST OF THE STRENGTH OF A TRUSS MADE BY MEMBERS OF THE GROUP.

ning. In this she was not disappointed. The following incidents are typical of the intensive study carried on by individual children.

One of the class problems dealt with the importance of the span and the truss in helping to support and distribute

the weight in buildings or other structural forms. The group became intensely interested in this problem and built trusses to illustrate the points made in discussion. This was an activity undertaken by a group of children

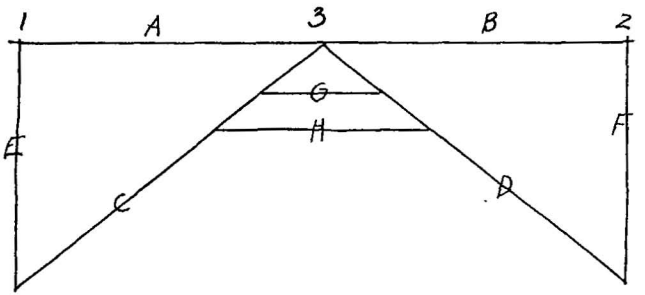


DEMONSTRATING GEOMETRIC FIGURES FOUND IN ARCHITECTURAL DESIGN. THESE FIGURES WERE CONSTRUCTED IN THE INDUSTRIAL ARTS SHOP BUT THE MATHEMATICAL APPLICATION OF THEM WAS DEVELOPED THROUGH CLASSROOM DISCUSSION DURING THE ARITHMETIC PERIOD. A KNOWLEDGE OF GEOMETRIC DESIGNS WAS ESSENTIAL TO AN UNDERSTANDING OF THE FUNCTION OF ARCHITECTURAL STRUCTURE.

at the suggestion of the Industrial Arts teacher. The Science teacher had previously contributed information about the mathematical principles involved in such construction, thus providing the intellectual background for the structural problem. The children built the trusses

and showed the class miniature forms of these structures, explaining by means of them the principles involved.

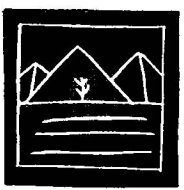
One of the boys prepared, without either assignment or suggestion, the following diagram and explanation of a part of this activity.

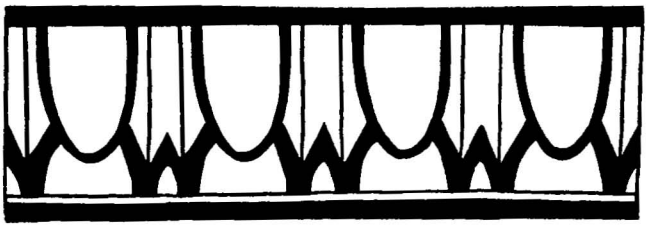


One rule that influenced the making of these trusses was that no one piece of wood could stretch the whole length of the span—four feet. Our truss was planned according to gravitational pull so that when we divided the strip 1 to 2 in two parts (A and B) we had to distribute the strain from 3 with two diagonal strips (C and D) and two other strips. To keep E and F from spreading apart we put a horizontal piece (G) in place. This did not relieve the strain entirely so another board (H) found its place parallel to G. Six other members found their corresponding places and thus finished the truss.

The evidences of interests revealed by the foregoing instances are but a few of those expressed by individual children, but they are indicative of the general attitudes and tendencies of the group. That their interests in buildings aroused through this unit of work will be keen throughout the next few years is not to be doubted; that this influence will continue throughout their lives is to be hoped. For a few children it may be the means of helping them to select their life professions; for others it

may be the interest that will direct some of their avocational pursuits. The training given during the study was not devised for the purpose of making architects of the children, but rather to help develop a consciousness of beauty, its significance, and its influence in our everyday life.





Chapter IX

HOW STUDY HABITS WERE CARED FOR

While these varied and far-reaching activities were in progress, the teacher was equally concerned about the study habits that were being formed. The fiber of this study was necessarily very loosely woven for some time after the unit was initiated. Under these rather disorganizing influences the children might easily have formed some very slovenly methods of work. Such a result could easily follow when each child was interested primarily in a different period of the history of architecture. As there was no effort made in these first days of the study to present this story in a chronological pattern, many of the children were "at sea" for several days. They sought blindly for some detail or bit of information that might please the teacher or that might make a fine showing.

One of the first manifestations of this superficiality came about through the announcement that notebooks

should be handed in for examination within a specified time. These notebooks were not to be completed, but they were expected to be in some logical form indicative of the general plan being followed by each child. The announcement was like a spark to gunpowder. Immediately those children who heretofore had slid along with the least possible application began to work. They read diligently and copied intensively from materials found in their reference books. The teacher was aware of this practice, but she refrained from commenting upon it until the material was submitted. By this time she was conscious of the ability of each member of the group. Children whose oral reports were incoherent and lacking in content showed these tendencies in their written work. They tried to slur over or to "talk big" on topics about which they knew very little, or nothing at all. Children whose ordinary expression was very childlike presented material worthy of the efforts of a high school student. Individual cases showed evidences of help from parents or other adults. In these instances the teacher, through tactful questioning, was able to verify her own suspicions. No child was made to suffer for this misguided endeavor. It was pointed out to him, in a pleasant yet firm way, that this notebook was to represent his own ideas about architecture and not the ideas of any members of his family or of any one reference book. If the child persisted in the denial of adult help, he was given the opportunity to translate orally his "bookish" report into natural childlike language. This second attempt was accepted in place of the original stilted copy.

A few children were making glaring errors in trans-

lating the material acquired from many reading sources. Upon being questioned they frankly admitted that they could not understand what they were reading. These children were given opportunities to talk over with the teacher the information acquired or to seek help in mastering the printed page.

From these conferences, the teacher more readily understood the handicaps under which the children were working. Native limitations were taken into account. A simplified reading list was presented to them and specific help was given in extracting and compiling pertinent details when a number of books were used as references. Generally speaking, however, most of the reading errors were brought about through hurried, thoughtless scanning.

Two types of exercise were given in order that the teacher might analyze individual erratic reading habits. In the first type of exercise the pupils answered specific questions. An article dealing with ancient Egypt was read to the children. Questions which were answered by this article were written on the board and were kept in front of the class all during the reading. There were no restrictions regarding notetaking or jotting down memoranda.

The article read is submitted here. The questions asked are reproduced following the quotation.

THE STORY BOOK OF THE MONUMENTS OF EGYPT [1]

Trade with the Egyptians was encouraged by all of the nations of ancient Europe. These peoples felt that Egypt had

[1] Adapted from Wells, Margaret. *How the Present Came from the Past.* Book II, Chapter I., New York, The Macmillan Company. 1917.

developed a progressive civilization from which the Europeans could derive much help and many suggestive ideas for the building of the newer nations. Therefore they were anxious for trade relations with the countries beyond the Mediterranean.

From these relationships the Europeans came to know much of the history of Egypt and the conditions under which the Egyptians lived and worked. Their tombs and monuments, which might be termed the first pages of the Egyptian story book, reveal the thrilling story of this great civilization.

The greatest influence in the lives of these people was the River Nile which flowed through the rainless country. It alone was responsible for the richness of the soil which supplied valuable crops for the Egyptians. Bordering it on either side were thousands of acres of fertile farms. Every year the Nile overflowed its banks and spread a deposit of rich earth over these lowlands. When the floods had receded, the land was tilled and sowed and rich crops were later harvested. If it had not been for this great river, the land of Egypt would have remained a barren waste. It is no wonder, then, that we speak of Egypt as the country of the Nile.

Students of history believe that Egypt began to develop about 8000 years ago. Its early history reveals the same kinds of beginnings as those of later European nations. The ancient graves are the monuments of the Egyptian Stone Age. These graves were low mounds sometimes covered with stones. Inside these graves were found numerous stone tools and implements used by the people. At that time the Egyptians had not learned about the uses of metal, so their crude implements were patterned from the materials found around them.

Remains of their villages were found later in the ruins of mud huts in the Nile valley.

In the graves great quantities of linen thread and linen cloth were found also. This indicated that flax grew plentifully in the fertile Nile valley. These people must have known how to spin the flaxen thread and how to weave it into cloth.

At first, trade was evidently carried on chiefly within native

tribes. As trade thrived and villages increased in number and size, this trade expanded to other tribes. This increased trade necessitated the invention of new devices to record their business transactions. Men had to keep an account of their indebtedness and their profit. Through this necessity they learned to write and to keep accounts. True, this writing was of a different form and nature than that in use today, but nevertheless it reveals the Egyptians' earliest efforts to express themselves through written characters. These records were of a private nature, however, so they have not been preserved. Among the earliest writings to survive through the ages are the lists of kings' names found on some of the ancient tombs and monuments.

On what material do you think this first writing was inscribed? At first, the Egyptians carved their written characters on stone; later they used clay slabs or tablets. The characters were pressed into the wet mud with blunt instruments. These tablets were then put aside to harden or to be baked in the hot sun. These two kinds of "books" were impracticable, however, for they were bulky and required much room to store. In addition they could not be moved about easily. The Egyptians continued to experiment with many different materials on which they might write. These experiments led eventually to the discovery of papyrus reeds as writing material. It is from the name of this reed that we get our word *paper*.

Papyrus reeds also furnished pens for the Egyptians. They were cut to the desired length, then one end of the reed was frayed out to make a brush. Their ink was made from plants or minerals which were ground to a powder and mixed with gum and water. This ink could be colored to suit the needs of the writer.

At first their writing was merely a series of straight line pictures. Each picture represented a word, thus their alphabet was made up of great numbers of pictures. A little later this was simplified, for each picture was given a definite meaning associated with it but not necessarily described by the action

of the picture. Soon after perfecting this written language they introduced a number of sound-signs which stood for syllables. Later their written language underwent a final change when the Egyptians began to use signs for single letters rather than for syllables. By 3000 B.C. they had developed an alphabet of twenty-four letters.

Historians disagree when they try to decide whether this ancient Egyptian alphabet was the earliest ancestor of our own alphabet. Some claim that the Babylonian alphabet was in use before the Egyptians perfected their writing system. However, students all agree that both alphabets were changed and modified repeatedly before they came to resemble those in use today.

The early Egyptians also invented the calendar. They judged the time of day by the position and direction of the sun. But this was not sufficient information for their use. They needed to know the number of days passing between religious festivals. Likewise they needed to know the dates on which their taxes and trading debts fell due. In 4241 B.C. they devised a plan for dividing the year into twelve parts or months. Thirty days were allotted to each month. The five additional days in the year were set aside for a festival time.

These two improvements were not the only contribution to civilization devised by the early Egyptians. They tried to introduce new skills into their everyday activities, they changed the old order of things and improved their methods of work. The rulers of this ancient nation through their efforts to express the ideals of their time built one of the most impressively progressive civilizations of ancient times. Their discoveries, inventions, and industries all point to the superb achievement of their enterprises. Take, for example, their giant tombs and pyramids which have survived even to our generation. Recall the low, roughly built mounds erected over the graves of the earliest Egyptians. Contrast with these the massive and impressive pyramids built by the later Pharaohs. Some great factor was responsible for effecting this great change in their building activities. How were the huge stones of the pyramids

cut? how were they transported from such distances? how were they raised and secured in place?

The discovery of the use of metals is the answer to these questions. Before the pyramid period, the Egyptians had used stone implements and tools. These crude tools were hardly strong enough to do the work of these later times. Man needed a stronger, a more lasting material for his tools. Through the discovery and the manufacture of metal the Egyptians were able to carry on these great activities and to build monuments which have withstood the ages.

Copper, which was discovered about 4000 B.C., was the first metal used by the Egyptians. Most of this material was brought to Egypt from the island of Cyprus. However, the workers soon found that it was too soft to cut or carve most kinds of rock. After many years man learned to mix tin with copper and to make it harder. This mixture made an alloy known as bronze, a strong and useful metal to aid man in his work.

Questions

1. Why is Egypt the gift of the Nile?
2. What would you call the first page of an Egyptian story book?
3. What is linen made from?
4. What is the earliest type of record written?
5. From what word do we get the word "paper"?
6. About what time did the alphabet come into being?
7. Is it true that the Egyptian alphabet was the first?
8. When, how, and by whom was a year divided into twelve parts?
9. What had to be discovered before the pyramids could be built?
10. What is bronze?

The class period following the reading was given over to writing the answers to the questions. Fourteen of the twenty-two children answered all the questions satisfac-

torily; six showed evidence of a lack of understanding of the material and two were unable to follow the directions outlined.

Those children who had not fully understood the story were given the opportunity to ask questions about topics which were vague to them or which they misunderstood, or to explain other difficulties they met in trying to interpret the article. In most cases, the difficulty arose because the questions had not been correctly interpreted. For instance, two children interpreted the second question literally. One of the girls, apparently not having caught the reference in the text, thought that the "first page of an Egyptian book" referred to the format of any book in use to-day. In order to substantiate her reasoning she asserted that the first page of an Egyptian story book should be an illustration, and to prove her point she showed a reference book which she had taken from the desk drawer. One of the boys answering the same question said that the first page should be a title page. He also proved his point by producing a textbook from his desk. When shown that the question referred only to the text read they then understood and were able to give the correct answer.

The two children who failed to qualify in this activity said that they had never before had any experience in this type of exercise. The oral reading confused them. While they were concentrating upon forming answers to the questions, the teacher had read beyond that question and they lost the thread of the narrative. This so distracted them that they were unable to follow the reading.

Ordinarily, sixth grade children should be able to carry on such an activity, and this failure on the part of two children actuated the teacher to investigate the history of their cases to find the reasons for their failure. She found that one of them, new to the school and therefore unaccustomed to such methods of instruction, had achieved an unusually high rating in all the tool subjects and his intelligence rating indicated superior mentality. After securing this information, the teacher questioned the child. He said that he knew he could have answered all the questions if he had read the material for himself. Questioned further, he admitted that he had often taken "reading tests" in which he had to answer questions about a paragraph or topic which were similar to those asked in the exercise. In this case, however, the novelty of the activity had completely nonplused him. He talked very freely to the teacher and during the course of the conversation he gave evidence of his understanding of the reading. The mechanics of the test puzzled him and therefore diverted his attention from the development of the theme. He asked that he be given the printed material to read alone and an additional period in which to write the answers to the questions. This request was granted and he gave satisfactory evidence of understanding and interpreting the article. Under ordinary circumstances this child would have been expected to carry on the activity as the class had done; but in this case an exception was made because of the superior attainment of the individual. After he had finished the exercise the teacher found many opportunities for him to take part in similar activities until his stereotyped reactions had

been broken down. The child himself was not responsible for his inability to measure up to an expected requirement; his training had all been in line with a certain routine or technique required for taking tests.

The second child traced her difficulties in this reading activity to a mechanical handicap. She had recently been promoted from the fourth to the sixth grade and therefore was not so proficient in expressing her reactions in writing as the children who had made the regular promotions. She understood the article and, in answer to the teacher's questions, could translate its meanings. The medium of writing so hampered her thinking that she had failed in completing the activity satisfactorily. Her ability was unquestioned, for records proved that her mental ability was comparable to that of any child in the class. Practice alone was lacking. This was provided through extra tutorial help until she had acquired some of the skill needed to express herself in written form. This skill was not wholly acquired in one year, but foundations were laid and inspiration was supplied to stimulate her to greater accomplishments in succeeding years.

The content of the reading was further discussed by the remainder of the class. The children were given individual opportunity to extract the "meatiest" parts of the material and to apply these as answers to the questions. When there was further difficulty the teacher and the children sat down together for a period of intensified study. The teacher read each section slowly and carefully, asking when she had finished, "Does this section answer any of the questions?" Each child was required

to prove the application of the content to the question before his answer was accepted. In those paragraphs wherein there was no direct answer, a discussion brought out the implications of the hidden content. Then each child was encouraged to adapt these implications and express in his own words the real meaning of these sentences.

The first question, for example, was a very difficult one to answer. No particular part of the quotation answered it directly, yet each part contributed to a general concept of why Egypt is the gift of the Nile.

Within a short time after this, an exercise of the second type was given to the children. In one of the preferred reference books a whole page was devoted to brief quotations about architecture. The children were directed to read these until they came to one that was particularly pointed in meaning and was easily understood. Some of the quotations [1] from this page are:

> Architecture can want no commendation where there are noble men, or noble minds.
>
> SIR HENRY WOTTEN.

> Architecture is a species of language. It tells us as much of Greece as Homer did, and more of the middle ages than has been expressed in literature.
>
> EIDLITZ.

> Architecture is a printing press of all ages, and gives a history of the state of society in which it was erected.
>
> MORGAN.

[1] From Barstow, Charles L.: *Famous Buildings*, New York, The Centuty Company. 1915.

The more you spend on architects, the less you will have to spend on prisons.

JOHN BURNS.

Every genuine work of art has as much reason for being as the earth and the sun. . . . We cannot look at works of art but they teach us how near man is to creating. Michelangelo is largely filled with the Creator that made and makes man. . . . Meantime be it remembered, we are artists ourselves, each one, competing with Phidias and Raphael in the production of what is graceful and grand.

EMERSON.

The majority of the class decided that the quotation by Morgan was the most meaningful to them. This was a logical conclusion for it is undoubtedly the simplest and most graphic of all those quoted. Two children selected the quotation by Eidlitz and readily reproduced its meaning in very child-like language. One boy selected the last quotation as his choice. Upon being questioned, he was unable to give the meaning of the quotation in any sort of coherent form. He was then asked to read the selection aloud. This oral rendition was requested so that it would enable the class to judge whether or not the reader was capable of understanding the author's words. He read about half the quotation in a hesitating, stumbling, non-intelligent manner. He was given ample time to read as slowly as he wished or to study over phrases or sentences before he voiced them. The class grew impatient with his faltering hesitancy and they soon registered attitudes of dissatisfaction. Finally, after several attempts, he had to acknowledge that he did not understand what the reading was about, nor could he

read the quotation with any semblance of intelligence. He tried to justify his selection of quotation, but finally he had to admit that he chose this particular selection because he thought that it meant more to the adult mind. In other words, he was "playing up" to the teacher whom he wished to impress with his maturity of thinking, and was trapped by his own handicaps.

This was a particularly significant occasion for this individual child. He was accustomed to creating *impressions* of thinking and of study; but his real depth of application was obviously very shallow. Evidently he had been able at other times to "get away" with such practices; but in this case he had to learn that superficiality is not a mark of superiority. The boy suffered embarrassment and chagrin at the time of this check-up. For the timid, reticent, or unprotected child such measures would have been detrimental to further progress or individual effort. The teacher in this case was reasonably assured about the temperament and emotional make-up of the child before such treatment was meted out. Since her object is the whole and full development of the individual she could not permit such artless bluffing as this to go unchallenged. The suffering and anxiety of the child were only momentary, but the impression gained was permanent.

Another specific instance of training in desirable study habits was based on a related reading exercise. The children in one class had acquired a slovenly, casual method of using reference reading. Their eyes would alight on some of the most unessential ideas and these,

through a personal childish appeal, would be rated as governing thoughts or controlling ideas. On one occasion, the children were to read an assigned chapter from an architectural textbook. The object was to read the assignment thoroughly and then to interpret the outstanding ideas in a written summary of three or four sentences. The summary could be either in original language or could be copied in the words of the book. However, the children were encouraged to express their ideas in their own words. The gist of the chapter was that domestic architecture is an expression of an advancing civilization and has always been influenced by environment, use, and available material. In the chapter, reference was made to the log cabin home of Lincoln, to the temporary tent villages of nomadic tribes, and to the ruins of the caves and huts of the earliest Lake Dwellers and Cave Dwellers. These were merely illustrative points which elaborated the discussion of the chapter. Naturally these topics were more easily read and mastered. They required much less study effort than the essential subject matter. It was no wonder, then, that some of the children of this class with their haphazard reading habits should pounce upon these irrelevant references as most important. A few of the summaries are given to show the study limitations of this particular group:

The log cabin in which Lincoln was born had many of the elements of good architecture.

Cave Dwellers, Lake Dwellers, and nomads had their own kinds of architecture.

Every one becomes interested in architecture at some time in his life. This usually happens when he builds or repairs

his own home. Then he tries to plan his house so that it represents him.

We do not become architects by building houses or reading books about architecture. These only help us to appreciate what we see.

Domestic architecture began when people needed homes. Many homes made a village. The village may grow into a town, and later a city.

The log cabin was convenient. It was well lighted and ventilated. It expressed itself and its owner.

Every home should be suited to its surroundings.

At a subsequent discussion period a few of these summaries were read to the class. Their reactions to these interpretations helped to clarify the somewhat vague impressions obtained from the reading. The children were led to see that each thought in the chapter contributed a small part to the general theme. No one sentence or paragraph expressed in words the dominating idea, though each contributed a vital part to the general theme. The chapter topic could not have been chosen until the entire chapter had been read and thought about. It was pointed out that after due reflection the general impression obtained from the reading would be the main idea or topic of the chapter.

A few children were baffled and nonplused at this assignment; two or three seemed almost unable to complete it. Their reports showed very little understanding of the subject matter. Instead of giving too much help, the teacher asked them if they would not rather have an opportunity to read this material again and write a second report. Some interesting comparisons between the first and second reports from the same pupils follow:

A's First Report

People live in different kinds of homes according to the surroundings. You learn to be an architect and like architecture by seeing beautiful buildings.

A's Second Report

A long time ago people lived in caves. Some people's huts were supported by poles in a lake. These people were called lake-dwellers. People who had pastures built a tent so they could move from one place to the other. Later man built better, warmer, stronger, and more comfortable log-cabins.

People live in different kinds of homes according to their surroundings. You learn to be an architect and like architecture by seeing beautiful buildings.

B's First Report

Homes should fit in with their surroundings. They also should be convenient to their owners.

B's Second Report

Everybody needs some form of shelter to protect himself against cold, rain, and wind. Primitive man used caves, holes in the ground, and poles over the water. Later on, men built log huts.

Every home should fit in with its surroundings and meet the needs of the owner. Homes also should be convenient for their owners.

Conclusions about the value of this type of exercise are obvious and need no further elaboration.

Several children voluntarily analyzed their own approach to this assignment. One boy said he read the whole chapter through and then went back to the paragraph he thought most pertinent. From this he selected the idea or the sentence which, to his mind, best expressed

the general idea of the chapter. A girl admitted that she "just read" until she came to a sentence that sounded like a summary. Then she copied this from the text. Another child said that he read through the entire chapter; then he wrote down in his own words what he thought it was all about.

These three study approaches are typical of many children; they represent the significant degrees of mastery among individuals. The one child is concerned with creating impressions, the other with jumping at conclusions, and the third with weighing and evaluating before offering an opinion or conclusion. All three types seem to be a part of our educational system at the present time, but each child should learn that such "rule of thumb" methods are not always applicable. These methods must be interactive and selective, depending upon the occasion for their use.

Individual weaknesses very frequently have a great influence upon class endeavor. If thoughtless, sloppy work is accepted from one child, then the same privilege must be extended to all. Individual differences and limitations guide the teacher in setting up standards for class attainment; but except in special cases, nothing but the best efforts of individual children should be accepted.

Such instances as the following provide valuable opportunities for the much needed drill in written expression. One of the boys went off by himself to review a book which had been sent to the classroom reference shelf by the school Librarian. He brought back a fragment of torn gray paper on which he had scribbled his report. It

was inexcusably unsatisfactory. Many words were misspelled and, in general, the composition was certainly below the sixth grade standard. The boy who wrote this review has an exceptional mental ability and was rated as one of the most capable children in the class. His report, therefore, should have been of unusual value. It is reproduced here exactly as it was written originally.

This book is mostly all pictures but beside each picture there is a description which is very complete and tells about everything to do with the stutue panel or what eve the thing may be they are describbing I think this book is very godd and you can get a lot of inrormation from it.

This type of work should not be accepted by a classroom teacher. If the children maintain high standards they will endeavor to prepare their work to meet their requirements. It is no wonder, therefore, that in this instance the proffered book review was rejected. The teacher called the boy for a private talk and confronted him with his written report. He realized that he was at fault but offered as his excuse that he had no other paper with him at that time and he felt somewhat hurried in writing his reactions to the book. Upon further questioning the child admitted that he was frequently puzzled when writing similar reports. His sentence sense was limited to some degree for he had difficulty in telling where sentences should end. He expressed himself remarkably well when making an oral report; but he failed hopelessly when preparing any written composition. In addition to his indefinite ideas about sentence structure, he was handicapped by the lack of facility in handling the tool subjects. His penmanship was poor and his

spelling was none too certain. He had already formed the habit of discarding his written efforts because they were not so clear as his oral work. He thought faster than he wrote; therefore, his writing was a hodge-podge of unfinished ideas and vague reproductions of his actual thinking processes.

Several other children in the class were in a similar predicament. There was nothing to be done but to give them individual help until their difficulties were somewhat overcome. It so happened that several members of this group had an unassigned period during the day which they used for study or for individual work. The teacher utilized this extra time for special instruction in written English. She talked with each child individually about his ideas of sentence structure, paragraphing, and other structural details. Some of the children acknowledged that their inability to express themselves in writing arose from their antipathy to perform the mechanical details of putting down each word. In short, laziness was their sole excuse. Other children with limited experiences in written composition found great difficulty in expressing themselves naturally and in a straightforward, simple way. They were evidently accustomed to measure their work by adult standards; consequently, their written efforts usually prepared under supervision were stilted, artificial, and dull. Others of the group were merely suffering from limited experience in actual writing. Ordinarily glib and sometimes verbose, they seemed unable to function when asked to write their ideas rather than to talk them. What most of them needed was *practice* in writing simple compositions or original stories.

Frequent use of these unassigned periods eventually wore down class resistance to writing reports, reviews, and original compositions. Perfection was not the goal but rather an ease of writing which would produce fluent, coherent, and legible results.

Naturally the children raised many pertinent and leading questions during the course of the unit of work which helped to direct their study. Some of these arose from discussions; others grew naturally from their reading activities and excursions. Some of the questions asked earlier in the study were used as a tentative initial outline or introduction to the possibilities of this study of architecture. These have already been noted earlier in the book (page 10).

Questions based on reading materials were probably most helpful in directing their study habits. Some of these questions were answered satisfactorily and completely by the text; others were merely suggested by the content and stimulated the children to look for further information in other source references, which would supply accurate and fuller answers. They read the references for this information and quoted only those statements which directly answered the questions. All irrelevant material was omitted in reporting upon these findings. The children decided that, before they were accepted, all answers to questions should be verified from quotations from the source. This exercise provided excellent practice in thorough acquisition of the materials and in their evaluation. It may have been largely responsible also for the great growth in reading power manifested by the

class and in the improved study habits noted during the year.

The children themselves recognized the values of raising questions and of expressing their questions in intelligible form. Previous to this activity the pupils had discussed the matter of concise expression and how they might acquire it. They were prepared, therefore, when raising questions to adhere to certain standards. They cited the following values which they expected to derive from such an activity.

1. To find out more exact material for notebooks.
2. To outline problems for deeper study.
3. To learn better how to use textbooks.
4. To stimulate better thinking.
5. To develop habits of accuracy in reading.
6. To give practice in selecting worthwhile details.
7. To give practice in picking out essential ideas.
8. To reduce many ideas into a short report.
9. To use "short cuts" in reading.
10. To help our English by putting ideas into question form.

At first the questions had neither form nor organization. As a child asked a question, it was written on a card and placed in an index file for future reference. At a later time, one of the children suggested that the questions should be catalogued in order of sequence and historical periods. He assumed as his individual responsibility the task of reorganizing these materials, classifying them under the different periods of architecture in which the class was interested. Towards the end of the year, several of the class periods were devoted to the consideration of these questions. Each was read

and discussed. If it had been answered through class discussion and to the satisfaction of the majority of the class, it was set aside as work already completed. Any question about which there was dissension or lack of unanimity of opinion was filed for further study. As materials were found which answered the debatable questions, they were introduced to the class which passed upon their value and authenticity. As a question was answered it also was added to the materials completed. Before the close of the school year all the questions asked had been answered satisfactorily and the answers had been checked by quotations from authoritative sources.

The following are types of questions which were raised by the children during the study and later arranged under the classifications designated by the child who organized the material. In a way the questions formed a brief summary of the mass of material to which the children had been exposed during the year. The questions included here are merely suggestive of the valuable inquiries raised during this unit of work. They represent more than mere curiosity and a passing interest, for such questions were stimulated by a background of information and interpretation and not by an over-stimulated or momentary enthusiasm.

EGYPTIAN

1. What is the greatest influence in the environment of the Egyptians toward their architecture?
2. What are the outstanding characteristics of the monuments of Egypt?
3. In what ways did Egyptian architecture reflect the ideals of the people?

4. Why can we use the monuments, tombs, and temples of ancient Egypt as the history books of that civilization?
5. What agencies were responsible for the splendor and the magnificence of Egyptian architecture?
6. What is the proverb that describes the outstanding characteristic of the pyramid of Cheops?
7. What are the characteristics of the pyramid of Cheops?
8. How many people and how many years did it take to build the pyramid of Cheops?
9. Under what conditions did the Egyptian builders work?

GREEK

1. Why did the Greeks excel in sculpture?
2. What is the Greek style noted for?
3. What is the purpose of Greek temples?
4. What was the crowning ornament of Greek buildings?
5. Which was the earliest Greek order?
6. What are the different temples on the Acropolis?
7. What does *Parthenos* mean?
8. What happened to the sculptures of the Parthenon after the Turks had acquired them?
9. Why were the steps leading to the entrance of the Parthenon uneven in number?
10. Why did the Erechtheum have an irregular shape?
11. What different stages did the Erechtheum go through?
12. How did we get the name *column?*
13. What is the difference between the Greek and Roman dentils?
14. How did the Doric order come about?
15. What is the best example of the Corinthian order?
16. What is the best example of the Ionic column?
17. What famous Greek building used the caryatid?
18. Why were the different Greek temples built according to special orders?
19. What was a Greek theatre composed of?
20. Which used more ornaments—the Egyptians or the Greeks?

21. How long did it take the Greeks to build some of their buildings?
22. What would you see if you walked about the streets of Athens in the Golden Age of Greek art?

Roman

1. Why could Roman architecture be called Greek architecture?
2. Was Roman architecture only used in Italy?
3. What is an amphitheatre?
4. What great building material did the Romans discover?
5. How did the arch develop?
6. How did the triumphal arch come to be?
7. What does the word *Pantheon* mean?
8. How was the building of the dome of the Pantheon solved?
9. What does the Pantheon contain?
10. What are the two parts of the Pantheon?
11. What is a forum?
12. Why did the Romans use engaged columns?
13. What was the Roman composite order composed of?
14. What is the most perfect example of Roman architecture that has been preserved?

Romanesque

1. What does Romanesque architecture indicate?
2. What is the most outstanding example of Romanesque architecture?
3. Did the Romanesque architecture use the rose window or the wheel window?
4. What is the difference between the Norman cathedrals and the Romanesque cathedrals?

Byzantine

1. What is the outstanding feature of Byzantine architecture?
2. What period did Byzantine architecture follow?
3. How many parts did the Byzantine dome have?

4. What is the difference between the dome of St. Sophia and the dome of the Roman Pantheon?
5. Why did the Byzantine style not use many moldings?
6. Who erected the present St. Sophia?

Renaissance

1. What does *Renaissance* mean?
2. What are the different Renaissance periods?
3. What one architectural defect was found in St. Peter's at Rome?
4. Who was Raphael Sanzio?
5. What are the characteristics of Renaissance architecture?

Gothic

1. How would you know a Gothic building?
2. How did the Gothic architecture grow out of Romanesque?
3. How did Gothic get its name?
4. What are the differences between French and English Gothic?
5. What are the characteristics of Norman architecture?
6. What is the meaning of having thirteen steps as the approach to a cathedral?
7. Why was it necessary for the Gothic architecture to have ribbed vaulting in its roofs?
8. How many styles are there of pointed arches?
9. What is the history of the pointed arch?
10. How did the flying buttress get its name?
11. Why doesn't the flying buttress reach all the way to the ground?
12. How did the flowing tracery come to be?
13. What was the gargoyle used for?
14. Why are the rose windows placed high up and in the west front?
15. Why is a trefoil window so called?
16. What would be a more meaningful name for the Pointed Arch Style?
17. What is a clustered column?

18. Why was great attention given to the front doorway on a Gothic building?
19. What is the largest of the English cathedrals?
20. What style displaced Gothic architecture?

Modern

1. What are the architects of today trying to create?
2. How did the skyscraper come to be?
3. What is modernistic architecture?
4. What is the use of a setback?

Futuristic Architecture

1. What will Futuristic buildings represent?
2. What new mechanical apparatus will we probably use in the interior of future buildings?
3. What will be the economic effect in the future when we use so many machines?
4. What changes might be made in our daily lives in the future?
5. What new features might be used in the schools of the future?
6. How will the ventilation probably be perfected?
7. What probable shape will the future buildings be?
8. Of what materials will the future buildings probably be made?
9. What do some architects think the height of future buildings will be?
10. In what kind of homes will we probably live in the future?
11. What might we expect our future cities to be like?
12. Who are some of the outstanding men who are influencing futuristic architecture?

Miscellaneous

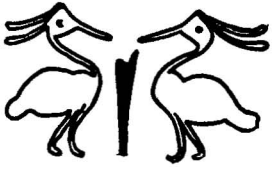
(Difficult to classify)

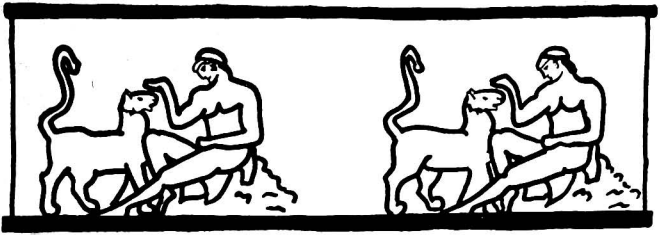
1. What is a colonnade?
2. What is another name for Saracenic architecture?

3. What are the characteristics of a castle?
4. What inspired Galileo to discover the idea of the pendulum?
5. Name an outstanding architect or personality who affected each style of architecture?
6. What is domestic architecture?
7. If a column does not support something, what is it?
8. Why are there flutes in some orders and not in others?
9. What does Ruskin mean by "eye and lips of a building?"
10. In what period did the wheel window begin?
11. In what style of architecture did the vaulting of the roof start?

After the unit of work was firmly launched each child found his own method of study. This met with his own needs and filled satisfactorily his own requirements. Sometimes the teacher talked with individual children about their methods of getting information but, generally speaking, she did not interfere with their plan for carrying on their work. At irregular times she would present some current printed material and discuss the content with the class thereby setting a standard by which the pupils might improve upon their study methods. She would ask frequently, "What is this author trying to express?" "How has he conveyed his ideal?" Or, again, she might say, "What is the 'meatiest' idea that you get from this discussion?" She tried in many ways to have the children extract concepts or generalizations from their readings and discussions. They frequently contradicted each other, but no argument was considered final until proof of the statement or the controversy was found in an authoritative source. Hearsay or conjecture was not accepted unless it could be upheld by proof. Thus through questioning, investigating, evaluating, and verifying, a

helpful general plan of study was evolved by the children for their own use. This plan was adopted by individuals and modified to suit their needs as they found more efficient and less involved methods of work.





Chapter X

TESTS GIVEN DURING THIS UNIT OF WORK

TEACHERS initiating units of work in their curricula will find that few specific tests dealing with their particular topic are available. They will have to depend more or less upon types of tests similar to those described in this chapter.[1] These particular studies are merely suggestive of the possibility of teacher-made tests, which must be substituted for standardized measurement until more adequate subject-matter tests can be devised. The examples of these informal studies are imperfect and would, no doubt, be rejected by those interested in standardized test-making. However, the purpose of presenting them is not to give flawless models of studies, but rather to show how one teacher devised tests based on the particular work of her classroom. The tests described in this chapter can be improved upon by other teachers who

[1] A more detailed account of the use of informal tests in connection with a unit of work may be found in *Indian Life and the Dutch Colonial Settlement* by Keeler and Sweet. Bureau of Publications, Teachers College, Columbia University, 1931. p. 289.

wish to carry out similar analyses of the results of their teaching or who feel a need for diagnostic tests. Very few tests are available for use in connection with the study of the history of art or of architecture. Therefore, in this instance the classroom teacher had to depend, more or less, upon the "home-made" type of test to measure the rate of progress during the study. This type of test was used two or three times in the class during the time that the children were centering their interest on the story of architecture.

The purposes for giving these tests were similar to those for which standardized tests are given. At one time they were given for diagnostic purposes; at other times they were used merely for testing the facts and generalizations learned through study. One form of test might be used for summarizing purposes, another for organization of materials. Some tests are used occasionally as teaching devices or to stimulate broader interests and effort. Frequently pre-tests are given before a unit of work is initiated. The purpose of such a test is to determine beforehand the amount of information known about the subject. These tests are general in nature and are not confined to one phase or topic of the study. Usually specific terms and a particular vocabulary are used. These terms are identified particularly with the more technical phases of the study and are meaningful only to those children who are rather well-informed on the subject. For instance, no child unless specifically informed about *volutes* would be able to interpret a question based on the use and definition of this word. If, in a test, a child makes intelligent use or interpretation of the term,

the teacher may assume that the child has had some previous experience with the word. The more technical the term the more fully may the teacher be assured that its meaning has been gained only through context and intelligent use.

At the beginning of the school year these sixth grade children found that library references must be used frequently during this study of architecture. However, wrong use of the library or of reference books, inefficient means of finding references, and lack of information about using a variety of sources proved great handicaps to accomplishment. Several of the children were new to the school and were uninformed about the use of a library. Many in the class were not accustomed to using more than one or two references, so they needed help in the use of the library files. In general, there was an indefiniteness of approach when the class went to the library to seek definite information. Here was a most auspicious opportunity for a diagnostic test. With the help of the Librarian, the classroom teacher made the following general test on the techniques for using the reference library. While this test was not specifically a subject-matter test nor related directly to the study of architecture, it was of great importance in helping the children to acquire an automatic skill in facilitating methods of study. The test aimed at a maximum use of the library and included most of the skills needed for intelligent use of references.

CAN YOU USE THE CARD CATALOGUE?

If you can, answer these questions. It will show that you can use the card catalogue. Write answers below each question. Consult the suggested references whenever necessary.

1. Find out by using the card catalogue if we have a book called *Ernest, the Policeman* in this library. If you find it listed in the catalogue write down the author's name and the call number.
2. How many books by Charles Boardman Hawes has the library? Write down the title and the call number of one of them.
3. Has the library a book by Ann Sewell called *Black Beauty?* Is this book illustrated? How many pages has it? When was it published?
4. Using the catalogue find two references to information on each one of the following subjects: Radio; Cowboy; Airships. Write down the author, title, and call number of one reference on each subject.
5. How many books by Samuel Langhorne Clemens does this library contain? Write down the title and call number of one of them.
6. Look up *electricity* in the card catalogue. Write down two other headings under which you find information that has to do with the subject of electricity.

Here are some call numbers. Go to the shelves and find the books they represent. Write down the author and title of the book after the call number.[1]

292 B87	353 M34	398 M23	422 B41	551.5 R65	599 D32	620 W67r	973 C86 v.2
973.7 P28	F D55t2	j292 K61	jB B27p	720 W99	780.9 B32	B B64w	942 D55e

ENCYCLOPEDIAS

Find out something about Leonardo da Vinci. (Use the *New International Encyclopedia.*) vol. . . . page . . .

What is wampum? (Use Compton's *Pictured Enyclopedia.*) vol. . . . . page . . .

Look up cyclones. (Use the *World Book.*) Suggest two other places where you will find more information about cyclone disturbances.

[1] Space was provided for writing down names of authors and titles.

STATISTICAL YEAR BOOK

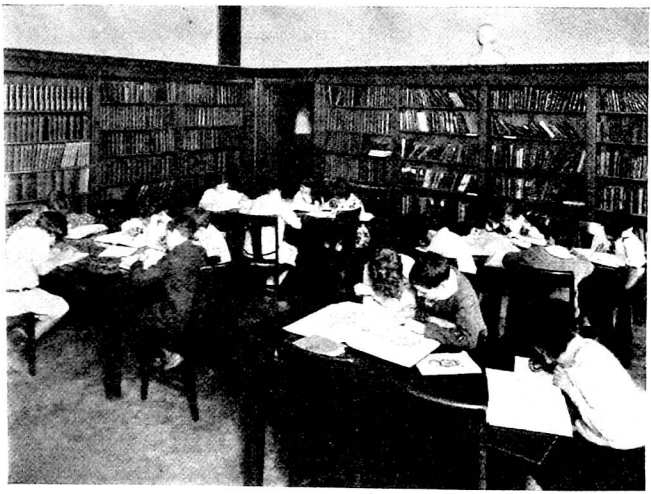
What country in Europe had most miles of railway in 1927?
Reference used: .....
What was the population of the U. S. in 1920? In 1900? In 1800? In 1790?
Reference used: .....
How many immigrants came from Denmark to the U. S. in the years 1831-40?
Reference used: .....

How much coal was produced in the U. S. in 1910? How much in 1925?
Reference used: .....
What is the form of government in Sweden?
Reference used: .....
What is the name of the king of Italy?
Reference used: .....

A few children at a time were sent to the library to work for an assigned period. Because of the limitations of space, all of them could not use the library at one time. This prolonged the time in which the test ordinarily might have been completed. However, since the test was given for the specific purpose of finding out where help was needed, the time limit was not strictly adhered to.

When the test was finally completed each child retained his own paper. The classroom teacher and the Librarian together had already checked the correct answer to each question. The teacher read the correct answers to the class while they checked their own answers. If there was disagreement of opinion or difference in answer the children felt free to advance their own arguments or to ask questions to clarify their own ideas. At this class period, the Librarian was present in the capacity of a specialist

and gave help when it was needed. If any child gave an absolutely erroneous answer, sufficient time was taken to give him the needed help to improve his technique. If, however, the item needed detailed explanation or actual practice in library use, it was noted as was also



THE SCHOOL LIBRARY FUNCTIONED INCREASINGLY THROUGHOUT THE UNIT. THE CHILDREN WENT THERE TO FIND NEW MATERIALS, TO VERIFY THEIR DATA, AND TO FIND DETAILS NEEDED FOR THEIR ACTIVITIES.

the name of the child. At a later period provision was made for the necessary drill to acquire this specific skill. In this way individual needs were provided for and extra study time was made possible.

The checking of test results and providing for additional practice did not end the use of library research

techniques. At frequent times during the year, follow-up activities were used which required the use of these skills. One instance of this follow-up was the compilation of a bibliography of reference books used during the course of the unit of work. In this list of books the children gave specific references by title, author, publisher, date of publication, and page or section-page reference.

Another follow-up activity of similar type was the preparation of a question chart. Certain informational questions asked during the study of this unit were noted on it. As individual children read or studied reference books they kept many of the queries in mind. When they found a reference which satisfactorily answered a question, the title, author, and page was noted on a library card. On the reverse side of the card the question was written. These cards were filed in an index box and placed in a convenient location in the classroom. The class used this file whenever it was needed. This box served three purposes: (1) it filed specific references and helped to compile an extensive reading list, (2) it recorded pertinent questions, and (3) it referred children to a number of sources for information.

After a month's study an informal subject-matter test was prepared. This was really nothing more than an organized written report, the outline for which was prepared in advance by the class.

A number of children had previously given oral reports about the information which they had gleaned from many sources. These reports were very disorganized and showed evidences of a need for greater study. The test which soon followed these reports was prepared for the

purpose of summarizing in a well-organized report all the material found on a given number of topics. To introduce a novel check, the teacher revamped many of the topics and distributed outline maps on which the children were to note locations and boundaries. Each child was given two maps, one of the United States and one either of Europe or of the Eastern Hemisphere. These two maps were given really to challenge accuracy and to stimulate exact thinking. The class needed to make reference to the time chart posted in the front of the room in order to answer one of the questions. This was an application of the new skill which had already been acquired through reading, making, and interpreting a simpler time chart.

This informal written summary, or so-called test, is here given. Each child understood beforehand that he was to interpret the test as referring to the specific period of architecture upon which he was concentrating.

I. The People
   - A. Locate the country on the maps
   - B. Color with crayon the part representing the extent of the country

II. Their Architecture
   - A. Time of periods (refer to time chart)
   - B. Characteristics
   - C. Details and ornaments
   - D. Outstanding building (a short description)

III. Architectural Terms
   - A. Select and tell the meaning of those words (listed below) which are needed to describe the architecture which you are reporting.

Composite	Dome	Capital
Lancet Arch	Entablature	Corinthian
Acropolis	Obelisk	Lotus
Rose or Wheel Window	Fluting	Pharaoh
	Flying Buttress	Naos
Papyrus	Acanthus	Gothic
Ionic	Hieroglyphics	Fret

Shortly after the initiation of this unit of work the school Psychologist was called into the classroom to present a special art test.[1] This test consisted of seventy-two large cards, on each one of which were printed four illustrations rated by 100 competent judges in order of merit. These illustrations showed furniture and utensils, textile patterns and clothing, architecture, and painting and other graphic arts. Each plate dealt with a single subject, but presented it in four different ways emphasizing such art elements as shape and line arrangement; massing of dark and light; and use of color. These four illustrations were marked *A, B, C,* and *D.* The plates were arranged in numerical order and fastened to the walls in the classroom. Each child was supplied with a special record sheet on which he marked the letter of the illustration which, in his judgment, was the most artistic treatment of the subject.

The test in its present form is much too difficult for use by children in the lower elementary school. It is more applicable in the junior and senior high schools. It also serves several purposes for adult testing. For elementary children, however, it has only one use; namely, to measure the ability to distinguish artistic merit. It indicates

[1]McAdory, Margaret. *The McAdory Art Test.* New York, Bureau of Publications, Teachers College, Columbia University, 1927.

chiefly the presence of a power of discrimination between two or more objects of varying artistic merit. It does not predict artistic accomplishment or manipulative perfection.

In reference to the particular use of this test, the results were not of great value in carrying forward the interests in this unit of work. Had the teacher wished primarily to increase power of discrimination, she might have employed the test as teaching material; but her aims in carrying on the unit were broader and more inclusive. These problems in artistic evaluation were but one small part in her program of studies, so she made but little use of the results of this test. She was anxious to have it given to the children primarily to find if, as a test, it had any intrinsic worth in evaluating the unit of work.

Towards the close of the year the teacher selected a number of quotations from several of the reference books used by the children. These statements were revamped and organized into true-false test form. The following statements were contained in the test:

ARCHITECTURE

Mark with a plus (+) those statements which are true; mark with a minus (—) those statements which are false.

1. One great feature of Byzantine architecture is the large central dome.
2. Architecture is an expression of civilization.
3. The Romans were the greatest builders the world has ever seen.
4. The Greeks are best known by their sculptured figures.
5. One of the chief features of Gothic architecture is the rounded arch.

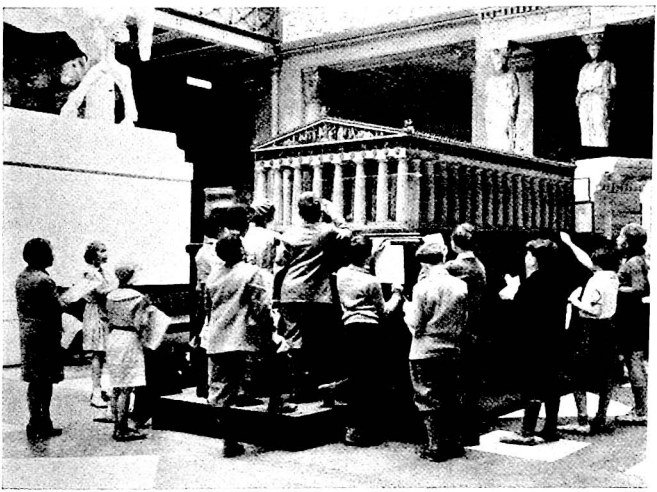
6. Romanesque is used to indicate the style of Christian architecture founded on Roman architecture.
7. Victor Hugo said, "Great buildings like great mountains are the work of centuries."
8. Norman architecture was not Gothic but Romanesque.
9. Gothic architecture grew directly from the Roman style.
10. One great feature of Roman architecture was the use of the arch.
11. The Tuscan is often called "Roman Doric."
12. The Greeks' greatest contribution to architecture was the pointed arch.
13. Life after death was not believed in by the Egyptians.
14. The four classic Greek orders are Doric, Tuscan, Corinthian, and Composite.
15. There were few elements of symbolism used in medieval architecture.
16. Greek architecture was unlike Egyptian in that it kept to the column and lintel type of construction.
17. The egg and dart molding was first introduced by the Egyptians.
18. The Egyptians used incised wall ornaments.
19. The Romans were lovers of art, literature, philosophy, music, and the drama; beauty and physical perfection were their ideals.
20. The Reel and Bead is a Gothic molding.
21. The Caryatid was used on the Parthenon at Athens.
22. The orders best known are Corinthian, Tuscan, and Norman.
23. The clustered column is a special Renaissance feature.
24. The acanthus leaf is used on the Greek and Roman Ionic columns.
25. The vulture with outstretched wings is a symbol used in Byzantine architecture.
26. The Greek and Roman acanthus leaf are identical.
27. The bead molding is a Georgian design.
28. The reason that the columns on the Parthenon appear to be even is because they are uneven.
29. The Romans built in pyramids.
30. The Woolworth building shows evidences of Romanesque influence.
31. The triglyph is the fluted section of a capital.

32. The Colosseum is a Romanesque structure.
33. The rose and the wheel window are identical.
34. Thomas Jefferson was not an architect.
35. Gothic architecture first received its name as one of contempt.
36. Both the lotus stalk and the bell type of Egyptian capitals were used at Karnak.
37. A pylon, with two obelisks and an avenue of spaces, formed the approach to the Greek theater.
38. The entablature consists of the cornice, the frieze, and the architrave.
39. A Gothic building is identified by its:
    pointed arches
    clustered columns
    traceried windows
    stained glass
    vaulted roof
    central dome
    flying buttress
    pediment
    naos
40. The Etruscans invented the vault.
41. The Romans seemed most to favor the Corinthian order.
42. Futuristic architecture will be to the future what Renaissance was to the Middle Ages.
43. A buttress is a projection from a wall to create additional strength and support.
44. Greek architecture used neither dome, minarets, nor curves.
45. The pediment is used in modern architecture.
46. Michelangelo achieved his greatest success as a mural painter.
47. Frank Lloyd Wright is one of the most conservative modern architects.
48. The Renaissance architecture is highly ornate.

Following the completion of this test the teacher discussed with the children any statement not entirely clear to them. They found exact references to substantiate or to verify the statements. The children thoroughly enjoyed this test and expressed their willingness to repeat

the experience, for this appealed to them as a combination of work, play, and puzzle.

When the children visited the Metropolitan Museum of Art, they took with them a blank test form, which they were to fill in during their inspection of the different



A VISIT TO THE MODEL OF THE PARTHENON AT THE METROPOLITAN MUSEUM OF ART. THE STUDY OF GREEK ARCHITECTURE WHICH PRECEDED THIS EXCURSION PROVIDED A BACKGROUND OF INFORMATION AND PRODUCED AN APPRECIATIVE ATTITUDE TOWARD THIS OUTSTANDING EXAMPLE OF THE PERIOD.

exhibits. This test was based on certain details which they were to observe in the different rooms. The locations of these displays were noted on each sheet of the test so that the children did not waste time floundering

through the museum trying to locate the different displays specified. Each child filled in his test as he moved about from room to room. Frequently different children compared notes on their findings, but if there was any difference of opinion they did not alter their answers until they had found sufficient reason for so doing.

The test is as follows:

GALLERY XVI

During your visit to this gallery mark or complete as directed the statements given below.

I. Hypostyle Hall—Temple at Karnak

A. Are all the small columns decorated with the same design? *Yes* or *no*.

B. List the kinds of capitals used on the columns.

C. List the ceiling decorations.

D. Find the names of the builders, Seti I and Rameses II, on each column. Make a copy of one of these names.

E. Central rows of columns have a ... . design. The capitals make use of the ..... design.

F. The central aisle has ..... rows of columns. Each row has ..... columns.

II. The Parthenon—454-458 B.C.—Athens

A. The Parthenon has Doric, Ionic, Corinthian columns. (Underline the order.)

B. Prominent external features. (Check those you recognize.)

fluted marble columns	carved antefixæ
entablature and pediment	anthemion
architrave	tympanum
frieze	metopes
cornice	façade

C. On the floor of the Parthenon stands a statue of the god Zeus, the goddess Athene, the goddess Hera. (Underline.)

D. A honeysuckle border and antefix were painted, incised, carved on this building. (Underline.)

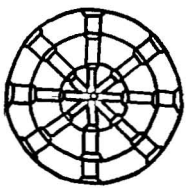
E. Each column was made of ... ... separate drums.

III. The Pantheon—Rome
   A. The Greek front was in the Corinthian style. *Yes* or *no.*
   B. The front columns are made of .... and .....
   C. The niche containing the largest statue is far from the front entrance. *Yes* or *no.*
   D. The ornament on the altar in front of this group represents a .....
   E. Prominent external features. (Check the ones you recognize.)
      Corinthian portico
      unfluted monolithic columns
      Corinthian capitals
      entablature
      pediment
      triple colonnade
      central dome
      pilaster capital

IV. Cathedral of Notre Dame—Gothic
   A. (Check all the Gothic features which you recognize on this building.)
      rose window
      flying buttresses
      pointed arches
      pinnacles
      semicircular apse
      gargoyles
      crockets
      finials
      stained glass windows
      deeply recessed doors decorated with figured sculpture

When the children returned to the classroom, they asked for the privilege of correcting the test themselves. The correct answers were given by the teacher and each child scored his own test. Since this exercise was devised to direct observation of detail rather than to test acquired knowledge, the class did not change their test results to scores or ratings.

These informal tests, based on topics presented through the unit of work, were used by the teacher chiefly as teaching devices or as means of ascertaining the amount of information acquired during the study of architecture. They were not used as measures of group accomplishment or as means of rating pupil growth. For these latter measures, standardized tests were conducted by the school psychologists at stated periods.



Chapter XI

SPECIFIC CONCEPTS AND INSIGHTS DERIVED FROM THE STUDY

In this study, many valuable concepts, generalizations, and insights were developed in addition to the broader skills and specific facts.

Architecture was, of course, the *great* concept. But, beneath this concept and contributing to it, lay a wealth of others. In order that the word might be rich in meaning, concepts of such special periods as Prehistoric architecture, Greek architecture, Modern architecture, etc., had to be developed. Nor could these concepts be truly significant unless others such as civilization, beauty, utility, need for shelter, religion, artist, artisan, and a host of other concepts had been built up.

Concepts were often embodied by the children in what they called "meaty sentences." These meaty sentences sometimes took the form of definitions, of epigrams, or of generalizations. They most often emphasized the purposes and ideals of architecture and often summarized in

compact form the content material included in the unit of work. Many of them were deduced from general discussion periods; some of them represented the independent thinking of individuals. None of these expressions were offered as conclusive evidence or final summaries; they were formulated only to indicate the trend of thinking and served to express impressions and appreciations. The following statements are quoted to show, first the breadth and variety of expressions set down by the children and, second, to present some of the concepts embodied in them.

Architecture is a reliable record of people's activities.

Good architecture should be a combination of beauty and utility; but most architects think of beauty as being most important.

Architecture is a record of the beliefs and lives of people in a given period.

Architecture, in most cases, is man's means of fortifying himself against turbulent conditions.

Most architecture is an expression of man's longing for beautiful things.

Architecture is like a flowering tree. It develops from a homely root into a strong-branched tree. Then in time new buds appear; slowly they blossom full and glorious only to die and fade away. Soon, however, another bud appears to repeat the beauty of the tree.

Architecture expressed through the science of building is the story of race competition and conquest.

A style of architecture can never be duplicated exactly in another period, for by so doing it would be a misrepresentation of the ideals of its creators.

Beauty as expressed through our building is not the creation of an original artist. All beauty is borrowed from the art of the past.

Architecture reveals the emotions of races. When people live in peace and harmony, their architecture is calm and beautiful. When hate and greed drive nations to war, their architecture is restless and grotesque.

Architecture is a form of expression more descriptive than words.

Architecture relates to us the history and social development of the world in a manner as forceful and as clear as that used by some of our old historians.

Architecture is one of the insights of life.

Architecture is an art which can be expressed through an unlimited variety of materials.

True architecture does not pretend to be something that it really is not.

To intelligent people, architecture needs no praise.

The more one studies architecture, the more it comes to life.

Architecture is an art understood not only by the learned and the artistic, but by everyone in his own way.

If it had not been for the periods of architecture previous to that of the present civilization, there would be no such thing as modern architecture. Each race and period of development contributed, through its great enterprise and experimentation, a share towards our present state.

If one style of architecture did not differ from other types or styles, architecture would be a most uninteresting art.

Architecture tells a story as effectively as the words of a book.

Architecture has more mystery, beauties, and delights than noble minds have been able to express.

What a nation builds shows what its chief interests are.

A beautiful and original piece of art has as much reason for being as a scientific theory.

There is no need for praising or justifying architecture to people who love beauty.

If the beauty of architecture was appreciated by most people the world would be a more beautiful place in which to live.

The different periods of architecture are formed not only

by knowledge, skill, and ability to design and produce beautiful buildings, but by the tastes of the people.

The beauty of architecture is developed as man learns more.

Sentiments are expressed in architecture as well as in poetry.

There is imitation as well as creation in architecture.

Architecture is man's activities (or words) symbolized in stone.

Architecture is stillness in motion.

Architecture is the slow motion picture of the world.

Most architecture was developed through man's need for shelter.

The Egyptians did not build their temples so that their gods could see them, but that these gods could feel stability in the beliefs of the people.

A skin tent or a modern skyscraper are both outstanding types of architecture.

The architecture of the Greeks and the Romans might be called the keystones of all architecture.

To model the Parthenon without its frontal frieze and statuary would be like trying to model a man without his head.

Renaissance was the christening of a new architecture.

Changes of style are due to necessity.

Gothic architecture is forever pointing heavenward.

Sometimes a change of style is due to more knowledge.

Architecture, in its way, helps to determine the character of a city.

The architecture of the future is still in a mist.

Modern architecture is a great boon to the commercial advertiser. It is the one architecture that is *influenced* by its surroundings and, in turn, exerts a strong influence upon its environment.

One child formulated quite a number of very unusual and very outstanding statements. The class enthusiastically voted that her contribution was significant and helpful to those who had not as yet been able to express

their convictions in words. The insights of this individual child are here reproduced:

Beauty is all around us if we could only see it.

There would be no different types of architecture if it were not for people's differences in opinion.

Architecture serves two purposes—one as a recorder of history and also as something that makes the world more beautiful.

In architecture we not only find beauty, but as in other arts we also find many things that do not appeal to our taste.

Greek architecture is as perfect as the song of the nightingale.

Greek architecture "is simply perfect because it is perfectly simple."

Gothic architecture with its uplifting feeling was intended to lift the soul to heaven.

Modern architects are quite like Romans, for the Romans when they captured the Greeks took over the Greek style of architecture, modified it and combined it to suit their taste. The modern architects take practically any style and combine and modify it to suit their taste.

Modern architects have many an advantage over ancient architects, for nowadays we have more scientific knowledge and a variety of construction materials without which modern architecture would be entirely changed.

In addition to formulating statements about architecture, each class also searched out many quotations about this art. They were culled from many sources—literary, commercial, historical, architectural, and scientific. As each child found a challenging or a meaningful quotation he copied it on a card which was later filed in a special card catalogue set aside for this purpose. Later many of them were analyzed for the purpose of defining the

term *architecture*. Some of the most outstanding of these quotations are listed below:

We may live without architecture, and we may worship without her, but we cannot remember without her.

RUSKIN.

When we build, let us think that we build forever.

RUSKIN.

Art is merely the embodiment of the dominant influence of an age. GEORGE MOORE.

Art does not represent things falsely, but true as they appear to mankind. RUSKIN.

Architecture is a species of language. It tells us as much of Greece as Homer did, and more of the middle ages than has been expressed in literature. EIDLITZ.

Architecture is the printing press of all ages, and gives a history of the state of society in which it was erected.

MORGAN.

The more you spend on architects, the less you will have to spend on prisons. JOHN BURNS.

We cannot look at works of art but they teach us how near man is to creating. Michaelangelo is largely filled with the Creator that made and makes men. . . . each one, competing with Phidias and Raphael in the production of what is graceful and grand. EMERSON.

The exquisite adaptation of Greek building to Greek landscape has been enhanced rather than impaired by the lapse of time. JOHN ADDINGTON SYMONDS.

Great buildings, like great mountains, are the work of centuries. VICTOR HUGO.

Reader, if you would see my monument, look around you.
Inscription on the tomb of Christopher Wren.

The lesson taught by the study of Greek and of Gothic art, is that all beauty must be organic. The outside embellishment is deformity. EMERSON.

Beauty old yet ever new
Eternal voice and inward mood.
WHITTIER.

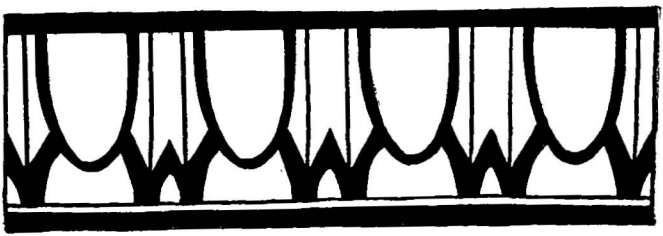
Wealth ficke flies away,
But art remaining with thee doth stay.
CATO.

Architecture can want no commendation where there are noble men, or noble minds. SIR HENRY WOTTER.

While the various enterprises and activities were being developed through the unit of work, the children were building up other concepts and insights of a more general nature. These were concurrent with the learnings evolved through the dominating theme of the unit and were frequently the outgrowths of some stimulating experience in the discussion or study periods. The activities of the unit were the nuclei of the learnings but, from them and through them, emanated direct and indirect outcomes. The direct outcomes were evidenced by growth of individuals and of the group in the interpretation of architecture. The other more indirect outcomes were evidenced by personal reactions brought out through social relationships and group purposes. These latter outcomes were demonstrated by such learnings as the evaluation and establishment of better social attitudes and habits, the application of study suggestions, the evaluation of

self-effort, the necessity for unified purpose and coöperation, the more intelligent appreciation of the workers, the more sympathetic and understanding view of social classes, and the fuller, richer interpretation of values.

In addition to these concomitant learnings the children's concepts extended by means of new experiences in their routine class work. Drill in penmanship, in spelling, in reading, or in arithmetic gradually ceased to be monotonous rote work for it had purpose; that is, it had purpose because the child felt that he needed these tools to help him interpret and express his reactions to the unit of work. Menial and irksome duties in connection with the activities of the unit were assumed readily because the progress of the work depended upon systematic attention to these details. The artisans' and laborers' humble efforts assumed dignity because the children experienced many of the processes in which they engage. They found that success of any undertaking or production depends not upon the creative ability of the one person, but also upon the coöperative and interdependent efforts of all concerned in the enterprise.



Chapter XII

A CONTENT OUTLINE OF THE UNIT

ONE can readily see that the content possibilities of this unit of work are limitless for they draw upon every phase of human activity, pursuit, and interest. The story of all civilizations forms the structure around which the study is built. It likewise supplies the background for a real appreciation of man's endeavor, for it presents a cross section of life and development in all times, under all conditions, and from many sources.

While analyzing the unit for her pre-view the teacher decided that a complete and detailed history of architecture was too broad a theme and too advanced a study for sixth grade children. Consequently she tried to select such topics as she thought were outstanding and which showed the most significant influence in architectural development in our present everyday life. This limited the content of the unit to a consideration of basic periods and the circumstances under which they evolved. Before the opening of the school year the teacher made an out-

line of the topics and facts which she felt were helpful for her to have in mind as a basis for an understanding of the growth of this art. This outline appears on pages 283 to 300. It indicates the richness of such a study and implies possibilities for those who wish to broaden their knowledge of world architecture. The omission of such periods of architecture as Chinese, Saracenic, Indian, and other well-known styles is not an oversight. They were omitted purposely, either because they had little influence on subsequent building or because they were adaptations and modifications of more original styles.

As has already been stated, this outline was first made by the teacher during her initial pre-view of the unit. After the unit was initiated with the class she revised, supplemented, and simplified the topics to fit the conceptions and needs of the children who carried on the study. This formal presentation of topics was not given to the classes, but was developed by the teacher as one form or organization of the material upon which the unit might be based. All the material indicated was not taught nor, as has already been explained, were the general topics developed in the chronological order indicated. The outline includes many more details than were thought necessary to be taught. The reader must bear in mind that the teacher felt the necessity to note as many topics as possible for her own preparation for and approach to the unit. Thus her outline became by inference a detailed and comprehensive view of world history. It is included here only to show the number of possibilities for developing the unit and to indicate the far-reaching influence of architecture in the story of changing civilizations.

It must not be interpreted as a compendium of the subject matter which the teacher had *mastered* before the unit was taken over by the children. It is her belief that such a complete preparation would have detracted from the development of the topic with the children for, to be truly valuable, she believes that *life* is best imparted to a unit when the children and the teacher together enjoy and profit by adventuring in the material of the unit. She also feels that a unit has greater educational possibilities when the children and the teacher together are students of the problem, experimenting with the materials of the unit, suggesting and studying better approaches to the topic, and building up interpretations and appreciations as the story unfolds.

Since this plan for the unit was prepared primarily for New York City children, the examples of architectural forms referred to are chiefly those in the child's urban environment. Had the outline been prepared for general use, specific references would have been made to buildings more universally known.

Outline of Study for This Unit of Work

I. Egyptian Architecture—5000 B.C. to 115 B.C. (Map—Egypt)
  A. Characteristics
    1. Essential features
      a. Colossal size
      b. Solidity
      c. Stability
      d. Jointed masonry, battering walls, oblique joints
      e. External wall slope
    2. Chief ornaments
      a. Lotus flower
      b. Papyrus bud

c. Palm foliage
d. Sacred boat (Thebes)
e. Winged solar disc
f. Column ornamentation
1) Papyrus bud
2) Lotus flower and bud
3) Feather
4) Hathor head
5) Palm
6) Composite
7) Bell
8) Volute
9) Osiris pillars
g. Coil and spiral patterns
h. Rope and feather patterns
i. Bead or roll molding
j. Low relief carving and color incised relief
k. Hieroglyphics

B. Leading examples
1. Pyramids (Great pyramids of Cheops or Khufu at El Gizeh, B.C. 3733, most noted)
2. Tombs
a. Rock cut (Beni Hassan B.C. 2500)
b. Mastaba of Thi, Sakkâra
c. Tomb of the Kings at Thebes
d. Tomb of Seti I
e. Tomb of Tut-ankh-Amen (B.C. 1400)
3. Palace Temples
a. Temple of Khons, Karnak (B.C. 1200)
b. Great Temple of Ammon, Karnak
c. Great Temple, Abu-Simbal (B.C. 1330)
d. Temple of Seti I, Abydos (B.C. 1350)
4. Obelisks
a. Luxor
b. Memnon of Thebes
5. Great Sphinx

C. Modern Examples
1. Entrances to cemeteries (occasionally)
2. Tombs (frequently)
3. Bridges, etc.

II. Western Asia Architecture—Babylon, Assyria, Chaldea, Persia, 2000-500 B.C. (Map—Western Asia)
   A. Characteristics
      1. Essential features
         a. Buildings on elevated platforms
         b. Buildings and obelisks of diminishing terraces
         c. Use of burnt and sun-dried bricks and huge blocks of cut stone
         d. Vertical walls
         e. Flat roofs (Assyria and Persia)
         f. Vaults and domes (Babylon)
      2. Chief ornaments
         a. Capitals of double-headed animals, horses, lions, etc.
         b. Representations of war scenes, battles, hunting scenes, etc.
         c. Use of rosette flower in borders and in patterns
         d. Carved alabaster slabs and colored tiles
         e. Winged deity
   B. Leading examples
      1. Tower of Babel (Babylonian)
      2. The Ziggurat, Bars-Nimroud (Babylonian)
      3. Tomb of Cyrus (Persian)
      4. Hall of Xerxes (Persian)
      5. Tomb of Darius (Persian)
      6. Hall of the Hundred Columns (Persian)

III. Greek Architecture—460-100 B.C. (Map—Greece)
   A. Characteristics
      1. Essential features
         a. Simplicity of design
         b. Perfection of proportion
         c. Dignity of form
         d. Symmetry of line
         e. Use of marble or limestone
         f. Rectangular temples
         g. Sloping roofs
         h. Friezes and pediments
         i. Column and lintel construction
         j. Columns and spreading capitals
         k. Sculptured decorations
         l. Use of painted or colored decorations

2. Chief ornaments
   a. Leaf and dart
   b. Egg and dart
   c. Bead and reel
   d. Anthemion or honeysuckle
   e. Acanthus leaf
   f. Fret
   g. Guilloche (a circular interlaced ornament like network)
   h. Dentils far apart (take up whole depth of molding)
   i. Flutes
   j. Griffin at end of pediment
   k. Torus—Bird's beak
   l. Volutes
   m. Triglyph
   n. Abacus
   o. Metope
   p. Plinth
   q. Sculptured friezes and pediments (pointed, curved, broken)
   r. Entablature
   s. Caryatids
   t. Tympanum

B. Leading examples
   1. Gate of Lions at Mycenæ (B.C. 1200)
   2. Parthenon at Athens (B.C. 454-438)
   3. Erechtheum at Athens (B.C. 420-393)
   4. The Temple of Zeus at Olympia (B.C. 472-469)
   5. Temple of Artemis at Ephesus (B.C. 356) (regarded as one of the Seven Wonders of the World)
   6. The Mausoleum at Halicarnassus (B.C. 353)
   7. The Agora at Olympia
   8. Theatre of Dionysius at Athens (B.C. 340)

C. Modern examples
   1. Upper front of Rivoli Theatre, New York City
   2. Field Museum, Chicago, Illinois
   3. Union Square Savings Bank, New York City
   4. Savings Bank of Baltimore, Maryland
   5. U. S. Treasury (Ionic), New York City
   6. U. S. Patent Office (Doric), New York City

IV. Roman Architecture—B.C. 146-A.D. 365 (Map—Roman Empire)
  A. Characteristics
    1. Essential features
      a. Vast size
      b. Magnificence
      c. Use of concrete (Romans were the inventors of concrete)
      d. Utilitarian structures: bridges, aqueducts, etc.
      e. The arch, vault, dome (the keynotes of Roman construction)
      f. Semi-circular-headed doors and windows
      g. Colonnades and arcades
      h. Niches for statues
      i. Post and lintel engineering
    2. Chief ornaments
      a. The Acanthus scroll
      b. Acanthus frieze
      c. Torus
      d. Guilloche
      e. Rosettes
      f. Columns
        1) Ionic
        2) Doric
        3) Corinthian
        4) Engaged
        5) Roman Doric
        6) Tuscan
        7) Composite
      g. Architrave
      h. Keystone
  B. Leading examples
    1. The Maison Carrée, Nimes (A.D. 14)
    2. Temple of Diana, Nimes
    3. Temple of Vesta, Tivoli (B.C. 27-A.D. 14)
    4. The Pantheon at Rome
    5. The Colosseum at Rome (A.D. 70-82)
    6. Triumphal arches
      a. Arch of Titus at Rome (A.D. 81)
      b. Arch of Constantine at Rome (A.D. 312)

c. Modern examples
1. Pennsylvania Station, New York City
2. Notre Dame Church, New York City
3. Knickerbocker Trust Company, New York City
4. Columbia University Library, New York City

V. Byzantine Architecture—4th Century A.D. to present time
A new direction was given to architectural development by the transference of the capital of the Roman Empire from Rome to Byzantium (later re-named Constantinople; now known as Istanbul). The new style of architecture evolved was known as Byzantine and became the accepted style of the Eastern or Greek Orthodox Church.

A. Characteristics
1. Essential features
a. Domed roofs covering circular, polygonal, and square structures
b. Many domes and semi-domes over one building
c. Use of concrete and brick work
d. Exterior corresponding with interior
e. Columns used to support weight
f. Many small windows
2. Chief ornaments
a. External façades sometimes oblique in form of meander fret, chevron, or herringbone pattern
b. Domes with colored glass mosaics on gold background
c. In the absence of moldings and cornices, the mosaic designs and pictures continued uninterrupted over wall surfaces, piers, arches, domes, and apses
d. Walls (rich-colored marbles, shining glass mosaics)
e. Domes (three types: simple, composite, melon-shaped)
f. Columns used constructively (Roman, Ionic, Corinthian, and Composite principal types, but from these there derived a new cubiform type with convex sides)
g. Bud and basket capitals
h. Moldings little used because the mosaic work ran continuously
i. Ornamentation elaborate in the extreme

j. Lavish use of color
k. Mosaic pictures of symbolic figures, groups of saints, the peacock (immortal life), etc.
l. Endless knot pattern (emblem of eternity)
m. Incised ornamental patterns

B. Leading examples
1. St. Sophia of Constantinople (A.D. 532-537)
2. St. Irene at Constantinople (A.D. 740)
3. St. Marks of Venice (A.D. 1042-1071)

C. Modern examples
1. Unitarian Church, Fourth Avenue, New York City

VI. Romanesque Architecture—5th to 13th Century
A. Characteristics
1. Essential features
a. Transepts added to plan of basilica
b. Churches cruciform in plan
c. Round-headed doors and windows
d. Round windows
e. Doors recessed
f. One or more towers (square, octagonal, or circular)
g. Choir raised above a crypt
h. Use of rose window
i. Decorated façades
j. Cushioned-shaped capitals
k. Vaulted roofs using semi-circular arches
l. Flying buttresses under aisle roofs
m. Thick walls and comparatively small openings
n. Arcaded galleries
o. Detached towers or campanili
2. Chief ornaments
a. Grotesque figures, foliage, and animal forms
b. Brilliant coloring
c. Adaptations of Byzantine and Roman forms
d. Use of frescoes
e. Elaborately carved moldings
f. Carved tympana
g. Christian symbolism in decorative carving
h. Elaborately modelled bronze doors (external)
i. Variations of Corinthian and Ionic columns

j. Norman influence in English Romanesque
k. Types of ornaments
1) Saw tooth
2) Diamond
3) Chevron
4) Billets
5) Scallop or fish scale
6) Lattice or basket
7) Corbel heads
8) Nail heads
9) Pellets

B. Leading examples
1. Pisa Cathedral (Italian) (A.D. 1063-92)
2. Angoulème Cathedral (French) (A.D. 1105-28)
3. Worms Cathedral (German) (A.D. 1110-1200)
4. The Church of St. Gilles (French) (A.D. 1150)
5. Durham Cathedral (English) (A.D. 1096-1133)

C. Modern examples
1. St. Bartholomew's Church, New York City
2. Trinity Church, Boston, Massachusetts
3. Capitol, Albany, New York
4. County Building, Pittsburgh, Pennsylvania

VII. Gothic Architecture—A.D. 1200-1500.

Gothic architecture is vigorous, daring, and dynamic. It holds an emotional rather than an intellectual appeal. It is free, flexible, and graceful.

The early cathedral was the textbook of the masses. Indeed, it took the place of books. It was a great stone encyclopedia of the people until the coming of the printed book.[1] Few of those who saw these cathedrals built could read or write. Their geography was largely that of saints or rulers. Their science was largely that of the alchemist or the astrologer. Their literature was found chiefly in the scriptures and in the writings of the Church Fathers.

At the beginning of the 13th century the round arch gave way to the pointed arch and greater freedom was allowed. The name *Gothic* was given to the new and robust style of

[1] Adapted from Smith, David E., *Mathematica Gothica*, published by the author, Teachers College, Columbia University, New York City.

the North. The term was intended as one of reproach—one that should brand as uncouth and barbarous the product of the unrestrained Goth. But, within a century, the term finally attained an eminence of highest dignity, standing for the noblest ecclesiastical architecture that the world has ever known.

A. Characteristics
  1. Essential features
    a. Pointed lancet arch
    b. Arcades
    c. Stone buildings
    d. Windowed walls flat on interior
    e. Lofty ribbed vaulting
    f. High-pitched roofs (French)
    g. Flying buttresses
    h. Tapering spires and pinnacles
    i. Stained glass
    j. Rose windows
    k. Traceried windows
    l. Gargoyles
    m. Tombs carved with spires
    n. Clustered columns
    o. Finials
    p. Crockets
    q. Transcepts
    r. Circular windows
    s. Color decorations on walls
  2. Chief ornaments
    a. Symbolic design
    b. Realistic use of nature
    c. Deep shadows
    d. Color decoration
    e. Stained glass
    f. Canopied niches for sculptured niches
    g. Quatrefoil, trefoil, cinquefoil
    h. Dog-tooth ornaments
    i. Wall flowers and vines
    j. Four-leafed flowers and square flowers
    k. Tudor rose
    l. Portcullis

B. Leading examples
1. English
   a. Salisbury Cathedral (A.D. 1220-58)
   b. York Cathedral (A.D. 1261-1324)
   c. Wells Cathedral (A.D. 1180-1425)
   d. Westminster Abbey at London
      1) Founded A.D. 1016
      2) Partly rebuilt A.D. 1055-65
      3) Greater part rebuilt A.D. 1269
2. French
   a. Rheims Cathedral (A.D. 1212-41)
   b. Amiens Cathedral (A.D. 1220-88)
   c. Notre Dame, Paris (A.D. 1163-1235)
   d. Chartres Cathedral (A.D. 1194-1260)
   e. Château de Pierrefonds (A.D. 1396)
   f. Carcassonne (fortified town built in thirteenth century)
   g. Hôtel de Cluny, Paris (A.D. 1485)
3. German
   a. Cologne Cathedral (A.D. 1248-1322)
   b. The Frauenkirche, Nuremberg (A.D. 1354-61)
4. Italian
   a. Milan Cathedral (A.D. 1385-1485)
   b. Florence Cathedral (A.D. 1296-1462)
   c. The Doge's Palace, Venice (A.D. 1309-1424)

C. Modern examples
1. St. Thomas' Church (13th Century Gothic), New York City
2. St. Patrick's Cathedral
   a. Vaulting—English
   b. Spires—German
   c. Plan—French
   d. Tracery in windows—German and English
3. Trinity Church, New York City
4. Grace Church, New York City
5. Cathedral of St. John the Divine, New York City
6. Vanderbilt's home (flamboyant Gothic), New York City
7. Woolworth Building (detail), New York City

VIII. Renaissance Architecture—15th to 18 Centuries

This period of architecture, sometimes spoken of as the reversion to classical styles, started in Italy about the middle of the fifteenth century. From Italy the movement spread westward through other countries during the sixteenth century. The development of the style followed the intellectual movement in literature, which had been stimulated by the invention of printing and the spread of knowledge.

A. Characteristics
   1. Essential features
      a. Symmetry of plan
      b. Simplicity of outline
      c. Towers used sparingly
      d. Rusticated masonry
      e. Semi-circular vaulting without ribs
      f. Spacious naves
      g. Adapted Roman orders (Tuscan, Doric, Ionic, Corinthian, and Composite)
      h. Roman arches
      i. Round-headed small windows
      j. Heavy projecting cornices crowned with
         1) Statuary
         2) Domes
         3) Balustrades
         4) Broken pediments
      k. Colossal columns extending through several stories
      l. Use of pilasters
   2. Chief ornaments
      a. Adapted from Greek and Roman mythological subjects
      b. Exquisite carving and metal work
      c. Frescoe painting
      d. Gilding
      e. Scrolls
      f. Shields
      g. Garlands and swags
      h. Festoons
      i. Wreaths of fruits and flowers
      j. Cupids and angels
      k. Musical instruments

B. Leading examples
1. Italian
   a. Florence Cathedral (A.D. 1420-34)
   b. Palazzo Riccardi, Florence (A.D. 1430)
   c. Palazzo Strozzi, Florence (A.D. 1489)
   d. Palazzo Pitti, Florence (A.D. 1435)
   e. Vatican Palace, Rome (A.D. 1486-92)
   f. St. Peter's Church, Rome (A.D. 1506-1626)
   g. The Capitol, Rome (A.D. 1540-1644)
   h. Library of St. Marks, Venice (A.D. 1536)
2. French
   a. Palais de Fontainebleau (A.D. 1528)
   b. Palais de Versailles (A.D. 1661-1756)
   c. Palais du Louvre, Paris (A.D. 1546-1878)
   d. Palais des Tuileries, Paris (A.D. 1564-1680)
   e. Château de Blois (A.D. 1508)
   f. Petit Trianon, Versailles (A.D. 1762-68)
   g. St. Etienne de Mont, Paris (A.D. 1517-38)
3. German
   a. Castle Heidelberg (A.D. 1531-1612)
   b. Rathhaus, Altenberg (A.D. 1562)
   c. Pellerhaus, Nuremberg (A.D. 1605)
   d. Salzburg Cathedral (A.D. 1614-28)
   e. Castle Stuttgart (A.D. 1553)
4. English
   a. Haddon Hall, Derbyshire (A.D. 1567-84)
   b. Banqueting House, Whitehall, London (A.D. 1619-1621)
   c. Jesus College, Oxford (A.D. 1571)
   d. Kensington Palace (A.D. 1690-1704)
   e. St. Paul's Cathedral, London (A.D. 1675-1710)
   f. Somerset House, London (A.D. 1776-86)
   g. St. Mary-le-Bow, Cheapside (A.D. 1671-1680)
   h. Radcliffe Library, Oxford (A.D. 1737-1747)

C. Modern examples
1. Herald Building (Italian), New York City
2. City Hall (English), New York City
3. Public Library (Florentine), New York City
4. Tiffany Company Building (Venetian), New York City
5. Pennsylvania Station (Roman), New York City

IX. American Architecture—Colonial period to about 1900

America had to create her own architecture. She had to choose from a vast number of foreign influences. America was first subjected to English and Dutch traditional influence. Before the Civil War most of the Colonial buildings were adapted from the English Georgian style.

The architecture of the North was adapted to meet commercial and utilitarian purposes. It was highly individualistic, fitting the needs of the people.

Those sections settled by Spanish colonists reveal through their building the extent of Spanish Renaissance influence.

The United States, like the nations of Europe, passed through progressive periods of architecture. Thus her buildings reflect some of the features of Romanesque, Gothic, and Renaissance styles.

The industrial development and the use of new materials brought about demands for new types of buildings known as *skyscrapers*. These, while in great contrast to buildings in other countries, were based on traditional elements and decoration. In them the classical features predominated. The skyscraper, however, shows a much greater freedom of expression.

A. Characteristics
   1. Essential features
      a. Adaptations of historical styles
      b. Domestic structures generally built of wood
      c. Use of verandahs, staircases, loggias, and steep roofs in homes
      d. Early churches similar to those designed by Christopher Wren (England)
      e. Government buildings of monumental style
      f. Later urban business buildings of skyscraper type
      g. Use of steel frame structure
      h. Use of labor-saving devices
      i. Masonry, brick, or terra cotta later building materials
   2. Chief ornaments
      a. Generally adapted from Classical or Gothic
      b. Colonial homes made free use of Georgian period
      c. Classical orders adapted and modified
      d. Adapted decorative details

e. Doorways noteworthy—many of them original, but most of them adapted
f. Shuttered windows and mansard roofs in many Colonial homes
g. Moldings adapted from historical styles
h. Towers used in many commercial buildings
i. Decoration suited to the purpose of the building
j. Frequently many features of historic styles combined in one building

B. Leading examples
a. Craigie House, Cambridge, Massachusetts (Colonial)
b. St. Paul's Church, New York City (adapted Gothic)
c. Trinity Church, New York City (Gothic)
d. St. Patrick's Cathedral, New York City (Gothic)
e. New York Public Library, New York City (Renaissance)
f. Pennsylvania Station, New York City (Roman Classical)
g. Columbia University, New York City (Roman Classical)
h. The Capitol, Washington, D. C. (Roman Classical)
i. Congressional Library, Washington, D. C. (Renaissance)
j. City Hall, New York City (Gothic detail)

X. Modern Architecture—Emergence

From the development of new features in American architecture, there grew a movement to break away from traditional styles. Architecture began to speak in a language of its own. Buildings no longer were copies or adaptations of ancient forms. They began to express the age in which they were built. The use of new building materials helped to foster this ambition. Structural iron and steel used for framework demanded a new external treatment. The skyscraper is a utilitarian building and must not be made to look like a temple or a Gothic cathedral. Their construction principle is founded on the functional purpose for which the building is erected.

America was the pioneer in this new architectural expression. Other nations gradually came to accept some of the

structural principles of the new style, but they found little need for the skyscraper. Excepting in the poorest sections, the cities of other countries were not so congested as our American cities, and they had room to expand horizontally. American cities, on the contrary, had but one direction in which to build and that was vertical. Skyscrapers erected in a single city block began to house thousands of workers and these buildings became centers of industry, trade, and finance in our cities. Soon after the first skyscraper office building appeared, tall apartment houses were erected and became the homes of these workers. From about 1890 to the present time, skyscrapers have increased in height and have been improved and perfected until our modern cities are veritable citadels of towering buildings.

The term *modern architecture* came into use during the latter part of the nineteenth century. The buildings typical of the early part of the current era differ essentially from the examples of the modern style which now predominate in our American architecture. The early buildings, though different in form, were still dominated by traditional elements.

Outstanding examples of these buildings are:

The Woolworth Building, New York City (Gothic skyscraper)
The Public Library, New York City (Renaissance)
Library of Columbia University, New York City (Roman and Greek combined)
The Post Office, New York City } Adaptations of the
National Museum of Art } Classic Temple
Stock Exchange }

Some of the names of architects associated with the launching of this new architectural era are:

H. H. Richardson
Richard Upjohn
J. Russell Pope
Cass Gilbert

X. Modern Architecture—(continued)—Development

From this new freedom in architectural expression there developed a style which today we still call modern but which rejected many of the traditional elements of the early era of

modern architecture. The skyscraper became more artistic and magnificent. The style is associated chiefly with America and has come to be known as American architecture. Gradually European nations are adopting certain features of this style. In Germany, Italy, and in the Scandinavian countries many of the newer buildings show distinct adaptations of the commercial skyscraper of America. Our buildings continue to rise to greater heights while in European cities they have not been built so high. Economic conditions, convenience, and practicability are the influences which force our buildings to assume such proportions.

XI. Architecture of the Future

Futurism as a distinct movement had its rise in Italy during the late Renaissance period. The new style, though based on classic forms, designed the buildings to fit the needs and demands of the age. It was the *modern* architecture of its age, the inspiration of the later architects who developed the style which today we call *modern.* The name *futurism* as applied to Italian Renaissance derives its meaning from but one aspect of the movement, this is, entire separation from the past.

Futurism in architecture today has based its doctrine on the scientific theory that all nature is *energy.* The purpose of the artist is therefore to *suggest* this *energy,* to picture "not the energy but the go." Lines, materials, and color are to be used to produce this sensation.

America leads the architectural activities of the world in evolving this new and distinctive style. By studying the examples of ultra-modern buildings we can predict some of the developments most likely to appear in the architecture of the future. Some of these prophecies are:

A. Characteristics
   1. Essential features
      a. Buildings of great height in urban communities
      b. Skyscrapers built in groups of related buildings
      c. Buildings connected by means of subsurface streets and overhead lanes
      d. Residence skyscrapers built around parks, and playgrounds and recreation centers

e. Utilitarian purposes of buildings
f. New use of materials
1) Structural steel framework
2) Glass
3) Metal walls replacing masonry
4) Huge metal slabs, bars, or sheets, made to fit definite spaces
a) Cast and cut in advance and fitted in place as a unit when external facing is applied
b) Welding eliminated
c) Time for construction lessened
g. Suburban and rural homes built for maximum comfort and efficiency
h. Separate homes built to fit surroundings and providing for a maximum of
1) Sunshine
2) Air
3) Light
4) Space for outdoor activities, gardens, etc.

B. Chief ornaments
1. Minimum of impractical non-functional decoration
2. Flat colored walls into which horizontal rows of windows are set
3. Metal bands, bars, and perpendicular strips
4. Carvings and surface motifs indicative of the function of the building

C. A few architects whose work will influence futuristic architecture:
1. Frank Lloyd Wright
2. Ralph Walker
3. Raymond Hood
4. William P. Lamb
5. Harvey Wiley Corbett, etc.

D. Examples of ultra-modern architecture showing tendencies which forecast the future style
1. Empire State Building, New York City
2. Radio City Group, New York City
3. Chrysler Building, New York City
4. New York Telephone Building, New York City
5. The News Building, New York City, etc.

In the foregoing section, a number of possible topics for the development of the unit are suggested. In the preceding chapters, the reader sees how some of these topics were used by the children, and how certain kinds of activities and learnings were developed through them. The following pages present some of the actual subject matter content which helped the children to solve problems arising in connection with their study of world architecture or to carry on activities related to some phase of the unit of work.

SOME CONTENT MATERIAL WHICH HELPED TO SOLVE PROBLEMS ARISING IN CONNECTION WITH THE UNIT OF WORK

Arithmetic

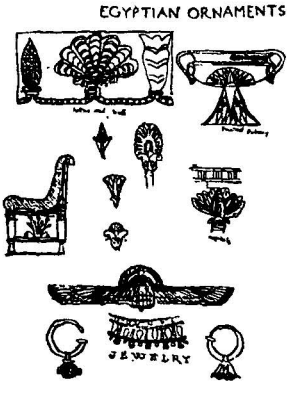
- Geometric design based on rose, and wheel window symmetry
- Circles (their area), angles, triangles
- Strength of triangles and their uses in building
- Mathematics of the cathedral
  - Broken arches, thrusts, counter-thrusts; vaulting; symmetry; pointed arches; flying buttresses; triforium; mystery of numbers, 3, 7, etc., and their use in churches
- Graphs showing architectural periods—time span
- Trusses and arches
  - The triangle as a geometric form holding its shape; tension and compression; distribution of pull; comparison of other geometric forms
  - Kinds of trusses: lattice, scissor, lenticular, panel, beam, hammer, etc.
- Practical problems as outgrowths of discussions about:
  - The comparative costs of land in New York at the present time and in its earlier history
  - Rate of taxation for New York City property
  - Costs of erecting a skyscraper
  - Cost of property in New York City
  - "Set-backs" on New York City's newer buildings
  - An architect's plan (drawing to scale, measurement, etc.)
  - Cost of architect's plan: if used; if not used

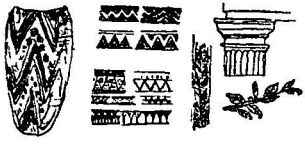
The modern skyscraper: dimensions, footage, habitable space, idle floor space, excavation, quantities of materials used, planning for ventilation and sanitation

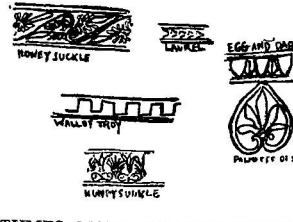
Buying textile materials for costumes and stage settings
Costs of other materials used for plays
Buying and selling experiences through: school sales, "picture shop" (pages 104 to 109), bazaar activities, the book mart (pages 317 and 322)
Computing expenses for trips; how to facilitate a successful excursion
The use of a pantograph, etc.

Industrial, Household, and Fine Arts

Constructing a model of the Pantheon to show how domed roof was built
Making keystone, first of wood, then using wider piece as background for design modeled in plasticine
Making blue prints of architectural details
Making trusses showing triangles, how they are used in building bridges, roofs, etc.
Constructing different types of trusses; bowstring, scissor, lattice
Showing different types of geometric forms, proving that most of them lose their shapes while the triangle keeps its shape
Making a rose window; designing pattern, selecting colors, cutting glass, soldering
Making cast of architectural details
Making a mold for a cast
Cutting stencils of architectural forms for a shadowgraph assembly
Making stage properties for plays: vender's cart, designing and painting background and settings, designing and making costumes
Making frame on which to show stencil patterns for shadow pictures
Selecting architectural details in costume and design
Designing and making costumes
Making programs for plays
Making a clay model from which cast was made







TRACINGS OF HISTORICAL COSTUMES MADE BY THE CHILDREN. THE IMPETUS FOR THIS ACTIVITY WAS FURNISHED BY A DESIRE TO DISCOVER, IF POSSIBLE, MOTIFS COMMON TO HISTORICAL COSTUME AND TO ARCHITECTURE.

Designing, cutting, and printing linoleum and wood block prints
Printing kodak pictures
Making booklets
Making sketches and designs showing how the children would improve upon the plans for New York City buildings
Making wall plaques
Designing keystone
Arranging architectural details in blue prints
Creating a design for notebook cover
Teaching perspective (a request from some of the most artistic pupils to be taught perspective because they needed to know it in order to show better what they wished to express on a program cover
Designing and making personal symbols
Designing and suggesting coloring for a section of the rose window
India ink sketches for notebook illustrations
Sketching designs from buildings and models
Lettering and printing for labels and signs

History and Geography—the history of architecture
Influences responsible for the evolution of architecture in different periods and nations: geographical, geological, climatic, religious, social, historical. How each influence helped to evolve the outstanding styles of architecture
Historical styles of architecture chronologically developed:
Prehistoric
Egyptian
Greek
Roman
Byzantine
Romanesque (in Europe)
English
French
German
Italian
Gothic (in Europe)
English (also called English Mediaeval)
French
Belgian and Dutch

German
Italian
Spanish
Renaissance (in Europe)
Italian
French
German
Belgian and Dutch
Spanish
English
Modern
American
Italian
German
Scandinavian
French
English
Futuristic prophecy of new developments

A brief survey of the history and geography of nations responsible for developing outstanding differences in architectural forms:
Historical influences
Need for buildings
Outstanding historical events
Governmental and political influences
Religious beliefs
Social traditions
Ideals of the people
Cultural development
National and civic life
Domestic development
Geographic influences
Location (use maps)
Topography—why buildings are adapted to environment
Sources of building materials: native, imported—transportation routes
Climate: how it influences types of buildings; how it influences the use of building materials
Outstanding buildings of leading nations
Architectural character

Comparative analysis
  Identifying characteristics
  Structural features
  Ornamentation
  Examples: location, period, date of construction, condition to-day
Special qualities of each style
Artisans, artists, and patrons of architecture: how each contributed to the development of architectural forms; outstanding names associated with this art
Architecture as an index to national developments (showing how different nations have expressed themselves through architecture)
Buildings are monuments to progressive civilizations: reveal the trends of life and culture of each period; reflect national and social aspirations and needs; reveal inventive and creative genius of nations at certain periods; reflect the character of a people; disclose forces and agencies of civilization; supply human interest to art; interpret the study of man's supremacy

English: Composition and Literature

Writing reports
Keeping a record book of the study of architecture
Study of the literature of the peoples who developed the different periods of architecture (both prose and poetry)
Biography of some of the outstanding persons who contributed to the development of the different periods
Writing reviews of the different books used
Making a bibliography
Use of encyclopedia, dictionary, etc.
Dramatization of a story for an assembly program
Reading of poems of different civilizations, especially ancient ones—stressing the point that poetry, like architecture, is an expression of the times
Letter writing: social and business
Giving class reports (oral)
Preparing speeches for an assembly program
Vocabulary-building
Preparing outlines for individual reports, class discussions, excursions, and assembly programs
Condensing source materials for reports

Reading

The reading necessary to answer satisfactorily the questions asked in connection with the study of architecture

The verification on findings

The development of efficient reading habits in order to get the best answers

Efficient use of the reference library

Note-taking from reading sources

Individual reading prompted by interest in architecture (The class bibliography is listed on pages 343 to 346)

"Keeping abreast of the times" through reading daily newspapers and current publications

Science

Architectural construction principles such as the post and lintel, the keystone, balancing weight, necessity of solid foundation, etc. The principle of the thrust and counter-thrust, the span, the buttress, the arch, etc.

The law of gravity

Principle of suspension

A brief survey of the geology of different lands to find sources of construction materials

How climatic conditions influence man's architecture

Problems of sanitation and ventilation

How modern architecture is trying to provide for health-producing conditions

Music

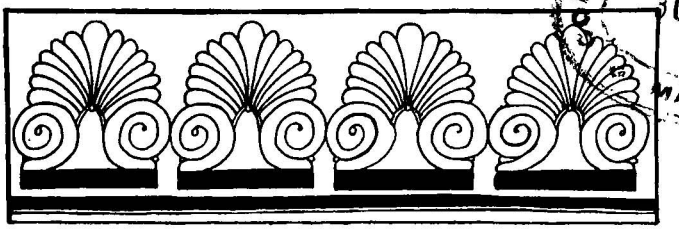
Becoming familiar with the works of master composers who have tried to interpret national life and traditions through music

Interpreting the meanings of musical compositions through rhythmic dancing and bodily movements, through dramatization, through pictorial composition, or through stories

Physical Education

Sports, games, and physical activities of other times

Interpretation of historical events through rhythmic dancing and pantomime



Chapter XIII

ACTIVITIES NOT A PART OF THE UNIT OF WORK

No units of work selected by our elementary schools are or can be all-inclusive; very few have such an extensive scope that they serve all the needs and purposes of the growing child. The most skillful teachers find that many additional activities naturally accompany even the richest and broadest of classroom experiences. However, these conditions and limitations do not disqualify the principles of the activity program, nor do they throw into the discard the educative medium of units of work. A nucleus of interest or a central theme can dominate most of the classroom procedure while, at the same time, other educative activities and endeavors are carried on quite independently of the major interest. Such conditions exist in life; both children and adults find themselves forced to make constant adjustments to a variety of interests and forces. These changing adjustments do not tend to destroy the fascination of a major activity; in fact, they seem to enhance it. Just such conditions

must exist for the child in his everyday environment and in his school relationships. Since school environment should present real life situations, so should these changing and varied activities be included in the classroom program.

In this particular sixth grade the impetus was furnished for one of the most stimulating of these parallel activities by National Book Week. The entire elementary group of Lincoln School plan each year to have some special program for this occasion. The school Librarian works with the children, introducing to them the titles of current publications or reviewing with them some favorite books in the school library. Sometimes a play adapted from some story or book is presented at a general assembly by one of the elementary groups. Often an author is invited to take part in the Book Week Assembly program. For two successive years the sixth grade classes pursuing the unit on architecture assumed the responsibility of planning the major part of the program.

The first group, in coöperation with the Librarian, compiled a list of favorite and representative books from the general library. In addition, the members of the class wrote book reviews, the best of which were distributed among the upper grades of the elementary school. A copy of the reviews was also kept on file in the library. The class hoped, by means of this record, to help the elementary school to choose interesting and worthwhile books for their pleasure reading.

These reviews required concentrated work in written English and also wide experience in the field of child

literature and reading in order to make a representative and varied list of books to present to other children. Each child first reviewed orally before his classmates the plots and incidents of some story which he wished to add to the list. The class criticized the review and passed judgment upon the selection of these stories. They made suggestions to the reviewer whereby he could add a note of interest to his review or alter his report so that it would be more appealing. After receiving these suggestions the reviewers prepared their written copies. Some of the first drafts were very poor. Deficiencies and weaknesses were revealed when these first attempts were read to the class. New suggestions were given to the reviewer, and a second report was prepared. Generally speaking, the second review was much better and was usually accepted by the class. In a few cases the children had to write their reviews three times before an acceptable report was presented.

While the children were preparing these reports the teacher read to them a number of reviews which had appeared in the book sections of newspapers and magazines. These models helped the children to write more comprehensive and suggestive reports as well as to form a higher standard of workmanship.

All the children in the group participated in this activity. Two of the reviews written by one of the girls are here quoted. The first one represents her initial effort; the second, her revised copy after receiving class criticisms and suggestions. There is no need to call attention to the great improvement in the second report prepared by this child. This improvement was brought

about through encouragement from the other children and through the general rise in standards of work developed by the class.

BOOK REVIEW

(*First draft*)

Salten, Felix—*Bambi*—Simon & Schuster

"Bambi" is the biography of a deer. One of the very interesting events was when Bambi was all alone at home and his mother was a little later than she was usually and Bambi wanted her so, he began to cry. Then he looked up and saw something looking over the bushes. What was it? Read and find out.

(*Review written after criticism and suggestions were given.*)

Salten, Felix—*Bambi*—Simon & Schuster

"Bambi" is the life of a deer from the time that he was a baby until he grew up and became the stag of the forest. The many interesting adventures that befell him between these times are worth reading about. I liked this book because the story was so delightfully and understandingly told.

The children did not terminate their interest in book reviews with these written reports, but carried it forward to critical evaluations of reviews found in current periodicals. A review of *Smoky,* a favorite book, was written by one of the boys. Later this boy found an adult review of the same book. This did not seem to him to be a typical review, so he wrote a critical report of it. Both reports follow:

BOOK REVIEW

James, Will.—*Smoky the Cowhorse.*—Scribner Co., Charles

Smoky is the story of a range cowhorse in Arizona. From the time of his birth to his death he has many experiences

with his kin. When he was only half an hour old, he was up and around. He led a wild, beautiful life until he was four years old when he was caught and branded. Then he was turned into a cowhorse by a rider to whom he became very devoted; and through this rider's kindness and understanding of horses, Smoky developed into one of the finest and most famous cowhorses in the West.

This book tells so delightfully the story of Smoky's first four years of life and his later experiences as a cowhorse that one feels the beauty of the human side of his life.

REVIEW OF A REVIEW

James, Will.—*Smoky the Cowhorse.*—Scribner Co., Charles
Reviewed by Mr. ————————

The book is reviewed very well except that Mr. ———— told the whole story in his review. After reading the reviewer's report I doubt that the book itself would be so interesting. Otherwise the story is told as James wrote it. The style of the review is calm and the story is beautifully told. After one reads the story he feels more keenly the beauty and the dignity of Smoky's life. These the reviewer has failed to emphasize.

As National Book Week drew near the class had to choose from all the written reports those reviews which were worthy of a place in the class booklet. They also strove to select a list of books that would include most of the types of stories enjoyed by children of the ages of the upper elementary school. By elimination they chose the following books to be reviewed in the class booklet:

Bartlett, C. A.	*The Sea Dog*	Wilde
Baynes, E. H.	*Polaris*	The Macmillan Co.
Campbell, H.	*The Little Great Lady*	Harper & Bros.

Charnley, M.	*The Boys' Life of the Wright Brothers*	Harper & Bros.
Carter, R.	*Three Points of Honor*	Little, Brown & Co.
Dickens	*Great Expectations*	Chapman
Doyle, A. C.	*The White Company*	Cosmopolitan
Finger, C. J.	*Courageous Companions*	Longmans, Green & Co.
Follet, B. N.	*The Voyage of the Norman D.*	Alfred A. Knopf
Green, F.	*Dick Byrd, Air Pilot*	G. P. Putnam's Sons
Kipling, Rudyard	*Jungle Book*	The Century Co.
Lamb, C. & M.	*Tales from Shakespeare*	The Macmillan Co.
Lesterman, J.	*A Sailor of Napoleon*	Harcourt, Brace & Co.
Masefield, John	*The Midnight Folk*	The Macmillan Co.
Meigs, C.	*Clearing Weather*	Little, Brown & Co.
Moon, Carl & Grace	*Lost Indian Magic*	Frederick A. Stokes Co.
Mukerji, D. G.	*Ghond, the Hunter*	E. P. Dutton & Co.
Mukerji, D. G.	*Gay-Neck*	E. P. Dutton & Co.
Pyle, H.	*King Arthur and His Knights*	Charles Scribner's Sons
Quiller-Couch, Sir A. T.	*Splendid Spur*	Doubleday, Doran & Co., Inc.
Salten, Felix	*Bambi*	Simon & Schuster
Seymour, F. M.	*Boy's Life of Kit Carson*	The Century Co.
Skinner, C.	*Becky Landers*	The Macmillan Co.
Skinner, C.	*Andy Breaks Trail*	The Macmillan Co.
Thomas, Lowell	*Count Luckner, the Sea Devil*	Doubleday, Doran & Co., Inc.
Twain, M.	*Huckleberry Finn*	Harper & Bros.
Verne, Jules	*Twenty Thousand Leagues Under the Sea*	Rand, McNally & Co.
Verne, Jules	*The Castaways of the Flag*	G. Howard Watt

Reviews of these books were then mimeographed for the booklet. An attractive wood block of Pegasus mounting through the clouds was chosen for the cover design. This design was selected from many sketches made by members of the class during their work in Fine Arts. The following composite introductory paragraph was written to preface the booklet.

> These reviews were written by the Sixth Grade as its contribution to Book Week. Each member of the class contributed to the booklet.
>
> The cover design by Stephen was chosen by the class as the most appropriate.

The activity took place in the early months of the school term, but the interest in book reviews held throughout the year. As each child found a book which he thought might appeal to the class, he wrote a brief review of it and kept it in a book file for class reference.

The following year the next class, acting in coöperation with the Elementary School Council, also assumed responsibility for preparing the program for Book Week. This contribution was rather unique for the class assumed the rôle of benefactor in this case.

In an earlier chapter reference was made to a fire in a school in the Middle West which destroyed the school library. The report of this loss was presented to the children of Lincoln School at a meeting of the Elementary School Council and the representatives were asked to evolve some plan whereby they might help these children to rebuild their library. The sixth grade representatives, as senior members of the Council, took up the matter with the Librarian of Lincoln School and discussed several

possible plans. Together they decided to initiate a "drive" for books. The sixth grade room became the headquarters for this activity. The class worked out a plan whereby each child in the elementary school was to contribute from his own library copies of those books which he had outgrown or of which he had duplicates. Representatives from the sixth grade class visited each room of the elementary school and explained in detail the aims and expected outcomes of the "drive." They earnestly sought the coöperation of each child by pointing out the values of united effort in carrying forward such a helpful enterprise. Members of the class printed large signs which were hung in the classrooms to remind the pupils of their promise to coöperate in this activity. Large placards and book displays were also placed in conspicuous places in the corridors.

Books were brought to the sixth grade classroom and here the children of this group classified them according to the age level for which they believed the books to be appropriate. Members of the class visited various rooms to report the progress of the "drive" and to appeal for types of books not already contributed.

On the day of the regular weekly assembly these books were taken to the auditorium and arranged on the stage so that all the children might see the results of their work. The number of books brought in was amazing and exceeded even the most optimistic expectations of the committee. When the display was arranged in the auditorium the books formed a row extending across the entire width of the stage. In addition several of the larger volumes were displayed on a table directly in front

of the stage. A member of the sixth grade made the report summarizing this activity and the plans for sending the books to the Middlewestern school. As an added attraction, the school Librarian had been asked by the class to preside at this meeting and to tell the assembly something about the newest books for children. She not only presided but she brought several of the most recent publications to show the children and read extracts and humorous selections from them. Besides the enjoyment derived from the actual program, the children had the added satisfaction of knowing that their efforts had resulted in a practical benefit to the children of another school.

As Christmas approached the children expressed a desire to share in a fund that would be given to some worthy charity. The one chosen was the Manhattanville Day Nursery, an institution depending upon voluntary contributions. As their part of this philanthropic work the children chose to bring donations of food and staple supplies rather than money. The food was packed in hampers by the children and delivered to the nursery at the close of school just before the Christmas holidays.

Interests rising from the Thanksgiving and Christmas season were responsible for the initiation of numerous group and individual activities. *The Feast of the Tabernacles,* based on a Hebrew ritual, was chosen as the theme for the Thanksgiving assembly. Each class in the school had a share in preparing this pageant, and while but few sixth grade children were actively engaged in it, the in-

terest of the entire class was centered upon the success of the program. A Hebrew cantor was invited to sing some of the chants actually used for this ceremonial in one of the city synagogues.

At Christmas time two assembly programs were planned—one of a more mature nature and the other quite childlike. The Librarian had charge of the first program; therefore, the children had no responsibility in planning for this. For the second program child activity was provided through the informal medium of games and dancing. The gymnasium was used for this program. A large Christmas tree was decorated and placed in the middle of the room. This was the center of activity for the program. Each class and also mixed groups of girls or boys from several classes had a definite part in the program, for this activity included all the grades of the elementary school. Singing games, folk dancing, rhythms, and interpretive dancing were presented before the guests and the assemblage of children. The spirit of enjoyment and genuine childish pleasure permeated the entire program.

The Industrial Arts and Fine Arts departments made special plans for a number of individual activities to be carried on at Christmas time. The children made gifts from clay, from metal, from leather, and from wood. Some of the children carried over their ideas of architecture for their wood blocks as shown on page 214 of this book. One boy used for his Christmas card the rose window design. The print of his card is reproduced on page 317.

The Household Arts teacher provided materials and special help for those children who wished to make cookies, candies or jellies to use for Christmas remembrances.

In the spring the school held a bazaar at which the children sold some of their products. The proceeds from this sale were applied to two funds—the general school treasury and the fund for charity. Some of the products sold were block prints, book plates, clay models, pewter

THE ROSE WINDOW DESIGN CUT IN A WOOD BLOCK BY ONE OF THE CHILDREN FOR USE AS A CHRISTMAS CARD.

and other metal articles, candies, jellies, marmalades, and cookies. The sixth grade pupils, however, decided to organize a book mart rather than to sell their own wares. The books could be ordered through a nearby bookseller who would give the class a twenty per cent discount on each book ordered. The class had to figure out how they could resell these books at a price that would yield them a fair profit. They had to understand the principles of

buying and selling, of profit-making and of profit-taking. They had to become familiar with the term and the meaning of the word *discount*. Many practical questions arose. The following illustrate some of them:

What is profit?
What is meant by cut-rate?
How do dealers arrange for this?
What is capital?
What is deficit?
What is commission?
What is discount?
Which would be more profitable (in planning for this sale): to deduct the discount from the price of each separate book or deduct it from the total bill?

The class had to formulate some feasible working plan for ordering books and for recording these orders. They decided upon the form shown on page 319. It was mimeographed and distributed to each class. The children filled in the orders and sent them back to the sixth grade.

A committee of three children was appointed to take charge of the sale of books. When this group met, they selected a chairman who directed the work of the committee. The group decided at their first meeting to carry out the following plan:

1. To make a list of all the names of the children in the elementary school who ordered books.
2. To file and check orders as they were received.
3. To make duplicate cards for each order.
4. To prepare these orders for the distributing store by listing the books under the names of the publishers from whom the books must be bought.
5. To make signs reminding children of the sale. (These signs are to be hung in halls, classrooms, and on notice boards.)

FOR THE BAZAAR

March 26

TO OUR CUSTOMERS:

The Elementary School is giving a Bazaar. The Sixth Grade, Room 207, has gone into the book business. We cannot give you books at cut-rate prices but we can at least sell books at regular prices. Help make our business profitable by ordering below. Call at book stand on the day of the Bazaar for books ordered.

Orders must be in by March 20

SIXTH GRADE, Room 207

Author:_____

Title:_____

Publisher:_____

Signature:_____

The chairman brought to school the following morning an alphabetized card index file. Then he met with his committee in one corner of the room which had previously been set apart from the general classroom space and was equipped with two low tables and three chairs for their use. A discussion about the handling of the orders was the initial class activity of the morning. The committee reported their working plans to the class. Several omissions were noted in these plans which the teacher thought

should be corrected. Accordingly a new way of procedure was devised during this period.

It read as follows:

RECORD OF BUSINESS: COMMITTEE'S PLAN

Class Record

Send out order blanks; distribute among classes.

Committee will keep original order blanks because of record of orders (orders as signed contracts).

Book orders will be filed according to person's name (alphabetized).

Make a class list (for each class) in order to locate individual orders easily.

Keep price of book on each order.

Keep a separate price-list of books for total.

After books are received make out blanks or slips with names of person ordering and insert them in books. (Alphabetize to facilitate handling.)

Distributor's Order

Make a list of books according to publishers.

Verify list by referring to *United States Catalogue, Reader's Guide,* or other authentic sources.

For about a week preceding the bazaar these book orders were received and filed by the committee according to the plan. The lists were then classified by publishing companies and sent to the dealer. A separate order sheet was prepared for each publishing company represented; on it were listed the title, author, and price of each book. When the orders were delivered to the classroom the children checked the books with their lists to verify the transaction. Name slips and the price of each book were inserted between the fly leaves to identify the purchaser. On the day of the sale a "book table" was set up in the

corridor outside the sixth grade classroom. Four clerks were assigned to this table—three to distribute the books and one to serve as cashier. Beforehand, the class had borrowed $2.50 in change from the school fund and had arranged this money in the change box according to denominations. A record of this loan was made in the teacher's files and was later destroyed when the debt was paid after the sale. The cashier made change and kept an account of the sales. He was also called upon to consider the advisability of accepting checks in payment of the books purchased. He decided that only those checks made payable to Lincoln School and made out for the exact amount of money due would be accepted. As each purchaser called for his book, the clerks verified his order and his name. As he paid for the book, the name card inserted therein was marked "Paid." Those purchasers who did not have money enough with them to cover their bills were asked to sign the reverse side of the name card on which was recorded "I. O. U. ——— (amount)." These cards and the uncalled-for books were returned to the classroom after the sale and kept until a complete settlement was made. As each child later paid off his indebtedness the cards were receipted and given to the purchaser.

The day following the sale was devoted to auditing the class accounts and to figuring and deducting the profit from the amount of money realized from the sale of books. The dealer's statement was written on one blackboard, the class's statement on another. The children verified both accounts and deducted the amount of money owed from the amount of money taken in. The money owed

was put in one box and the profits put in another. The current expenses and the loan of $2.50 were deducted from the profits. Then a written report of the book mart was prepared for the Elementary School Council. The amount due the book dealer was sent to the elementary business office which, in exchange for the money, issued the class a school check for the specified amount. The balance of the money representing class profit was sent to the elementary school fund together with the summarized statement of the sixth grade's share of the bazaar activities.

The school, as a whole, participated in a number of activities which utilized the interests of all the children in the elementary group. In all of these activities, the sixth grade played its part in assuming the responsibility for carrying forward suggestions for the good of the school. The group was especially active in the Elementary School Council, the coöperative governing agency of that division of the school. Individual members assumed the chairmanship of different committees, directed "reforms" in pupil management, and performed other tasks in line with their offices. The following report from a meeting of the school council indicates the kinds of activities undertaken by this group of children. This report was a composite effort and represents the work of the representatives of the elementary school.

SOME SUGGESTIONS FOR IMPROVING THE SCHOOL

The various grades made some suggestions to help make the school better. The council members brought them to

Council and they were read. This is the list that was sent to the office to be mimeographed:

AFTER SCHOOL

1. People should not go into other classrooms.
2. Do not wait and play outside the building.
3. If you have a short waiting time stay in your rooms. If the time is long read in the library.
4. Leave promptly after club is over.

SUGGESTIONS FOR USING DRINKING FOUNTAIN

1. Do not push people's heads when they are drinking.
2. Do not put hand over fountain and make it squirt.
3. Do not push when waiting to drink.
4. Keep your place in line.

SUGGESTIONS FOR ELEVATOR

1. Be more courteous to Mr. Blacoe, who operates the elevator.
2. The fifth and sixth grades should not use the elevator except for gym.
3. Do not ask Mr. Blacoe if you can run the elevator.
4. Do not push in the elevator.
5. Do not go in elevator by twos.
6. Do not try to enter elevator before those who are in it come out.

SUGGESTIONS FOR THE HALL

1. Be more courteous.
2. Talk in quiet tones.
3. Leave your classroom more quietly.
4. Do not play with toys in the hall.
5. Do not run in halls.
6. Do not slide down banisters.

7. Do not slide in hall.
8. If you spill paint or water wipe it up.

SUGGESTIONS FOR LUNCHROOM

1. If you go to the lunchroom late go to the end of the line.
2. Go to lunch with your class.
3. Do not push in line.
4. Do not bother flowers on tables.
5. Try to select the best lunches so Miss Battles won't send you back.
6. Talk quietly in lunchroom.

SUGGESTIONS FOR WASH ROOM

1. Do not waste soap.
2. Put used towels in basket.
3. Do not slam doors of wash room.

(*Signed*) ELEMENTARY SCHOOL COUNCIL.

The class also coöperated in the "drive" for the Junior Red Cross. They raised the quota of money set for the grade and enrolled almost every child in the group as a member of this organization.

Aside from these activities there were developed also many activities of a more abstract nature. Individual children whose records of accomplishment in specified tool subjects were below the class norms, tried to improve their work so that they might raise their standings.

Most of the curriculum requirements for the sixth grade were found in the unit of work; however, not all of them functioned to the utmost for many of the children. In such cases special provision was made for additional practice and instruction. Those children whose class

ratings were not up to the class norms for the tool subjects were given periods of special tutorial help for raising their ratings. These periods were supervised by trained teachers acting as assistants to the classroom teacher. The classroom teacher had previously selected from the class group those children with definite deficiencies or insufficient practice in these subjects. Likewise, she had conferred with the assistant about the requirements needed by each child and, in many cases, she suggested the kind of remedial help to be given. The children needing this help and drill met in groups with the assistant at designated times. Special help was given in penmanship, spelling, arithmetic, and written English. Progressive tests were given at frequent intervals to check the rate of progress for each child. Occasionally, exercises based on class work were also given to determine a child's ability to carry on his work without extra help. As soon as a child had shown evidences of being able to maintain class standards, he was released from these drill periods. In some cases, however, the tutorial help was continued throughout the year. This was true especially of spelling, in which branch many of the children required definite instruction over an extended period of time. In arithmetic, penmanship, and written English the deficiencies were due largely to a lack of drill in the mechanical processes. As soon as this was provided and the processes or responses became automatic there was no further need for special help.

The children of sixth grade seldom require definite instruction in reading for, by the time that they have reached this grade, they have mastered the mechanics

involved in the reading process. However, children frequently fall into bad or slovenly habits of reading, or they read superficially thus not completely comprehending the meaning of the printed page. The classroom teacher must be alert in detecting these superficialities and in devising means of overcoming them without destroying the interest in reading. No child likes to be tested (nor should he be) on everything that he reads. However, with children definite measures should be established to advance their ability to comprehend, and to extend their reading interests. In this unit of work there were innumerable occasions to judge the quality of reading being done by the class. So much of the material for reports, for notebooks, and for discussions was derived only from printed materials that the teacher was able to evaluate the degree of reading comprehension of each child in the class. It so happened that very few of the children had acquired bad habits, so there was practically nothing to correct in this process. However, the teacher was anxious to broaden their reading interests, so she consciously provided means to keep a record of the kinds of books being read for pleasure or recreational reading. The record was based on the pupils' own lists referred to in an earlier chapter. The scores from standard reading tests showed her the range of ability in the class; the class work showed her the application of that ability.

As each child finished reading a book he recorded the title and author of the story on a list reserved for his individual use. At stated intervals the teacher studied these lists to find the kinds and the scope of literature in which the child was interested. If his list was made up

of books beyond or below his ability, he was called into conference with the teacher. She was anxious to have this device function naturally; she knew that many children might compile a long list of readings in order to impress her or to compete with the records of other children. To accomplish this, he might fill his list with titles of brief or too juvenile books easily read in a short time and, therefore, might present a rather formidably extensive list of readings. In order not to build up a competitive attitude in reading, these lists were discussed only in conferences between the teacher and the child. At these times, she questioned the child about his choice of pleasure readings or suggested titles of books that might appeal to him. She frequently suggested that the child ask advice of the Librarian if he was undecided about the book that he wanted to read. In the meantime, she took the child's list to the Librarian and sought her help in ways of improving his reading interest.

The children had access to the school library at all times. It is very modern and extensive, and completely equipped and maintained to cater to children's interests. All the most recent reputable publications, as well as the older favorites, are to be found on the shelves, so there are no reasons why a child should not develop his reading tastes to the utmost. The school Librarian is a source of inspiration and help. She visits each classroom and knows the interest of the children; she tries to provide books that will enrich and further these interests; she reviews and presents the newer books in the classroom, the library, or at the general assembly periods of the elementary school. In fact, she does everything in her

power to inspire and to develop a permanent interest in books. Fortunately, the children take advantage of these library opportunities and facilities; they show real appreciation for the Librarian's suggestions and advice, and they read extensively both at school and at home. Reading is one of the dominant activities of the school.

It is no wonder, then, that the majority of the children have developed reading tastes far beyond the average for their age. There is no conscious effort to foster mature tastes in reading; in fact, the effort is exerted more to direct this interest along the lines of child literature developed for the particular age level of the child. No child is coerced into reading books below his level of interest, but the children are encouraged to become better acquainted with the child literature contributing to their interests and experiences.

The reading lists for this particular sixth grade show the effects of this training. The selection of books ranges from very childlike choices to those of mature readers. It would be impossible to include in this account the complete lists for each child, but selections from a representative list are reproduced in the following section. A random selection of a few books chosen from other lists is also added.

SELECTIONS FROM A REPRESENTATIVE READING LIST

Author	*Title*	*Publisher*
Ada Skinner—Eleanor Skinner	*The Topaz Story Book*	Duffield
Edmund Leamy	*The Fairy Minstrel of Glenmature*	Desmond Fitzgerald Jr.
William E. Griffis	*Dutch Fairy Tales*	Thomas Y. Crowell Company

Author	*Title*	*Publisher*
Oliver Goldsmith	*The Vicar of Wakefield*	Dutton Company
Joos	*The Golden Prince*	Duffield
Susan Coolidge	*Clover*	Little, Brown & Co.
Will James	*The Drifting Cowboy*	Little, Brown
K. O. S.	*Just Horses*	Macmillan
Pogany	*Magyar Fairy Tales*	
Susan Coolidge	*In the High Valley*	Little, Brown
Hector Malot	*Nobody's Boy*	
George Macdonald	*The Princess and Curdie*	Little, Brown
Lustig	*Roses of the Winds*	Doubleday Page
Haskell	*Katrinka*	Dutton
Louisa Alcott	*Eight Cousins*	Little, Brown
Louisa Alcott	*Rose in Bloom*	Little, Brown
Louisa Alcott	*An Old-fashioned Girl*	Little, Brown
Louisa Alcott	*Aunt Jo's Scrap Bag* (Vol. I)	Little, Brown
Jewett	*Egyptian Tales of Magic*	Little, Brown
Anne Green	*Greylight*	Century
Anne Green	*The White Pony in the Hills*	Century
Stein	*Little Count of Normandy*	Page Co.
Susan Coolidge	*The New Year's Bargain*	Little, Brown
Allen French	*The Story of Grettir the Strong*	Dutton
Macdonald	*The Light Princess*	Little, Brown
Jean Ingelow	*Mopsa the Fairy*	Little, Brown

OTHER CHOICES OF BOOKS FOUND IN CHILDREN'S LISTS

Stevens, William O.	*The Boy's Book of Warships*	Macbride
Hale, E. E.	*Tales from the Travels of Baron Munchausen*	D. C. Heath

Author	*Title*	*Publisher*
Meigs, C.	*Clearing Weather*	Little, Brown & Co.
James, Will	*Cow County*	Scribner
Byrd, Richard	*Little America*	
Carpenter, Frances	*Tales of a Basque Grandmother*	Jr. Literary Guild
Carrington, E. S.	*The Gypsy Star*	Harper
Baldwin, James	*The Story of Roland*	Scribner
Masefield, James	*Jim Davis*	Grosset & Dunlap
Wiggin, Kate D.	*The Bird's Christmas Carol*	Houghton, Mifflin
de la Roche, Mazo	*Portrait of a Dog*	Little, Brown
Alcott, Louisa	*Little Women*	" "
" "	*Little Men*	" "
" "	*An Old-fashioned Girl*	" "
" "	*Aunt Jo's Scrap Bag*	" "
" "	*Eight Cousins*	" "
Jewett	*Egyptian Tales of Magic*	" "
Mukerji, D.	*Gay Neck*	Dutton & Co.
Dix, B. M.	*Merry Lips*	Macmillan Co.
Mukerji, D.	*Ghond, the Hunter*	Putnam
" "	*Kari the Elephant*	"
Colum, P.	*The Children of Odin*	Macmillan
Baynes	*Polaris*	"
Collins, A.	*The Book of Electricity*	Appleton
Bostock	*Training Wild Animals*	Century
Lansing, M. F.	*Page, Esquire & Knight*	Ginn
Lamb	*Tales from Shakespeare*	
Byrd, Richard	*Skyward*	
Hale, L.	*The Peterkin Papers*	Houghton Mifflin
Hornaday, W. T.	*Wild Animal Interviews*	Scribner
Wallace, D.	*Bobby of Labrador*	Revell
Tarkington, Booth	*Penrod*	Grosset & Dunlap
" "	*Penrod and Sam*	" " "

Author	*Title*	*Publisher*
Twain, Mark	*Adventures of Huckleberry Finn*	Scribner
" "	*Tom Sawyer*	"
Kipling	*Jungle Book*	Century
"	*Second Jungle Book*	"

A part of one afternoon is set aside each week at Lincoln School for an interval known as the Creative Work Period. This period provides opportunities for instruction and practice in those activities that are not adequately cared for in the routine of the school program. It is open to all the children in grades four, five and six. The younger children are excluded only because their daily schedule closes at one o'clock. Similar opportunities, however, are provided in their own classrooms.

The list of available activities is given to the children early in the school year. The only formal requirement for becoming a member of any group is that the child remain with that group until he has completed that piece of work which he has chosen to do. Usually this time is of short duration for the self-chosen project is soon completed. If he desires to continue with this group, he may remain a member as long as he wishes. However, the children usually change groups each month. If several children request an activity not included in the list, provisions are made to meet this request.

All the teachers volunteer to supervise or to help groups of children who wish to carry on definite activities. These activities were chosen originally from lists of suggestions submitted by the children. Among those requested were cooking, sewing, dramatics, swimming, painting, music, work with clay, metal, and leather,

science, organized competitive games, and French. Each teacher helps the group carrying on the work in that subject in which she is most interested, best equipped, or most proficient. Thus each child has access to a great number of groups in which both instruction and direction are being given by trained adults. This period was not devised, however, as a teaching period but rather as one during which children might find expression and practice through a variety of media. It might happen that a certain child whose major interest was costuming or sewing would find no opportunity in the class unit of work for this particular activity. The school maintains a department that gives help in advancing this particular interest; were this not so the children might be deprived of the opportunity to satisfy their needs and desires. For such children, this Creative Work Period was designed. It was so called because it was organized for the purpose of liberating the child from group enterprise so that he might *create* a tangible product in line with his individual interests.

Frequently it so happened that many of the children carried over to this period a part of their interest in the unit of work being developed in their classrooms, but this was done only by the choice of the child. For instance, in one group made up of children from the fourth, fifth, and sixth grades, the chosen activity was designing and making linoleum block prints for book plates, greeting cards, or cover pages. Many of the sixth grade children used an architectural detail or feature as the design for their blocks. The choice of design or medium of expression was optional with each child. The teacher of Fine

Arts was present in the room to make suggestions, to criticize (when asked) any piece of work, or to help the child to express his own ideas.

Another group of sixth grade children working in the Industrial Arts shop combined their efforts in making a frame on which the class might hang and preserve their stencils for the class assembly. One group experimented with a device that would reflect the light needed for their shadow pictures. While these activities were suggested by classroom interests, they were in no way prescribed either by the class or by the teacher.

Several of the children who were not so proficient in swimming chose to use these periods as opportunities for instruction and practice. The swimming instructor and many children were present at the pool during these times, so that beginning swimmers were always safeguarded and protected while they practiced.

The unit of work for the sixth grade provided no opportunities for cooking, so a large group of these children enrolled for this activity. The teacher in charge so arranged these periods that the children had experiences in many simple forms of cooking. They made candies, jellies, cookies, cakes, ice-cream, muffins, cocoa and shortcake. They learned how to prepare and cook vegetables, how to make plain salads, and soups. At the close of the year the teacher prepared mimeographed copies of all the recipes used during the year. These were distributed among the children so that each child had his own set of recipes for simple cooking.

The dramatization group met to dramatize stories and plays primarily for their own enjoyment. However, during the year this group prepared two plays to present to the elementary school at the general assembly period. The children voted upon the story for dramatization. It was then worked out, costumed, and prepared for presentation during these weekly periods. The teacher in charge acted as senior director to the group, giving help and criticism when it was needed.

Through these Creative Work Periods, then, the children found an additional outlet for self-expression. But there were many values derived from these periods and perhaps the greatest were the social values—the opportunities provided for genuine social intercourse. Here children met with others of different interests, abilities, and experiences. The "give and take" in such a mixed group provided splendid opportunities for training; the need for coöperation and tolerance was paramount, and the social values derived were great influences in character development. The fact that older and younger children met and worked together to complete a definite piece of work was valuable for each child. These periods also provided opportunities for the emergence of latent talents and abilities which might never have been revealed through a group enterprise.

An account of the parallel interests of this sixth grade would be unduly long if it included all the experiences to which the children were exposed and in which they had practice. This brief survey of these activities is only indicative of the stimulating atmosphere in which the

children lived and worked. The teacher was conscious of the problems included in carrying forward such a comprehensive study and she was earnestly desirous of bringing about the fullest development of each member of the group. The first hand experiences outlined were, in her estimation, of greater importance and value in child development than drill and rote learnings. Except in those instances in which these mechanical responses were lacking or inactive, she was confident that a maximum use of activities and experiences would be more effective in furthering the progress of the group than a more formal and static program of procedures.

A consideration of the daily program in connection with this unit of work may not be amiss at this point. (The schedule is shown on page 336.)

One of the controlling factors in the success of an activity program in the elementary program is the length of the daily period. In the upper grades especially this schedule should be flexible and permit long, uninterrupted periods for work. It should make provision also for many recurrent blocks of time during each of the school days. Children need these periods to carry on the activities initiated in connection with a unit of work. Frequent, shorter, snatchy intervals are not substitutes for the longer periods, for they allow insufficient time to carry on the work at hand. The use of such periods helps to build up bad habits of work, dissatisfaction with the work undertaken, and distraction during the following periods. Not all the work undertaken can be completed in the longer interval, but at least the time allotment is such

DAILY PROGRAM

Time 9:00	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Time* 9:00
9:30	Arithmetic	Arithmetic	Arithmetic	Assembly	Arithmetic	9:30
10:00	Spelling				Spelling	10:00
10:30	French	French	French	French	French	10:30
11:00	Gymnasium	Gymnasium	Gymnasium and Swimming	Gymnasium	Gymnasium	11:00
11:30	Unit of Work	Creative Music *	Unit of Work	Unit of Work	Music	11:30
12:00					Unit of Work	12:00
12:20		Unit of Work				12:20
1:30	Lunch and Recreation					1:30
2:00	Household Arts	Fine Arts	Creative Work Period **	Individual Needs	Industrial Arts	2:00
2:30				Creative Music *		2:30
3:00				Individual Needs		3:00
Lunch and Dismissal						

* The work of the creative music period is described in *Creative Music* and in *A Children's Symphony* both by Satis Coleman. Bureau of Publications, Teachers College, Columbia University, 1931.

** This period is described earlier in the chapter.

that a great deal can be accomplished towards its completion.

Regular periods for special teachers are essential, though not obligatory. However, since one of these special teachers usually works with many different grades, she must have a definite schedule for the distribution of her time. In Lincoln School the practice is to allot long periods to these teachers with the understanding that, if they are not needed by the children, the special teachers may extend their periods with other groups. The classroom teacher usually knows in advance whether or not the children are ready for these special periods. Thus she can notify the other teachers, who can rearrange their programs to fit the needs of the school. Likewise the classroom teacher feels free to request additional or extended periods from the special teacher if the class needs extra time for carrying on their work. The special teachers confer with the classroom teacher about the unit of work and seek opportunities to provide for activities and instructions which will relate to the classroom theme. Thus all teachers coming into contact with the children bring additional views and interpretations of the unit of work.

The program reproduced on page 336 was followed in a general way by both sixth grade groups. It is not presented as a model to be used generally in similar situations. It is included here merely to show in outline form the distribution of time in the school day of these particular children.

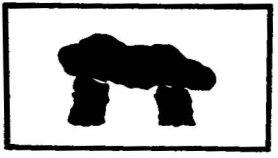
On the answer to such questions depends much of the success of the unit.

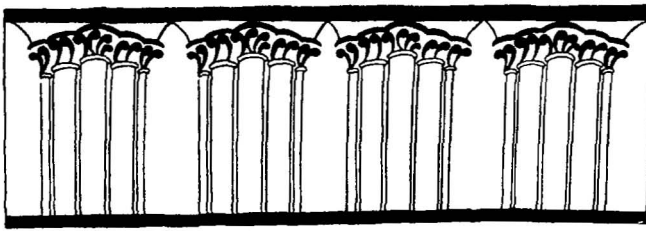
The teacher who is considering launching such units of work should ask herself before she prepares her program such questions as:

Does this schedule give periods sufficiently long for worthwhile study and discussion?

Are there periods for special teachers to work both with the class and with individual groups?

Is the program flexible? Does it permit change and adaptability to fit needs and emergencies?





Chapter XIV

BIBLIOGRAPHY

BOTH the teacher and the children had access to and used a great number of books during the course of this unit of work. Some of these books were of value only to the individuals interested in some particular phase of the study; others were used generally by the majority of the class either for general background or for research upon a specific topic.

Each child owned two textbooks on architecture which were used, however, only as references; that is, these texts were not studied or read as class exercise, but they served each child as he had need for them. The two textbooks were:

Barstow, C. L., *Famous Buildings*. New York. The Century Company. 1915.

Wynne, Gladys, *Architecture*. New York. Nelson and Sons. 1915.

The following bibliography includes the titles of the books used generally during this unit of work. For con-

venience, it has been divided into three parts. One list contains the names of books used by the teacher herself as preparation and source material for the study of architecture; another list includes those books used by the children in carrying on this particular study; and a third list catalogues the books used for supplying historical background for the unit. Those books used as references by the majority of the children are starred to differentiate them from those borrowed from the library or brought to the class by individual children from their own homes.

Reference Books Used by the Teacher

Brooks, Alfred M. *Architecture and the Allied Arts.* The Bobbs-Merrill Company, Indianapolis, Ind. 1926.

This book gives attention to the environment and foundation history of the principal periods of architecture. It tells also of the principles of architecture. Illustrated by photographs, diagrams, and sketches.

Chandler, A. C. *Magic Pictures of Long Ago.* Henry Holt and Company, New York. 1918.

The history of architecture in story form. It tells such stories as the origin of Rome and the rights of the government of Athens. The material is very good for reading and lends itself to dramatization.

Cheney, Sheldon. *New World Architecture.* Longmans, Green and Co., London and New York. 1930.

This book traces the development of modern architecture. The illustrations are beautiful and reveal the trend of the Moderns.

Clement, C. E. *Architecture.* Frederick A. Stokes Company, New York. 1886 (out of print).

This book deals with the architecture from ancient times to the present. It locates dates in relation to architectural periods. The book has many beautiful illustrations which are equally as valuable

as the reading material. There is also a complete glossary of technical material.

CLEMENT, C. E. *Handbook of Legendary and Mythological Art.* Houghton Mifflin Company, Boston. 1909.

A handbook of symbolism in church architecture.

FLETCHER, BANISTER. *A History of Architecture.* Charles Scribner's Sons, New York. 1924.

This book has many comparative pictures of different types of architecture. It shows, for instance, a Roman and a Greek Ionic column and parallels their similarities and differences. The reading material is difficult but has much valuable information and many pictures.

HARRISON, W. K., DOBBIN, C. E., and SEXTON, R. W. *School Buildings of Today and Tomorrow.* Architectural Book Publishing Co., Inc., New York. 1931.

This large volume contains photographs, plans, and architects' drawings of modern school buildings and equipment. One chapter of the book, "The Design of the Modern School," deals with the problem of the modern school building and is illustrated with sketches and photographs of modern schools both in America and in foreign countries. The book is too difficult for children to read, but the illustrations are excellent.

HITCHCOCK, HENRY-RUSSELL, JR., and JOHNSON, PHILIP. *The International Style: Architecture Since 1922.* W. W. Norton & Company, Inc. 1932.

HOFFMAN, HERBERT. *Modern Interiors.* William Edward Rudge, New York. 1930.

MCCLEES, HELEN. *The Daily Life of the Greeks and the Romans.* Metropolitan Museum of Art, New York City.

This book is valuable chiefly for its many interesting illustrations. Such chapter headings as Religion, Houses, Furniture, Children, and Education reveal the contents of the book.

MUMFORD, LEWIS. *Sticks and Stones.* Horace Liveright, Inc., New York. 1924.

PARKER, JOHN H. *Concise Glossary of Terms Used in Architecture.* Little, Brown, and Company, Boston. 1910.

This book has many excellent illustrations showing the details of architectural designs. The reading is rather easy. It deals mostly with Grecian, Italian, Roman, and Gothic architecture.

PLATZ, GUSTAV ADOLF. *Die Baukunst der Neuesten Zeit.* Im Propylaën-Verlag, Berlin. 1930.

ROBERTSON, HOWARD. *Architecture Explained.* Doubleday, Doran & Company, Inc., Garden City, N. Y. 1926.

Very good for reading material and for pictures of early American architecture. Stresses the designing art of architecture; therefore, applies chiefly to those who are studying to be architects.

RUSKIN, JOHN. *Seven Lamps of Architecture.* E. P. Dutton and Company, New York. 1906.

This book tells how certain buildings are constructed and gives detailed descriptions of beautiful buildings. The reading is too difficult to be placed in the hands of children.

SEABY, ALLEN. *Art in the Life of Mankind.* Oxford University Press, New York. 1928.

In the chapter, *Houses,* is given the history of the house from the early temples of Egypt to the modern summer homes. The book is useful because it stresses the points in the history of architecture of the different countries.

SMITH, DAVID EUGENE. *Mathematica Gothica,* published by the author. New York City, Teachers College, Columbia University.

The mathematics of cathedral building. "What lesson does Bourges or Tours or Amiens bring to you, or to me, or to any of the visitors of a day, or of a year, etc."

STURGIS, R. *The Appreciation of Architecture.* Doubleday, Doran & Company, Inc., Garden City, N. Y. 1903.

Very difficult reading. Devotes much space to pictures and descriptions of architectural detail.

VANLOON, HENDRIK. *Man, the Miracle Maker.* Horace Liveright, Inc., New York. 1928.

This book is not so much a reference on architecture as it is the history of man's efforts and inventions in the modern world, as is illustrated by such chapter titles as "From Skin to Skyscraper," "From Foot to Flying Machine," etc.

WRIGHT, FRANK LLOYD. *Modern Architecture.* Princeton University Press, Princeton, N. J. 1931.

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This book deals with the style, design, and materials of architecture. The reading is very difficult and the information is vague. Too involved to give to children.

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