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THE EDUCATIONAL MUSEUM OF THE ST. LOUIS PUBLIC SCHOOLS

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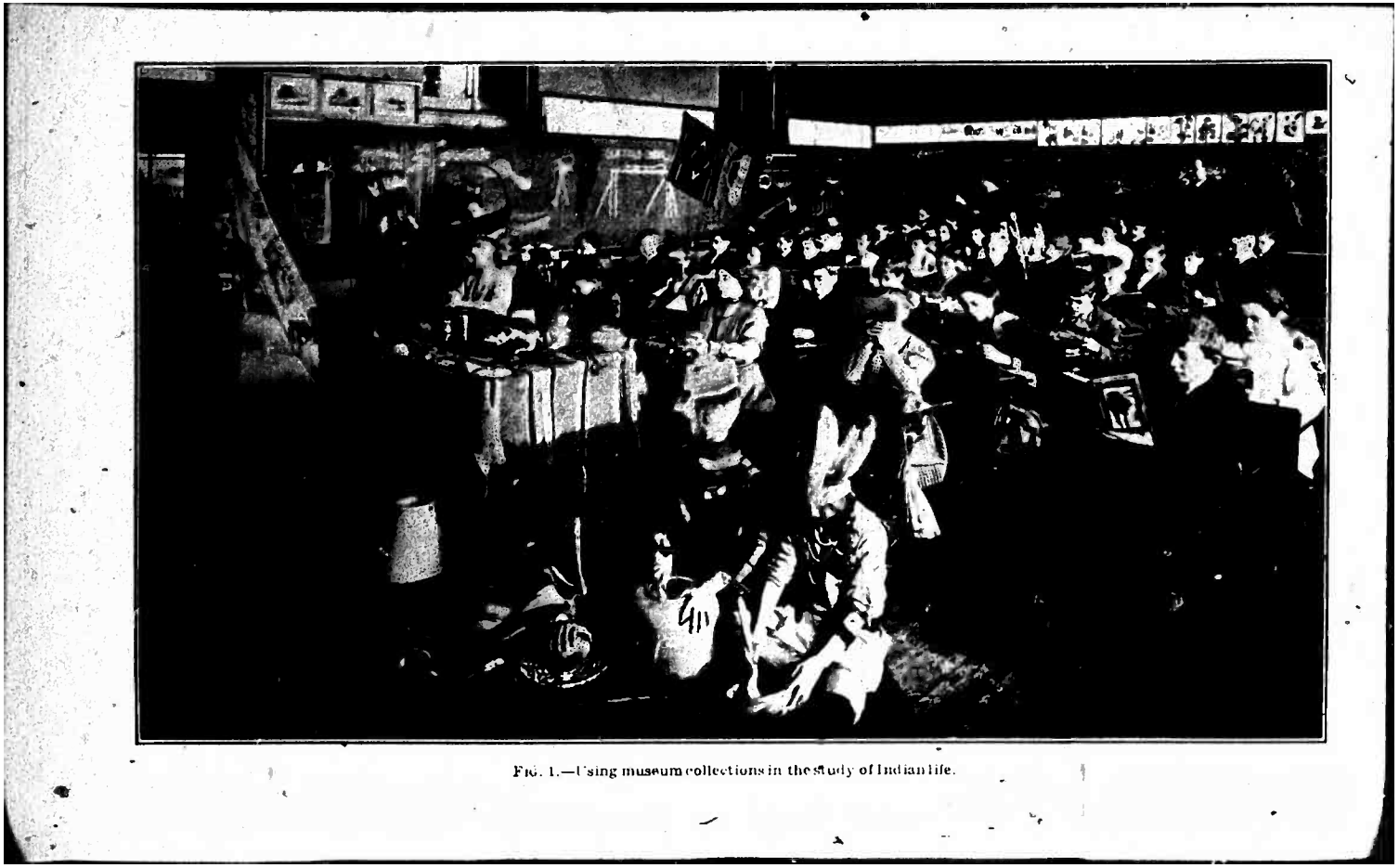

FIG. 1.—Using museum collections in the study of Indian life.

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LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
Washington, January 15, 1915.

SIR: In reply to Polonius' question, "What do you read, my lord?" Hamlet said, "Words, words, words." Such might be the reply of most people in regard to much of their reading, and this is especially true of children in school, whose range of reading extends much more rapidly than the range of their concrete experiences. Careful examination into the contents of children's minds reveals the fact that for much of their reading in geography, history, and other similar subjects they have no interpreting ideas. Teachers spend much time in vain attempts at explanation by means of words little if any better understood than those of the book. Dictionaries can not help much. The meaning of one word is not found in another. The real meaning of a word for any person is the idea with which it has been associated by virtue of the fact that word and idea have at some time come into consciousness together. Ideas are the results of experience. For any accurate ideas of the things of the world at large the child must be taken on extensive journeys or the things of distant places must be brought into the school. For most children the first is clearly impossible. Therefore, from the time of Comenius and his *Orbis Pictus*, teachers have tried to find some means of doing the second. The most successful means yet found is the well-selected and carefully arranged museum, put at the disposal of children and teachers in such way that any portion of its material may be had at the time when it is needed for the illustration of any lesson or the extension of the children's knowledge in regard to any part of the world, its products and industries. I know of no museum that has been made more useful to this end than has the Educational Museum of the St. Louis Public Schools. I therefore asked Mr. Carl Rathmann, assistant superintendent in charge of this museum, to prepare for this bureau some account of the museum and its use in the schools. In reply to this request Mr. Rathmann has submitted the accompanying manuscript, which I recommend for publication as a bulletin of the Bureau of Education.

Respectfully submitted.

P. P. CLAXTON, *Commissioner.*

THE SECRETARY OF THE INTERIOR.

THE EDUCATIONAL MUSEUM OF THE ST. LOUIS PUBLIC SCHOOLS.

To make the child acquainted with the world in which he lives, we must bring him into personal contact with the world. Telling him or having him read about the earth, about the great changes produced on its surface through the activity of nature and man, about the people, their life and work, and their adjustment to their environment, will not give the child vivid and lasting impressions, nor arouse in him the desire and develop the power to do his own exploring and discovering. We must, as O'Shea says, "take him into the world or bring the world to him."

In St. Louis the teachers are given excellent opportunities to put their pupils in touch with the world around them. Entering a schoolroom during a geography lesson, the visitor may find that the children, after a thorough study of the relief map, are transported into the country which is the subject of their lesson. They have before them the typical representatives of the animal world, the minerals, the soil and the industrial products, which they observe, study, and discuss; or they view through the stereoscope or on the screen the surface features, the natural advantages, the scenery, the large cities and their institutions, the people, their occupations, their homes, and their manner of life.

Surrounded by carefully selected objects characteristic of the country, viewing all that is interesting in it through lifelike pictorial illustrations, living, as it were, in the country while studying it, the children receive vivid and permanent impressions of what is taught. The use of such illustrative material satisfies the child's desire for the concrete; it lends life and reality to the work and makes the geography lessons interesting and enjoyable.

The objects and pictures for the illustration of the work in geography, as well as for the lessons in nature study, history, reading, and art, are furnished by the Educational Museum of the Public Schools.

In other cities the public museums have in late years extended the scope of their work of disseminating knowledge to a field where it is of inestimable value. They have opened their great storehouses of information to the public schools and they ask the teachers

to make extensive use of the wonderful things from all parts of the world in connection with their regular school work. Some of the museums send a number of typical collections of illustrative material to the schools. Others invite the teachers to bring their classes to the institution and to give their lessons there, aided by the wealth of interesting specimens placed at their command; still others do both. In this manner the museums enable the teachers of our schools to supplement the textbook and their own statements of facts and descriptions of conditions by the study of real things, and thereby lend life and reality to their work. This practical cooperation of the museums with the schools is hailed by the teachers as one of the most helpful means of enlivening the study of nature and geography,

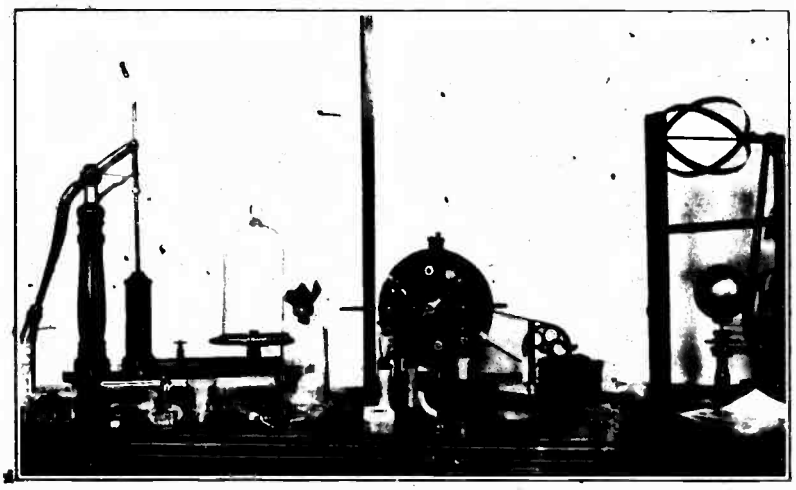

FIG. 2.—A few typical specimens of physics apparatus.

of stimulating the interest and self-activity of the children, and of making school work more enjoyable to both pupils and teachers.

St. Louis has no public museum. Washington University, St. Louis University, the Academy of Sciences, and the Historical Society have their own excellent museums, but these can not aid the schools.

In 1904, St. Louis had within her borders a most magnificent public museum—the World's Fair. The exposition gave St. Louis the opportunity to extend to her schools the same educational advantages that museums give to the schools of other cities.

During the entire period of the exposition, classes from all of our schools visited the fair grounds, accompanied by their teachers. From building to building the little folks wandered, gazing and wondering, eagerly listening to the explanations of teachers and exhibitors. The Government Building, the palaces of Agriculture,

FIG. 3.—Central study hall of Educational Museum.

FIG. 4.—North study hall of Educational Museum.

Fishing and Forestry, Horticulture, Mining and Metallurgy, and Education, and the foreign buildings were crowded with the little visitors every day. Confronted with the representatives of all nations and all races with which they had so far formed but a vague acquaintance through description and pictures, surrounded by a wealth of material from all corners of the world, the children felt themselves transported into distant lands. The cotton industry of the Southern States, the cultivation of rubber in Brazil, of cocoa in Venezuela, of tea in China, of rice in Japan, of the cocoanut in Ceylon, they saw represented by the real products in all the different stages of growth and development. They had read and seen pictures of the wonderful birds and insects of the tropics. Now they could see them in reality, and this made far more vivid and lasting impressions upon them than description and pictures.

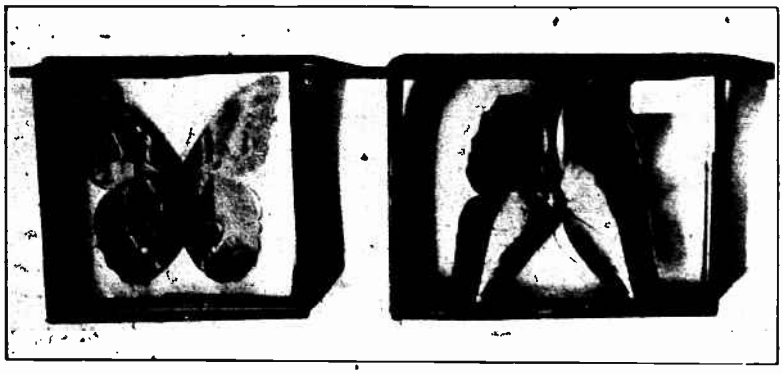

FIG. 5.—Butterfly specimens.

With deep regret principals and teachers saw the close of the fair approach, and with it all the valuable means of stimulating interest in school work disappear. The board of education and the superintendent, realizing the wonderful opportunity of securing a wealth of valuable material for illustrating school work an opportunity which would never return—appealed to the exhibitors to donate parts of their displays to the public schools. A large number of valuable exhibits were secured, and these formed the nucleus of our educational museum.

When the first attempt at a logical arrangement of the articles acquired from the World's Fair was made, it was found that much new material was needed to fill the gaps and to supply the missing links in the chain of groups and collections which were to illustrate the various features of school work. The board of education applied to some of the large museums of our country to help, and they

responded most readily and generously. Large amounts of valuable material were donated by the Field Museum of Natural History of Chicago, the Smithsonian Institution, the Philadelphia museums, and the Public Museum of Milwaukee. The United States Department of Agriculture gave large collections of plants and fibers. The Department of Fisheries contributed specimens of the fishes found in the waters of our country. Owners of mines and quarries sent the needed specimens of the mineral world. Commercial firms in the United States and abroad presented to the museum natural and industrial products of various kinds—such as cotton, wool, silk, rubber, coffee, tea, cork, leather, glass, etc., and exhibits showing the different stages of their development. Teachers and pupils, patrons, and friends of the school helped enthusiastically in adding to the material. The board of education made a liberal appropriation for the purchase of new and duplicate material and for the general maintenance of the museum, and in October, 1904, the institution was ready to begin its work.

A TRAVELING MUSEUM.

In what way can the material be used most profitably by all the schools? Should the institution be a central museum, its contents to be used by all the schools, or should there be an individual museum in each school? These were the next questions.

It was found that it would not be feasible to supply every one of the hundred public schools of the city with a full set of physical apparatus, with large numbers of scientific specimens, or with full geographical collections to illustrate the life of peoples and the products of distant lands.

The expense would be excessive and the material furnished each school inadequate. It was decided that there should be one museum for all the schools.

How should the material be made accessible to the schools? Should the schools go to the museum, or the museum to the schools?

Because the pupils of many of the schools would have to travel several miles to get to the museum, too much time would be lost if the former method were followed. Moreover, the children would regard the trip to the museum and the time spent in it more a pleasure trip or somewhat of a picnic than an occasion for earnest, systematic study of some feature of their school work. In the museum children are surrounded by interesting things from all parts of the world; their interest is scattered, and it is very difficult to concentrate their attention upon the exhibits the teacher wants to discuss with them.

After a very careful consideration of the different possibilities of bringing the schools and the museum together, it was thought best to make the institution a traveling museum which would go to the schools and carry to the teachers the illustrative material which they needed at the time when they needed it.

A MUSEUM ON WHEELS.

The material is sent to the schools by a large automobile truck in the service of the museum. The schools are divided into five sections, each of which has a delivery day once a week. The principal of a school which has its delivery day on Monday asks his teachers on the preceding Friday to send him the numbers of all the collections in the museum catalogue they will need for the illustration of their lessons during the following week. These numbers he inserts in an order blank for the curator, and on the following Monday the wagon delivers the material at the school, taking back at the same time the collections used during the previous week.

WHAT THE MUSEUM CONTAINS.

The material in the museum is arranged and grouped in accordance with the course of study followed in the schools. The following are some of the groups:

Food Products, comprising the cereals in the plant and the grain, and their products; coffee, tea, sugar, cacao, in the various stages of production; spices, etc.

Materials for Clothing.—The various animal and vegetable fibers of the world, and the fabrics made of them.

Tree Products. Domestic and foreign woods; rubber, gutta percha, camphor, cork, etc., in all stages of preparation; materials for dyeing and tanning, etc.

Industrial Products showing the various stages in the manufacture of glass, paper, leather, ink, pen, pencil, needle, etc., besides such products as are made from the materials mentioned in the former groups.

Articles and models illustrating the life and occupations of the different peoples of the world; such as implements, wearing apparel, models of houses, industrial products, etc.

The Animal World, mounted and dried specimens, and specimens in alcohol.

Plants, and models and charts of plants.

Minerals, rocks, and ores.

Apparatus for the illustration of physics and physical geography.

Musical and literary records for phonographs.

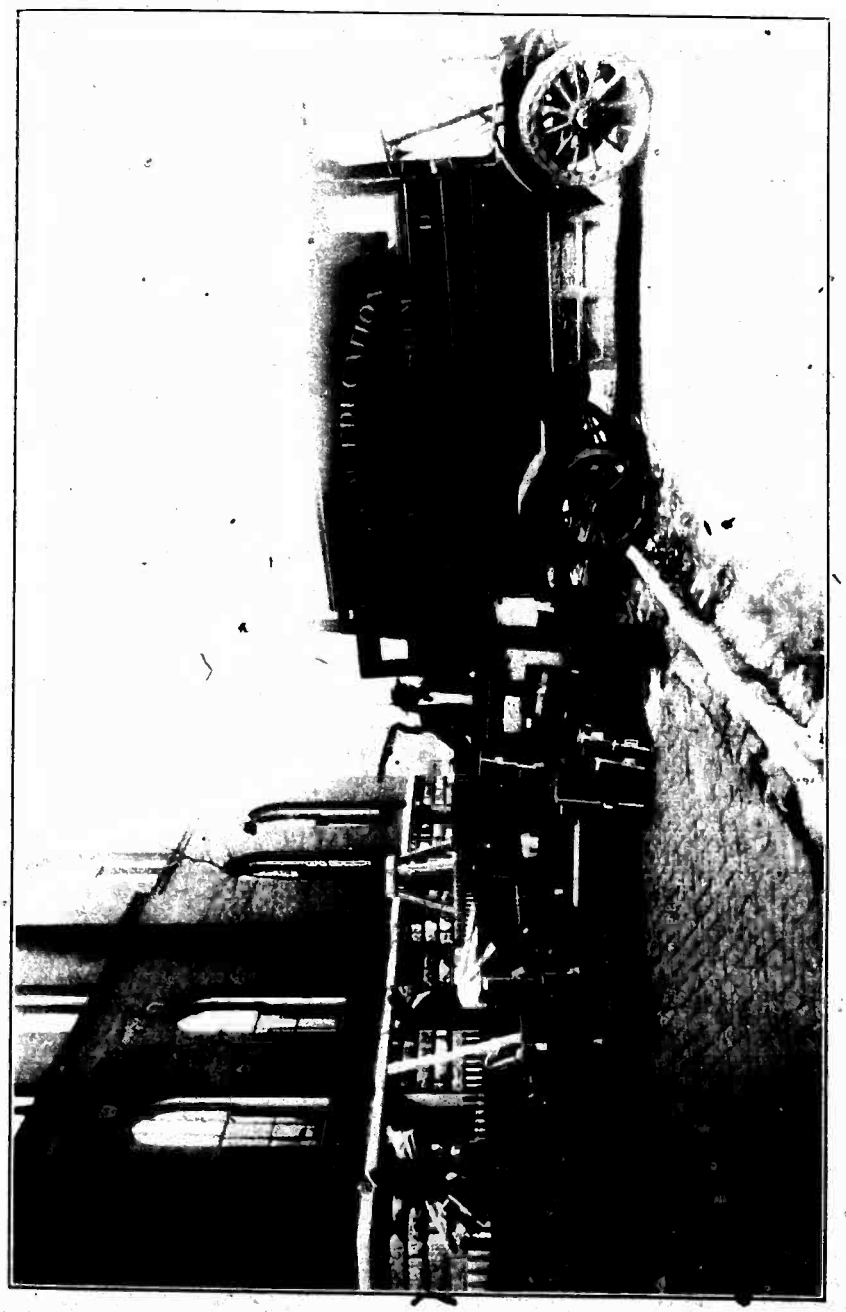

FIG. 6.—Automobile delivery from the museum.

Charts, colored pictures, maps, and objects illustrating history.
Charts illustrating astronomy.
Charts illustrating physiology.
Collections of art objects, and models used by the classes in drawing.
Classified collections of photographs, stereoscopic pictures, and lantern slides to accompany the objects in the preceding groups.

These groups are subdivided into smaller sections, or collections of from 4 to 8 objects, each of which represents a class or family of the group, as, for instance, in the case of birds, collections of wading birds, of owls, of finches, etc. Each collection is accompanied by a number of photographs, stereoscopic pictures, and lantern slides.

The collections are numbered and listed in the museum catalogue. With each article mentioned a brief explanation is given as to its use, where it is found, etc. At the head of each group a number of reference books are mentioned. These books are found in the teachers' library; they give information about all the specimens in the group. Copies of the catalogues are found on the desk of every teacher in the schools.

A FEW TYPICAL GROUPS AND COLLECTIONS.

The following extract from the printed catalogue will show the principle according to which the material is arranged:

MATERIAL FOR CLOTHING.

Reference Books.

Chisholm—Commercial Geography.
Hanan—Textile Fibers of Commerce.
Lyde—Man and His Markets.
Toothaker—Commercial Raw Materials.

COTTON.

Collection 100.

Fibrous portion of fruit of cotton plant. Cotton most extensively used is that cultivated in the southern part of the United States, from Virginia to Texas.

1. Cotton bolls, Louisiana.
2. Cotton, unginned, Texas.
3. Cotton, ginned, Arkansas and Mexico.
4. Cotton seeds.
5. Cottonseed linters.
6. Miniature cotton bale.

Collection 101.—Cotton of Other Countries.

1. Sea-island cotton, West Indies.
2. Peruvian or kidney cotton, Peru.
3. Silk cotton obtained from the Bombax or cotton tree, Honduras and Venezuela.
4. Pods of cotton tree, Philippine Islands.

See p. 44.

FIG. 7. Studying cotton with the aid of museum material.

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Collection 102. Other Cotton Products.

1. Cottonseed oil. Substitute for olive oil; also used for burning in lamps, soap making, and lubricating.
2. Cotton-oil cake. Used as cattle food and fertilizer.
3. Cottonseed meal. Ground cottonseed cake.
4. Cottonseed meal. Cattle food.
5. Cottonseed-oil soap and soap powder.
6. Cottolene. Cooking fat obtained from cottonseed oil.
7. Varieties of paper made from cotton stalks. The bark is separated from the stalk, carded, and heckled, and changed into a pulp from which paper is made.

Collection 103. Manufacture of Cotton.

Glass case showing the various stages of manufacture of cotton goods.

Collection 55. Paper Made from Cotton Stalks.

Varieties of paper made from cotton stalks. The bark is separated from the stalk, carded and heckled, and changed into a pulp from which paper is made.

Collection 56.

Implements used in the manufacture of cotton in the Philippine Islands; (1) Model of cotton crusher; (2) model of spooling apparatus.
Illustrations of cotton and cotton industry.

Collections.

104. Stereoscopic views. Cotton industry of various countries.
105. Cotton industry. Fifteen copies of one view—"Cotton pickers in the field."
106. Cotton industry.—Fifteen copies of one view—"Cotton on the levee, New Orleans."

By means of the cotton exhibit the children are taken to the cotton fields, where they study the plant, the method of preparing the soil, the harvesting; to the cotton gin, where the seed is separated from the lint; to the markets to see the buling and shipping; to the large cotton factories where the lint is spun and woven into fabrics; and to the refineries to learn how cottonseed oil, oil cake, cottolene, and soap are made. How busy and successful human genius has been in devising more adequate contrivances to produce better fabrics and to supply the demands of the world for cotton goods more rapidly is shown by a comparison of the primitive and crude implements used by the inhabitants of the Philippine Islands with the magnificent machinery in the large eastern factories as represented by the stereoscope and lantern slides.

Additional illustrations of the cotton industry are offered by a well-selected collection of lantern slides. These slides may be used to great advantage when cotton raising is discussed in connection with the geography of the Southern States and the cotton industry

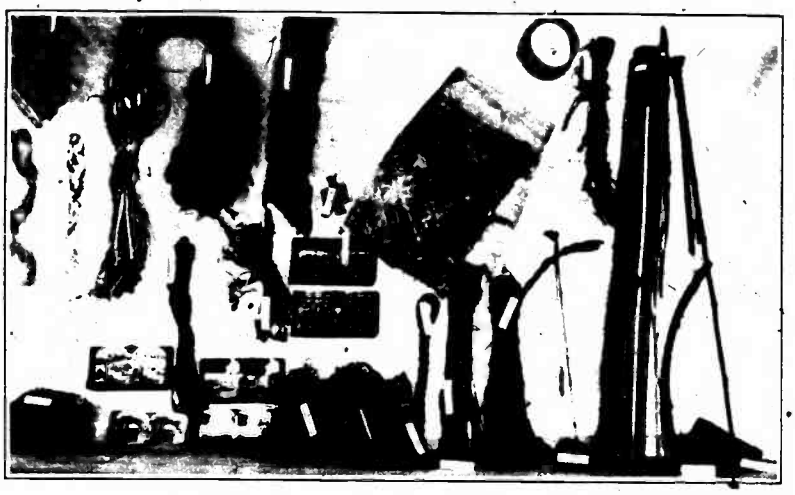


FIG. 8.—Group of fibers.

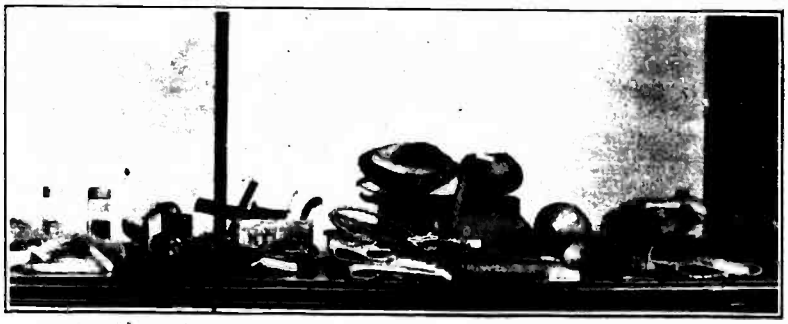
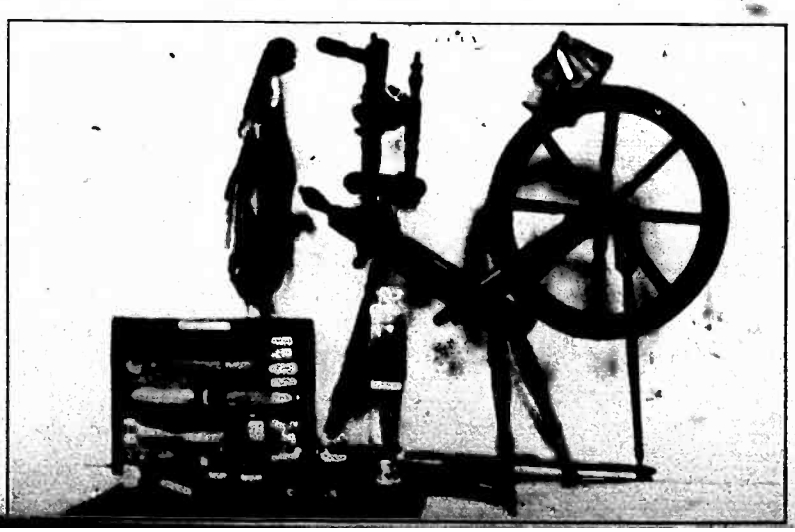


FIG. 9.—A cocoanut collection.



in connection with the Eastern States. The collection consists of the following 17 slides

Lesson 1678. Cotton.

1. Map of United States, showing cotton area.
2. Among the cotton plants. Negroes in field. Louisiana.
3. Topsy among the cotton plants. Louisiana. Little colored girl.
4. Home of a cotton picker. Mississippi. One-story cabin.
5. Bringing in the cotton. Storing it in log house. Louisiana.
6. A cotton gin. Exterior of rude house. Boiler under shed.
7. Cotton-press yard. Cotton packed in bales. New Orleans, La.
8. Cotton at railroad station. Packed in bales.
9. Cotton levee. Ready for shipment. Ocean steamer. Mississippi River. New Orleans, La.
10. Cotton factory. Fall River, Mass. (Iron Mills). Steam power.
11. Cotton factory. Cotton house. Fall River, Mass.
12. Cotton factory. Rear. Covered bridge connecting buildings. Fall River, Mass.
13. Cotton factory, scarding room (English cards). Fall River, Mass.
14. Cotton factory-carding room. Fall River, Mass.
15. Cotton factory-spinning room. Fall River, Mass.
16. Cotton factory-weaving room. Fall River, Mass.
17. Cotton ready for sale. Interior wholesale house. St. Louis.

FLAX.

Reference Books.

Hanan—Textile Fibers of Commerce.

Toothaker—Commercial Raw Materials.

Principal Commercial Plant Fibers—Yearbook of United States Department of Agriculture, 1903.

Collection 118.

The flax plant is found in nearly every country of Europe and in the temperate regions of Asia, Africa, North and South America. In European countries it is cultivated chiefly for its fiber, which is spun into linen; in India and America for the seeds from which linseed oil is obtained.

1. Flax plant. 2. Flax fiber. 3. Flax fiber fabrics.

Collection 119.

Flax seed and its products: (1) Flaxseed. (2) Flaxseed, ground. (3) Linseed oils. (4) Linseed oil cake.

Illustrations of flax and flax industry.

Collections.

120. Stereoscopic views. Various phases of the flax industry.

121. Flax industry—Fifteen copies of one view—"Flax taken from stacks to soak in river—Belgium."

Collection 122.

Spinning wheel.

Some years ago the writer of this bulletin listened to a reading lesson in one of our schools. The subject of the lesson was "Flax." The small pictures of the plant and the fiber in the text gave the

pupils but vague impressions of the things they read about. Upon inquiry he found that neither teacher nor pupils had ever seen the plant, the fiber, or pictures illustrating the various phases of the flax industry. The exhibit furnished by the museum will give the children a better idea of the importance of flax in the economic life of the people. Even the old-fashioned spinning wheel can be actually examined by the children.

Food Products

RICE

Collection 15.

Cultivated in marshy lowlands throughout the Torrid Zone and in the Temperate Zones as far as the thirty-sixth degree of latitude. Staple food of greater number of people than any other grain.

1. Rice plant, Texas.
2. Rice plant, Nicaragua.
3. Rice, unhulled, Madagascar

FIG. 11.—Chart showing Chinese town.

4. Rice, hulled, South Carolina.
5. Rice, hulled and whitened, Mexico.
6. Glutinous rice, Siam.

Collection 16.

Rice Products: (1) Rice flour, (2) rice starch, (3) wafers made from rice. Illustrations of rice and rice fields.

Collections.

17. Stereoscopic views. Various phases of the rice industry.
18. Colored chart. The rice plant and its parts.

The pictures of the rice collection take the children into the rice fields of South Carolina, Nicaragua, Mexico, Japan, the Philippines, and Madagascar. They make the children see and understand that the soil in which rice is grown is low and marshy. In some of the countries the rivers overflow their banks and cover the fields for miles. People actually sow the grains in the water, and when the floods go down, the seeds sink into the soft mud at the bottom and spring up there. In the countries where the rivers do not help by overflowing, the people sow the seeds in trenches in spring and then

FIG. 12.—Studying Japan.

flood the fields. After several days the water is allowed to drain off, and the little plants are seen peeping through the soft, wet mud. When they are about 4 inches above the ground, the water is again let in and allowed to cover the field for about two weeks. This is repeated just before the grain ripens.

All this the pictures and articles tell the children. They tell also how rice is harvested, hulled, bleached, packed, and sent to all parts of the world, and how rice flour, rice starch, and rice paper are made. The stereographs and slides make the children acquainted with the people who are engaged in growing rice, with their manner of life, their homes, their state of civilization, etc. In this way the pupils

gain some conception of the importance of a soil product which is used as food by more people than any other single product.

CORN.

Few people are aware how many different things are made from corn. The following exhibits make the children acquainted with America's most important crop and all its products.

Collection 11.—Indian Corn or Maize.

Native of Mexico. Cultivated in nearly all parts of the world. Best development in North America.

1. Corn on cob, Missouri.
2. Flint corn, yellow, Nicaragua.
3. Flint corn, white, Argentine Republic.
4. Flint corn, red, Mexico.

Collection 12.—Corn Products.

1. Pearl hominy (corn hulled and coarsely ground). 2. Granulated hominy. 3. Corn meal. 4. Cornstarch. 5. Corn sirup, white. 6. Corn sirup, dark.

Collection 13.—Corn Products.

Complete collection of 19 bottles, showing various products of one factory: 1. Corn grains. 2. Corn bran. 3. Refined grits. 4. Gloss starch. 5. Laundry starch. 6. Pearl starch. 7. Powdered starch. 8. Dextrin. 9. Climax sugar. 10. Seventy per cent sugar. 11. Anhydrous sugar. 12. Corn sirup. 13. Neutral glucose. 14. Gluten feed. 15. American gum. 16. British gum. 17. Corn oil. 18. Corn oil cake. 19. Vulcanized corn oil.

Collection 14. Illustrations of Corn and Cornfields.

Stereoscopic views. Corn and corn industry.

TREE PRODUCTS.

DOMESTIC WOODS.

Reference Books.

Apgar—Trees of North America.
Hough—Hand Book of Trees of Northern United States and Canada.
Keeler—Our Native Trees.
Lounsberry—A Guide to the Trees.
Matthews—Familiar Trees.
Rogers—Tree Book.
Stokes—Ten Common Trees.

The collections of domestic woods are mounted on slides, each of which shows a piece of bark, a longitudinal and a cross section of branch, the blossom, the leaf, and the fruit of a tree.

Collection 150.—Domestic Woods.

Woods of the following trees:

1. Horse chestnut. Throughout Europe and the United States. Wood coarse, easily split and durable. Used for railroad ties and fence posts.

2. Linden or basswood. Northern and Middle States. Fiber obtained from inner bark used for making ropes and matting. Wood much used in cabinetwork.

3. Papaw. Central United States. Along streams. Fruit yellowish and fragrant.

4. Beech. Abundant in the northern United States and Canada. Wood hard and heavy; used for many economic purposes.

5. Willow. Growing in damp places throughout the United States. Wood soft; used for carpentry and fuel; branches for basketry.

FIG. 13.—Chart of lime tree.

6. Poplar. Sandy soil. Throughout the United States. Wood white and soft and used for coarse work only.

7. Silver poplar. A native of Europe, Asia, and Africa; has become naturalized throughout northeastern United States and Canada.

8. Cottonwood. Variety of poplar. Mississippi Valley.

Colored charts showing various domestic trees, their bark and leaf, with brief description.

Collection 168. Illustrations of Lumber Industry.

Stereoscopic views. Illustrating lumber industry.

Collections.

169. Lumber industry—Fifteen copies of one view. "Scouring Logs and Hauling Them into Sawmill, Minneapolis, Minn."

170. Lumber industry—Fifteen copies of one view. "Stupendous Log Raft."

171. Lumber industry—Fifteen copies of one view. "Driving Logs Through a Narrow Channel."

FOREIGN WOODS.

Reference Book.

G. S. Boulger. Woods.

Collection 212. Foreign Woods: West Indies.

1. Ebony. Wood of large tree, native of southern India. Deep black, very hard, heavy, and fine-grained. Capable of very high polish. Used mostly for veneer.

2. Lignum vitæ. Blackish, with a greenish tint. Heavy, hard, strong, and close-grained. Difficult to split. Used for ships, pulleys, balls for bowling alleys, mortars and pestles, etc. Found also in Central America and throughout South America.

3. Red cedar. Wood rose-red to brown-red. Light, soft, brittle, and fine-grained. Obnoxious to insects. Used in cabinetmaking, for trunks and cigar boxes.

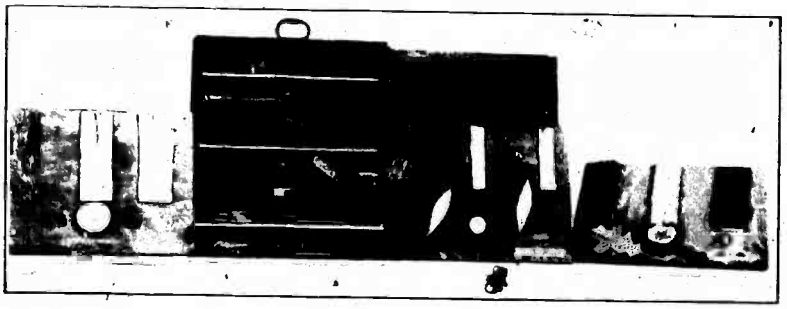


Fig. 14. Typical wood collection in carrying case.

4. Granadillo or Rosewood. Red, handsomely figured, aromatic. Hard. Used for building and furniture.

5. Cabbage Tree Wood. Brown, hard, and durable. Used for mill rollers and in house and shipbuilding.

6. Avocado pear. Grown chiefly for its fruit.

If we could take our pupils into park and forest oftener and study with them the trees in their natural surroundings, their structure, their functions, their relations to man and animal, it would be better. But park and forest are far away from some of the schools, and so we bring as much of them into the schoolroom as possible. On boards 12 by 8 inches in size we show a piece of the bark, a longitudinal section, the same polished, a cross section, the leaf, bud, and fruit of all trees growing in the Mississippi Valley. The pupils observe, study, compare, and discuss these parts. They study large colored charts and photographs representing the tree and its parts.

Stereoscopic views and lantern slides make them acquainted with the industries to which the trees give rise—building, furniture making, introduce them into lumber camps, modes of transporting lumber, sawmills, etc. Then the children are asked to find the living tree, study it, and give the class the result of their observations. In this manner they not only become familiar with the trees but, what is far more important, they acquire an intense interest in the study of Nature and a desire to become acquainted with her in her own domain.

ANIMAL WORLD.

MOUNTED MAMMALS.

Reference Books.

Hornaday—American Natural History.
Holtz—Nature Study.
Linville-Kelley—Textbook in General Zoology.
Parker-Haswell—Zoology.
Stone-Cram—Animals.

FIG. 15.—A few typical specimens of mounted mammals.

Collections.—Mammals: Gnawing Animals.

921. Jack rabbit. Western United States and Canada. Largest of the rabbit family. Home beneath a clump or bush in the prairie. Feeds on vegetables, grass, and weeds. Flesh excellent.

922. Cottontail rabbit. Common in the United States. Digs its burrow in fields, groves, and meadows. Feeds on fruit, vegetables, grass, and weeds. Destructive to young trees by gnawing their bark. Flesh very good.

923. Guinea pig. Domesticated. Wild in the woods of Brazil and Paraguay, where it is called Aperea.

924. Red squirrel. Northern United States and Canada. Quarrelsome, noisy, and mischievous. Feeds on nuts, seeds of pine cones, corn, and vegetables.

925. Western Fox Squirrel. Western United States. Largest of the squirrel family. Feeds on wild fruit, berries, pine cones, and corn. Less provident in preparing for the cold season.

926. Gray squirrel. United States. In hollow branches or trunk of trees. Feeds on fruits, nuts, seeds, and vegetables. Lays in store for winter.

927. Flying squirrel. A squirrel or squirrel-like animal having a fold of skin like a parachute along each side of the body by means of which it is enabled to make long flying leaps through the air.

928. Ground squirrel or striped gopher. Western United States and Canada. Lives in burrows on the prairies. Feeds on nuts and grain, of which large supplies are put away for the winter months. Uses cheek pouches to carry off food.

929. Franklin spermophile or gray gopher. Western United States and Canada. Burrows among thickets in sandy soil. Food and habits like those of gray gopher.

930. Pocket gopher. Mississippi Valley. Burrows in the ground. Lives in communities. Nocturnal. Large cheek pouches opening outside of the mouth. Feeds on roots and vegetables.

931. Western chipmunk. Western region of United States. Among the rocks of the western mountains. Digs burrows in ground, in which it hibernates. Feeds on seeds, grain, berries, grasshoppers, and sometimes robs birds' nests of their eggs.

932. Meadow mouse or prairie vole. Upper Mississippi Valley. Inhabits old ant hills or burrows of its own digging in the prairies. Feeds on nuts, acorns, and grain. Does great damage by gnawing at stalks of corn.

933. Muskrat. Northern and central United States and Canada. Lives in shallow water, ponds, and river banks, using its vertically flattened tail for sculling. In fall constructs houses of rushes and mud. Feeds on roots, young shoots, and fresh-water mussels.

934. White-footed deer mouse. Central United States, east of Rocky Mountains. Most beautiful of mice. In woods. Makes home in hollow roots and branches of trees. Lays up store of nuts, grain, and seeds for winter.

935. Common house mouse. Known everywhere.

936. Brown rat. A rodent of some of the larger species of the genus Mus.

937. Prairie dog. Western United States. Lives in colonies in burrows on the prairies. Feeds on grasses and roots.

938. Ground hog or woodchuck. North America. Burrows in woods, prairies, and meadows. Feeds on roots and vegetables, especially fond of red clover. Hibernates. Peculiar superstition regarding its appearance on 2d of February.

939. Porcupine. Southern Europe. Natural armor of defense formed of sharp stiff bristles which may grow to the length of a foot. Nocturnal. Hibernates in burrows.

BIRDS.

The children know, as a rule, but few of the birds they see around them every day. Through judicious study of the mounted specimens in the schoolroom we awaken their interest and encourage them to go to the parks, to field, and forest, and find the living birds in their proper surroundings, to observe their song, their food, how they build their nests, how they protect themselves, etc., and then give the results to teacher and classmates.

One of the best parts of such training is that it instills in the children love and respect for nature. A bird ceases to be a target for cruel stones when it is looked upon as a friend of man, and as the means of saving the park trees from insect pests.

Collections.—Blackbirds and Orioles.

Migratory. Feed on fruits, seeds, and insects.

401. Red-winged blackbird. Eastern North America. Winters in Southern States. Found in low bushes or reeds in marshes. Feeds on wild rice, seeds, and insects.

402. Yellow-headed blackbird. Western North America. Generally found in marshes, sometimes in company with cowbirds following cattle. No singer.

403. Bronzed grackle. United States. Winters in lower Mississippi Valley. Feeds upon seeds, particularly corn, eggs, and young birds.

404. Great-tailed grackle. British Columbia. Winters in Southern States. Found in prairies and bushy swamps.

405. Purple grackle. Gulf of Mexico to Labrador. Gregarious. Prefers dense pine forests. Feeds on grain, grasshoppers, young birds, and eggs.

406. Meadow lark. Eastern North America. Winters in Southern States. Terrestrial. Protectively colored. Migrates in flocks. Song bird.

FIG. 16.—Owl collection.

407. Baltimore oriole. Eastern North America. Winters in Mexico and Central America. Feeds upon caterpillars and injurious insects. Highly prized for its beauty and song.

408. Orchard oriole. Common in temperate regions of the United States. Winters in Central America. In our orchards and about our homes. Much valued because of song, beauty, and insectivorous habits.

409. Bobolink. Northern United States and Canada. Winters in eastern portion of Southern States and South America. Frequents open fields. Very injurious to rice fields.

410. Cowbird. From Mexico to British America. Winters in Central and Southern States. Walks about among cattle, picking up small insects disturbed by cows in grazing.

Collections.—Foreign Orioles and Grackles.

557. Golden oriole. (Oriolus Kindoo.) India. Outskirts of forests. Very timid. Utters loud, plaintive cry. Feeds on fruit and insects.

558. Minor grackle. (Gracula minor.) Asiatic Islands. Special favorite in China. Feeds on insects and fruits. Very fond of cherries and grapes.

FIG. 17.—Studying birds—Swimmers and waders.

Sponges.

Reference Books.

Cooper—Animal Life in the Sea and on the Land.
Hartwig—The Sea and its Living Wonders.
Holtz—Nature Study.
Hyatt—Commercial and other Sponges.

Live sponges consist of jellylike bodies united in a mass and supported by a framework of horny fibers and needle-shaped objects called spicules. Found in all waters. Sponges for domestic use come from the Red and Mediterranean Seas, the Bahamas, and Florida.

Collection 847.—Horny Sponges.

Include all our commercial forms. Skeleton consists of horny fibers. Generally found in a few fathoms of water, on some rock or coral bottom.

Fig. 18.—Typical specimens of sea life—Nautilus and abalone.

1. Grass sponge. Coast of Florida. Cheapest commercial sponge.
2. Anclote grass sponge. Gulf of Mexico.
3. Sheep's wool sponge. Florida.
4. Cuba velvet sponge, West Indies.
5. Hardhead sponge. Florida.
6. Hircina, Florida.

The variety of form in this species from the flat and spreading to the vase-shaped and branching forms is almost endless.

Collection 848.—Horny Sponges.

1. Florida violet sponge, Florida.
2. Reef sponge, Algoa Bay.

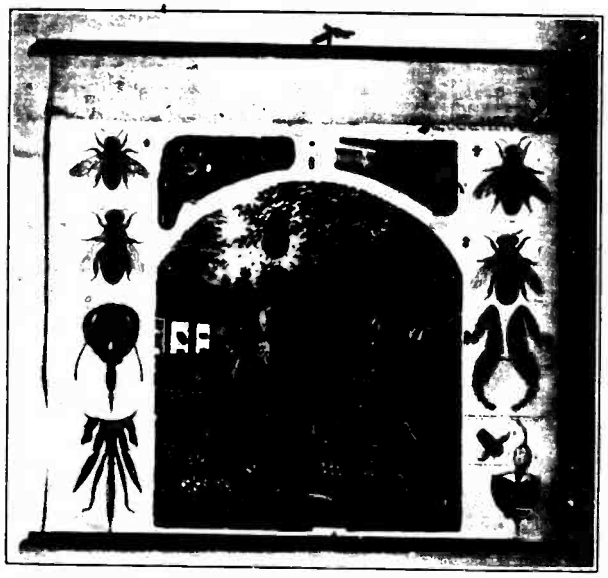


FIG. 19.—The Honey Bee.

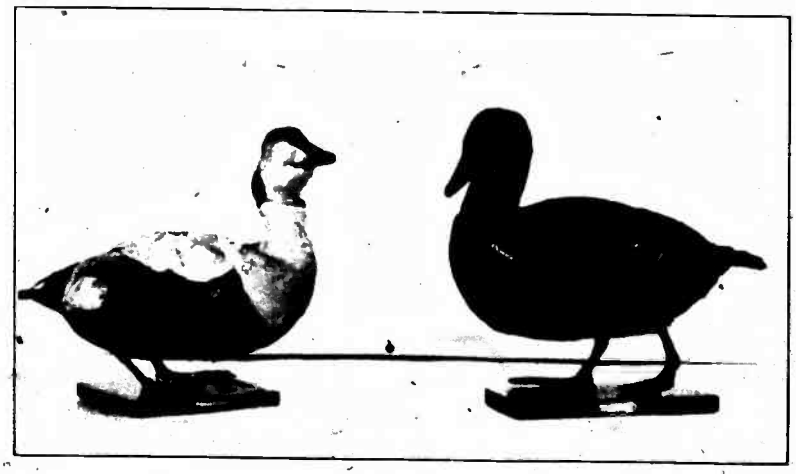


FIG. 20.—From the bird collection.

3. Rope sponge, West Indies.
4. Wire sponge, Gulf of Mexico.
5. Elephant ear, Mediterranean Sea. One of the most valuable toilet sponges.
6. Sponge imbedded in coral. Coast of Florida.

Collection 849.—Horny-Silicious Sponges.

The skeletons are formed of solid horny fibers and silicious or quartzlike spicules. Too coarse to be of commercial value.

1. Pipe sponge, Bahamas.
2. Finger sponge, West Indies.
3. Loggerhead sponge, West Indies.
4. Fringing sponge, West Indies.
5. Golden sponge, Algoa Bay.
6. Violet sponge, Bahamas.
7. Sea cake (Suberites). Cape Cod. Only sponge form which can subsist on the shifting sands. Pores so small that sand can not enter.

Collection 850. Silicious or Glass Sponge.

The highest order of sponges. Have the skeleton almost entirely composed of silicious spicules.

1. Venus flower basket, Philippines.
2. Glass rope sponge, Japan.
3. Sulphur sponge (Cliona). Trinidad. Boring sponge. Penetrates shell of mussels, incloses, and dissolves it. Bores also into limestone.
4. Redbeard sponge (Macrocliona). Forms branching masses a few inches in height.
5. Sugar-loaf sponge (Tethya). Buzzard Bay. The threads at the bottom are curled together in a sort of wool. This catches all the small stones sifted out of the mud and enables the sponges to remain right side up.

Large and well-selected collections of mollusks, sponges, corals, etc., reveal to the child the secrets of the ocean and speak to him in interesting language of the inhabitants of the great waters, their structure, their functions, their manner of life, their ways of procuring food, shelter, and protection, the building of coral islands, reefs, and barriers.

Illustrative Material for Home Geography.

Home geography, like nature study, deals with concrete material and, in teaching it, we must proceed as we would in nature work, either by taking the child to the material or the material to the child. The former method is as superior to the latter as it is in nature study. To give the children clear and lasting impressions of their physical and human environment, they should be brought into personal contact with these environments by the teacher.

Opportunities to study the physical conditions are offered by the many parks of our city which are within easy reach of most of our schools. In them we find roadbeds, slopes, hills, brooks, and ponds,

the careful study of which will enable the children to picture to themselves the features of land and water on the earth. For the study of the human environment, man and his wants, his industrial and commercial pursuits, opportunities are found in abundance in the immediate neighborhood of every schoolhouse. Shops, houses in the course of erection, quarries, etc., should be visited, and the actual work and conditions observed and studied, not in the vague, inaccurate way in which children may have looked at them before, but with a conscious and definite aim. Such lessons afford type lessons which give the teacher the most valuable opportunity for her work in the schoolroom.

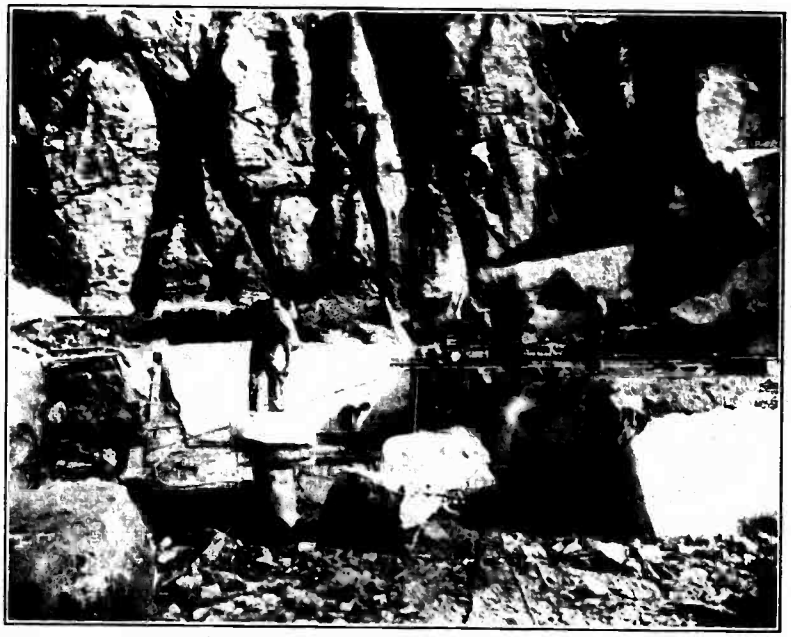


FIG. 21.—Typical photograph showing quarrying.

On the other hand, many things with which the children must become acquainted in their first course in geography must be brought into the schoolroom. These are the materials for food, for clothing, for fuel, etc. Some of them may be supplied by the children themselves, and should be so furnished. But to give the children adequate ideas of the growth and development of this material; of the immense amount of labor, the tools, implements, and machinery it requires to cultivate or manufacture it, and to supply the world with it; of the number of people who find the means to exist in raising or manufacturing it; the wheat, corn, cotton, wool, silk,

coal, iron, etc., should be presented to the child in all the stages of their development. Such material systematically arranged can be furnished only by the museum. The weaving of material, the tools and utensils used by other peoples, such as mentioned in the "Seven Little Sisters" and "All Around the World," are illustrated by the real objects furnished by the museum. The different modes of transportation and the homes of people in foreign lands about which the children read are shown by excellent stereoscopic pictures.

MATHEMATICAL AND PHYSICAL GEOGRAPHY.

Collection 1565.—Advanced Geography—Expansion by Frost.

Apparatus: Test tube, copper beaker, cork. Fill test tube full of water, cork securely. Put into the beaker some cracked ice and salt, one-third salt, two-thirds ice. Set test tube upright into freezing mixture, put beaker on newspaper on desk. Wrap beaker in a towel to exclude heat that would waste ice. What occurs as the water in test tube freezes? Have pupils seen sidewalks raised by frost in the winter time?

Collection 1566. Atmospheric Moisture.

Apparatus: Two-ounce flask, cork, some ice water, some hot water. Fill flask with ice water, cork securely. Invert and let flask stand two or three minutes on desk. Let pupils note formation of dew. Whence came the dew? Now empty flask and refill with hot water. Repeat as before. Note that no dew is formed. On what does formation of dew depend? Will hot air or cold air hold most moisture? If out of doors it is cold, try putting flask of ice water out of window. Let pupils see that cold air will not form dew in contact with cold flask, while hot air will do so.

Collection 1569.—Cloud Formation.

Apparatus: Two-ounce flask, test tube holder, Bunsen burner. Fill flask two-thirds full of water and hold over flame till the water boils. Remove flask and hold at open window for a moment. Let pupils see cloud of escaping steam. Have pupils seen such clouds before? (Steam escaping from engine exhausts.) Bring flask into room—cloud disappears. Why so? Can pupils tell why a morning mist disappears as sun rises? What is dew? Hoarfrost? Their cause?

Collection 1576.—The Seasons.

Apparatus: The tellurian. This can be used with profit to make clear to pupils the inclination of the earth's axis, the varying length of day and night, the difference of temperature between day and night, the succession of the seasons, the equinoxes, etc.

Mathematical and physical geography in the higher grades are considered by almost all teachers the most difficult part in the whole study of geography to present to the children intelligently and intelligibly. It is, if we teach them abstractly. We can not give the children clear ideas and permanent impressions of the shape of the earth, its rotation, directions, change of seasons, cloud formations, the cause and direction of winds, etc., through the textbook or verbal description. The children must see these processes by means of simple apparatus such as the museum furnishes, and the experiments with such apparatus should be performed by the children under

the guidance of the teacher. The whirling table will give the children a better idea of the true shape of the earth than the orange in the textbook. The real compass, not a picture, should be used by the children to determine directions. The simple apparatus of the collection given in the extract from the catalogue, if operated by the pupils, will give them vivid concepts of expansion by frost, atmospheric moisture, and cloud formations. No better device to present the difficult subject of the change of seasons can be found than the tellurian, which makes clear to the children the inclination of the earth's axis, the varying length of day and night, the difference of temperature between day and night, the succession of the seasons, the equinoxes, etc.

FIG. 22.—Studying cloud formation.

Of seacoast, erosion, volcanic action, geysers, divides, canyons, falls, and cataracts, of glaciers, of plains and deserts, no text or verbal description can give the children concepts clear and strong enough. Neither can this be done by the small, flat, illustrations in our textbook. We have excellent stereographs representing them. These stereoscopic pictures do not show flat photography, but supply double vision, giving three dimensions of a detailed diagram instead of two. The child, looking at a scene through the stereoscope, points

not at places on the flat view, but at things and places far behind it, and when he looks into the depth of the landscape he sees them all in their proper proportion and true relation.

Sets of 15 Stereoscopic Views.

To give opportunity for a more intensive study of some of the more important topics of physical and commercial geography, sets of 15 views, each card showing the same picture, are furnished by the

Fig. 23.—Germancastle.

museum. A picture with holder is given to each pupil or each two pupils of a class—every room in the St. Louis schools is divided into two classes—and the teacher has a copy of the view. This arrangement enables the teacher to take her pupils into the situation which is the topic of the lesson. By discussing every detail in the picture, she makes them thoroughly understand, makes them live, what they discover.

Some time ago the writer heard a lesson on marble quarrying. By means of the picture,[1] of which each pupil had a copy, the children

[1] Page 31.

were transported into the mine, as it were, and, under the tactful guidance of the teacher, they found their way into everything the teacher wanted them to learn. In previous lessons the various classes of rocks had been developed, and the order of deposition of the sedimentary rock was studied. The children had brought in samples of sandstone, clay, and marble, and the collection of rocks furnished by the museum had been used to show the limestone in its various degrees of hardness, viz, ooze, coquina, coral, chalk, and marble. After studying the ways in which the rocks were placed in the ground,

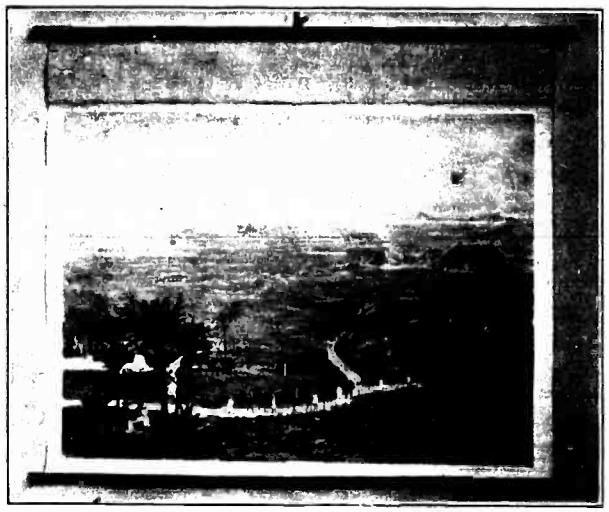


FIG. 21.—Chart showing Desert of Sahara.

a sandstone quarry was visited to observe the method of taking them from the earth. Then the method of quarrying marble was studied by means of a set of stereoscopic pictures, and the following outline used:

Location of quarry.
History of surface as read from picture.
Observation of the details of the picture: Discoloration, stratification, bedding, tunnels, water, pillars, method of drilling. Gadding machine, wedging, channeling machines, derricks.
Comparison with a mine.
Nature's compensations.

The compositions written by the children on the subject of "Marble" showed that they had thoroughly enjoyed their trip to the mine and had received valuable information and training.

The following is a list of the subjects illustrated by sets of 15 stereoscopic views:

Coffee:	Coolies picking coffee—Ceylon.
	Coffee from Porto Rico—Habana wharf, Cuba.
Coconut:	Natives in a coconut grove.
Cotton:	Cotton pickers in the field.
	Cotton on the levee—New Orleans.
Silk:	Separating silk cocoons from their nests—Japan.
	Gathering mulberry leaves for silk worms.
Flax:	Flax taken from stalks to soak in river—Belgium.

FIG. 25.—Norwegian fjord.

Lumber:	Scouring logs and hauling them into sawmill—Minneapolis.
	Stupendous log raft.
Iron:	Steam shovel loading cars.
	Ladles emptying molten metal into molds.
Marble:	Marble quarry in Vermont.
Coal:	Cutting peat in the Allen bogs—Ireland.
	Miners entering shaft—Illinois.
	Digging into the hillside—Pennsylvania.
Seacoasts:	Rock and town of Gibraltar.
Volcanoes:	Fugiyama's vast, mysterious crater.
	Mallibon, strange river of fire—St. Vincent, West Indies.
	Crumbling ash deposits—St. Vincent, West Indies.
Erosion:	The Sinuous Colorado.
Geysers:	"Old Faithful" in action.
Divides:	The Continental Divide.
Canyons:	Down the river and canyon—Yellowstone.

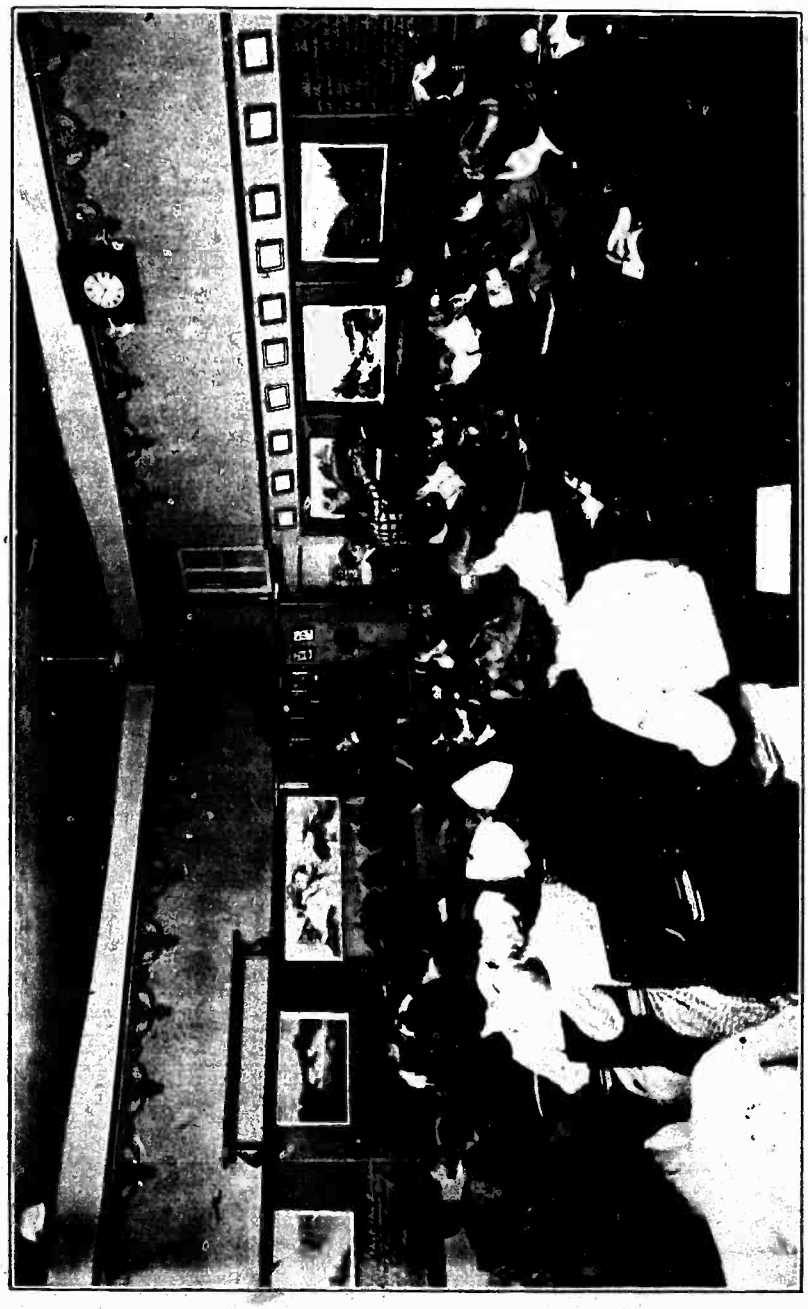


FIG. 26.—Class studying Switzerland, with maps, charts, etc., from the museum.

Falls:	General view of Niagara Falls.
Glaciers:	The great glacier of the Selkirk.
Deserts:	Second pyramids– Egypt.

WHAT MATERIAL MAY BE ORDERED FOR THE STUDY OF SOME OF THE COUNTRIES.

Hundreds of large colored charts help to make facts, conditions, and scenes in geography and history more real and lifelike.

As examples of what the teachers may order from the museum to illustrate the work in geography, the following exhibits may serve:

FIG. 27.—Harbor of Hamburg.

MEXICO.

Food Products	Sugar, coffee, black frijoles, tea, cocoa, vanilla, lentils, alfalfa.
Fibers	Jute, agave, sisal fibers.
Woods	Mahogany, ebony, rosewood, logwood, mora, laurel, guava.
Tree Products	Rubber, tanning bark, dyestuffs.
Medicinal plants	Jalap, cascarilla, and others.
Birds	Motmot, Mexican trogon, coppery tailed trogon, toucan and others.
Minerals, Rocks, and Ores.	Silver, gold, copper, iron, lead, tin, onyx, cinnabar, asphalt.
Sponges.	
Mexican Life and History	Home implements, articles of dress and ornamentation implements of war, idols.

Industrial Products.....Pottery, vases, feather work, models of people following various occupations.
Photographs.....Stereoscopic views and lantern slides.

BRAZIL.

Food Products.....Coffee, cacao, sugar, vanilla, mate tea, cassava, ginger, algarroba, attalea, and para nuts.
Fibers.....Cotton, piassava and agave fibers.
Tree Products.....Rubber, copal, ipecac.
Medicinal Plants.

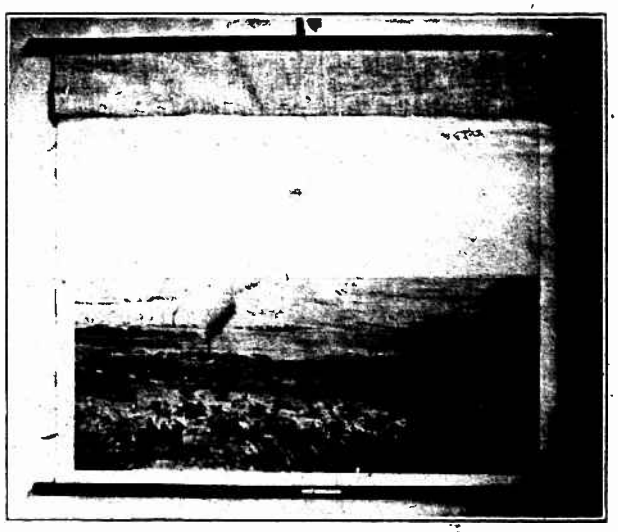


FIG. 28.—The steppes of Russia.

Woods.....Brazil wood, peroba, palisander, Palo d'Arco, guarabu.
Birds.....Resplendent trogon, green trogon, parrots, yellow-throated toucan, pitta or ant thrush, chachalaca, and others.
Insects.....Lanternfly, hercules beetle, Brazilian bee, giant walking stick, Coligo or owl butterfly, blue morpho, white morpho, thysania agrippina.
Reptiles.....Iguana, basilisk.
Amphibia.....Giant toad.
Life.....Large colored chart—The tropical forest, photographs, stereoscopic views and lantern slides.

JAPAN.

Food products.....Rice, tea, spices.
Fibers and grasses.....Silk, jute, hemp, ramie, bamboo.
Tree Products.....Camphor.
Woods.....Sugi or Japanese cedar, Japanese hemlock, Kirui or iron-wood.

Birds.....Green barbet, rose-ringed parakeet, Paradise fly catcher, Myna or crested starling, Drongo, gold bunting, rose and green finch, blue babbler, and others.
Minerals.....Iron, copper, antimony.
Sponges.....Venus flower basket, glass rope sponge.
Clothing.....Various articles of clothing worn by Japanese men, women, and children.
Education.....School work of Japanese children; written compositions, drawings, and domestic art work; 143 large photographs showing school life in Japan.
Life in Japan.....Photographs, stereoscopes, and lantern slides.

Physics.

(A few collections for the illustrations of elementary physics in the Seventh and Eighth grades.)

Collection 1507.—The Lever and Its Uses.

Apparatus: Simple lever, fitted with two weights. Test by putting weights at different distances, so as to balance in each. Prove that if load is farther from pivot (fulcrum), power must also be farther. Also, the contrary. Tell pupils several uses of lever, such as crowbar, scissors, poker, the forearm, etc.

Collection 1520.—Solid Expansion by Heat.

Apparatus: Copper ball and ring, alcohol lamp or Bunsen burner. Test cold ball and ring. Show that ball passes through ring. Now heat ball over lamp. Note how hot ball will no longer pass through cold ring. Why so? What has happened to ball? Plunge ball into water to cool. Wipe dry. Now heat ring. Show that hot ring is a loose fit to ball. Why? Ask children if they have seen blacksmith put tire on wagon wheel. If so, get some one to tell how it was done.

Collection 1549.—Lifting Pump.

Apparatus: Lifting pump, tumbler of water. Let pupils see the parts—suction pipe, cylinder, piston, piston rod and handle, suction valve, piston valve, spout. Ask them to watch working of pump, when suction pipe is put into tumbler and two or three strokes are made. Let some explain the use of each part. Can the pupils tell when the suction valve opens? Why? What is its use? When the piston valve opens? Why? What is its use?

For the illustration of elementary physics in the seventh and eighth grades the museum furnishes the schools the necessary apparatus. Iron, copper, and platinum wire, glass tubes, alcohol lamps and Bunsen burners, microscopes, sonometers, organ pipes, magnets, dry batteries, force and lifting pumps, air pumps, steam engines, etc., are sent to the schools upon requisition of the principal. The catalogue gives descriptions of easy experiments to be performed by the pupils.

Industrial Exhibits—Manufacture of Various Articles.

Reference Books.

Chamberlain—How We Are Sheltered.
Clifford—Everyday Occupations.
Lewis—Modern Industries.
Patton—The Teacher's Aid.

CORK.

Outer bark of the cork oak found in southern Europe and northern Africa. Used for stoppers for bottles and casks, for artificial limbs, for inner soles of shoes, for floats of nets, etc.

Collection 195.- Cork Bark.

1. Cork bark in natural roughness. Portugal.
2. Cork ready for the market. Portugal
3. Cork strips. Portugal.

Collection 196.— Processes Showing Manufacture of Cork Products.

Cork punching; cork tapering; cork gluing; handcut cork; split cork.

FIG. 29.—The cooper's shop. One of a series of charts showing various industries.

Collection 197.—Cork Products.

Cork paper; cork wood; cork caps and stoppers; cork fish bobbers; cork seine; model of sheet-cork insulation; cork handle; cork soles.

Collection 198.— Cork.

Case showing the development of cork products.

INK, PENS, NEEDLES, PENCILS, SHOES.

Collection 1471.—Manufacture of Ink.

Glass case showing the different processes in the manufacture of ink.

Collection 1472.—Manufacture of the Steel Pen.

Glass case showing the various processes in the manufacture of the pen.

Collection 1473.—Manufacture of the Needle.

Glass case showing the different processes in the manufacture of the needle.

Collection 1474.—Manufacture of the Lead Pencil.

Glass case showing the different processes in the manufacture of the lead pencil.

Collection 1479.—Manufacture of Shoes.

Various processes in the manufacture of a shoe and the materials used.

The large number of exhibits showing the various stages in the manufacture of things in daily use, from the raw material to the finished product, are of the highest value. Properly presented and discussed, they enable the child to look into the social, commercial, and industrial life of a people. Few children ready to leave school have any idea of the great number of processes through which an object in daily use—the pencil, the needle, the shoe, or any similar article—has gone in its manufacture. They see only the finished product, and become accustomed to have millions of hands take care of them without even evincing any interest in those who thus serve them. As Dr. Kolar, of Vienna, says:

> The children should be given some idea how much thought, how much care, how much labor there has been expended on the smallest object in use in life. They should learn to follow the evolution of everyday objects, should learn to discover what wonders created by inventive minds and human industry their immediate environment contains, what exertion and what amount of technical study are necessary to make the simplest utensils. We much teach the children to have greater respect not only for the wonders of nature, but also for the wonders of human creation.

HOW THE MATERIAL IS USED.

There is nothing in the traveling museum which can not be used in direct connection with the work of the schools. It contains no curiosities nor abnormities, no freaks of nature. It is not a "cemetery of bric-a-brac," but a nursery of "living thought."

The material is not simply shown the children as new and extraordinary things to satisfy their curiosity. The specimens of mammals, birds, insects, etc., the minerals, the natural and manufactured products of a country, in geography, for instance, are placed before the children to verify what they themselves have discovered through their own observation and reasoning as to the animal and vegetable life, the soil products, and the occupations of the people. The objects are handled, observed, studied, compared with each other and with such as have been considered in connection with other countries, and generally discussed. The pupils determine how the products before

them affect the life of the people, their industries and commerce, their intercourse with other nations, their place among the nations, etc. In many schools each child takes up one of the articles and by his reading gathers all the information he can regarding it and presents such information to the class.

Only such objects and pictures as the teacher really needs to give the children vivid and concrete images of what she aims to present should be sent for and used. To order a great deal of material for one lesson, much of which is only in remote relation to the subject and will tend to scatter the attention of the pupils, is not making the right use of the opportunities the museum affords.

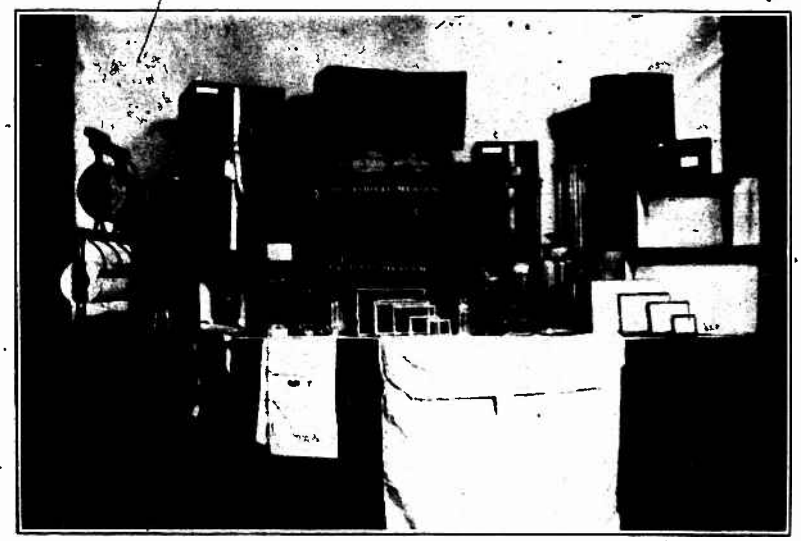


FIG. 30.—Material used to render collections accessible and transportable.

A school museum properly used is a most valuable adjunct to every school system. It enables the schools to give the best sensory training, the aim of which is, as Dr. Judd says, the strengthening of the powers of observation and discrimination, the development of the ability to apprehend the objects of one's environment rapidly and accurately. The child must be given clear, concrete images of things and conditions with which he is to become acquainted. We have failed to do this; our teaching has been too abstract.

Care must be taken not to go to the other extreme, however. The use of illustrative material is, after all, only a means to an end. The right interpretations must be given; the abstractions must be made in due time, in order to give the child the ability to find his way into

the world and to adjust himself to his environment. The material must be so used as to awaken in the child a desire to learn more about the world in which he lives, and to cultivate in him the power to picture to himself facts, conditions, and influences which we have no means of illustrating.

THE TEACHER'S LIBRARY.

In connection with the Educational Museum a teachers' library was opened in 1905. It contains the best publications on philosophy, psychology, education, school management, science, and literature,

FIG. 31.—Teachers' circulating library and study room.

the textbooks used in our own and other countries, reports and courses of study of the schools of the United States and Europe, reference books giving information on all the material in the museum, and the leading educational and other magazines.

The teacher's library aims to put within reach of the teachers everything they need for professional study and self-culture, some of which the public library does not supply. Principals and teachers cooperate with the board of education in making the institution as complete and efficient as it should be. They are asked to state what they would like to have added to the library, and their suggestions and wishes always meet with ready consideration.

The number of volumes in the library is 8,000; 2,000 volumes of the private library of Dr. Soldan, late superintendent of schools of St. Louis, were presented to the institution by his widow.

A catalogue of the library is in the hands of each teacher. She may procure the books in two ways, by calling at the library to select the books she wishes to read or by inserting the title of the book or books in an order blank. The books desired are sent to her school by the museum automobile in the same way in which museum material is sent. The board of education makes it easy for the teachers to avail themselves of the opportunities offered by the library, and these opportunities are most extensively used.

THE MUSEUM IN ITS NEW HOME.

The Educational Museum, at its opening, was housed in some of the rooms of the Wyman School and the adjoining Teachers' College, and remained in these quarters for seven years. During this period the institution grew to such dimensions that the space assigned to it in the two schools became totally inadequate. In 1911 the Peabody School, Eighteenth and Carroll Streets, was closed, because many pupils had left the district, and the others could be taken care of in schools in the neighborhood. A part of the large three-story building, as much as is needed for all the departments of the museum, was so changed as to adapt it to the needs of the institution.

STUDY EXHIBITS.

A large part of the lower floor, including 64 by 32 feet on the north side, 32 by 32 feet on the south side, and the entire corridor, 75 by 15 feet, has been set aside for the display department. One or more collections of each kind sent out by the museum are displayed in proper sequence. These are the study exhibits. They enable the teacher to become thoroughly acquainted with all the museum contains; they make it possible for the teacher to acquire, with the help of the library, such information as may be needed to use the material intelligently and profitably. No normal school or teachers' college can give its students the general information in all departments of science which a modern teacher must possess to go far beyond the text of the book and make her work interesting and valuable. A museum arranged in accordance with the course of study and supplied with a good reference library can do this. The St. Louis teachers make good use of these study exhibits and show no hesitancy in telling how the study and the use of material have widened their horizon, how much better they are prepared for their lessons, and how much more pleasure and satisfaction they find in their work.

The display rooms, however, do not constitute the museum. The museum proper, the traveling museum, is found in thousands of boxes and cases, jars, and bottles, ready to go out and do their work in the schools.

CARE OF THE MATERIAL.

All collections returned from the schools are unpacked, checked, and examined. Soiled or missing labels are at once replaced, damaged articles sent to the repair room, and all glass and boxes and

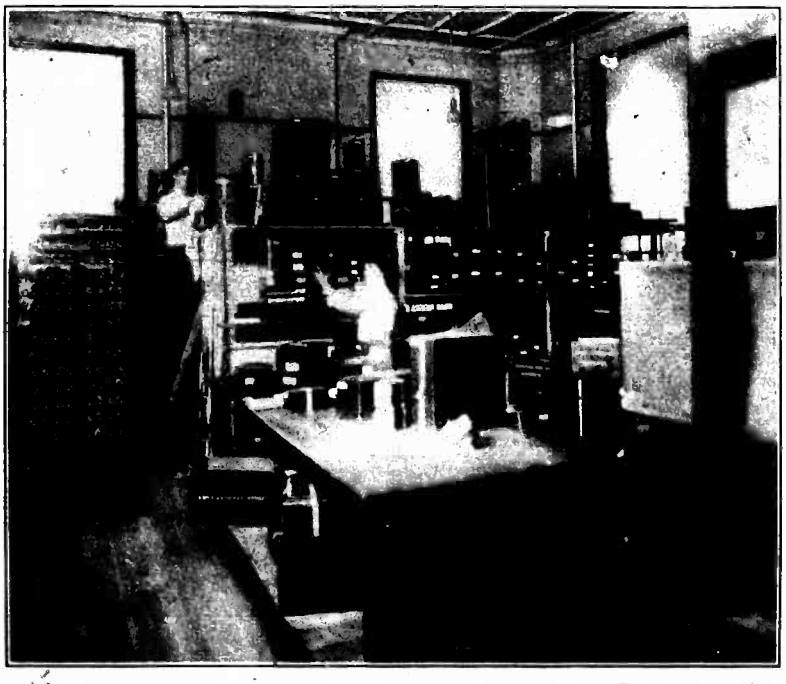


FIG. 32.—Packing room of Educational Museum.

cases carefully cleaned. Two men repack all the material, and make it ready to go out again. The boxes and other receptacles, for the various articles are all so constructed as to give the best protection and to keep the exhibits in usable shape as long as possible. The teachers and pupils seem to place the proper value upon the museum material. They seem to feel that they are responsible for its care and preservation, and they show commendable care in handling it. The annual loss of exhibit material has been comparatively small.

NUMBER OF COLLECTIONS.

The numbers of individual collections in the museum is 1,750; 7,000 individual and duplicate collections constitute the traveling museum. The number of lantern slides is 4,000, of stereoscopes 8,000, and of colored charts and photographs, 2,000.

ANNUAL INCREASE IN ORDERS.

How the popularity of the museum and the library has grown, and to what extent their use in the schools has increased, are shown by the following schedule:

Record of delivery increase.

School years	Museum collections.	Teacher's library books.
1905	5,111	0
1906	11,880	300
1907	16,600	2,718
1908	19,153	3,368
1909	24,152	4,365
1910	29,039	4,790
1911	37,954	9,039
1912	42,994	12,471

EXTENT TO WHICH DIFFERENT GROUPS OF MATERIAL ARE USED.

The following extracts from the museum report state to what extent the different groups of material have been used and which groups are in greater demand than others.

Character of collections ordered, 1912–1913.

Nature of material.	Times ordered by schools.
Food products	7,078
Material for clothing and shelter	8,840
Mounted birds	10,388
Mounted insects and butterflies	1,503
Reptiles, amphibia, and sea life	2,637
Mounted mammals	2,984
Minerals	2,787
Pictorial illustrations, charts, and views	12,213
Material illustrating life of various countries	2,409
Apparatus for physical experiments	2,313
Lantern lessons	4,083
Miscellaneous material	64
Total number of collections ordered	57,299

Library—Classification of books issued, 1912–13.

Reference books, nature study, history, and geography	3,907
Philosophical and psychological books	1,715

	Times ordered by schools.
Pedagogical books	2,214
Literature, English, ethical stories, etc	1,761
Music and art	487
Magazines	2,011
Renewals	376
Total number of books issued	12,471

THE WORKING STAFF OF THE MUSEUM.

The working staff of the institution consists of the assistant superintendent in charge, a curator, two assistants, a librarian, a repairer, a checker, two packers, a chauffeur, and a janitor.

FIG. 33.—Checking room of Educational Museum.

VISITORS.

The museum is open daily, except Sundays, from 9 a. m. to 5 p. m. Visitors are always welcome. Frequently teachers take their classes to the institution after school or on Saturdays, not to give instruction, but to reward them for good work and to make them acquainted with what the museum offers. A large number of teachers from all parts of the country and some from abroad visit the museum every year. The total number of visitors in 1912–13 was 3,885.

Cost of maintenance, 1912-13.

	Expenditures.	Appropriations.
Salaries	$7,592.00	$7,800.00
Expenditures for museum:		
Delivery service	1,800.00	
Duplicate material	867.41	
Permanent equipment	476.20	
Perishable equipment	222.50	
Supplies	108.50	
Kinloch telephone	39.54	
Fumigation	124.30	
Postage	25.00	
Car fare for lantern slides	80.00	
Photographic account	9.50	
Gas and electric light and power	48.74	
Fire extinguishers	42.00	
Drayage, carpenter's and painter's salary (moving to new building)	403.85	
	4,620.50	4,700.00
Total appropriation		12,500.00

The annual expense per pupil is 9½ cents.

HOW CAN A SCHOOL MUSEUM BE ESTABLISHED?

In cities in which there is a public museum opportunities for systematic use of its material should be given the schools. The city museum should establish a school section; it should gather from its stores such material as can and should be used in the schools, and make it possible for the teachers to get it when they need it. This would benefit the museums as much as the schools. The number of people who visit the great storehouses of knowledge in the large cities is deplorably small. The boys and girls who are trained in the schools to use museum material will, when they have become men and women, visit the museum often and will make the most intelligent use of the opportunities they offer. Aided by one of Chicago's public-spirited citizens, Mr. N. W. Harris, the Field Museum of Natural History of Chicago is, at present, planning a systematic cooperation with the city public schools. The Harris Public School Extension of this institution will supply the schools with illustrative material taken from the great museum.

But even in places where there is no public museum, the establishment of a school museum is not as difficult a matter as it is generally supposed to be. A great deal of the material in daily use in the St. Louis schools can be had from commercial firms in the city and in other places, much of it for the asking. The United States Department of Agriculture, the Bureau of Fisheries, as well as privately

owned mines and quarries, will give assistance. Pictures gathered from magazines and railroad and steamship advertisements may be arranged and classified. With material procured in this way as a nucleus and with purchases of other material in this country and abroad, a serviceable school museum can soon be developed. Friends of the school will readily contribute whatever they may have that might be used in the institution. The St. Louis museum has been the grateful recipient of a large number of most valuable donations, a few of which may be mentioned here. The Freie Gemeinde, of St. Louis, presented to the institution a very large collection of valuable minerals. Mr. J. A. Valentine Schmidt turned over to the museum 12 large glass cases of insects, a supply of specimens from which the museum can make up collections for years to come. Miss Mary Franklin gave the museum an extensive collection of articles illustrating Mexican life and history. The Fremont School presented 100 mounted birds and the Garfield School a small museum of articles of various kinds which had been gathered by one of the former principals of the school. Another principal sent a large collection of material gathered in the Philippines. The Missouri, Kansas & Texas Railway gave the museum its comprehensive exhibit of grains and fruits grown in the Western States. A most valuable collection of 900 large photographs representing oriental life and scenery was presented to the institution by Mr. James W. Bell.

OPINIONS OF MEN AND WOMEN IN THE ST. LOUIS SCHOOLS.

The writer feels that in order to give the reader an adequate idea of the value of a new feature of school work, he should not only present his own opinion, but should add the opinions of men and women who do the work in the schools and who have the best opportunity to test the value of this new method of treating certain subjects in the curriculum.

A number of principals of the schools and members of the Teachers' College faculty were asked to state what they thought of the museum as an adjunct to our schools. The following are extracts from their letters:

The success which we have in our work in physical geography with fifth-grade children is due, very largely, to the valuable museum material available for illustration. It is true that some of the difficulties experienced by teachers of physical geography are overcome in our schools by the extensive use of the field trip. The excursion to the park, river, and quarry does much to make this work easier, but mere mention of some of the topics for instruction will show that the excursion, valuable as it is, will not suffice. A glance at the course of study reveals such topics as explanation of day and night, measurement of latitude and longitude, the earth's shape, the compass, atmospheric moisture, cloud formation, the seasons, winds, etc. The Educational Museum provides 25 valuable sets of apparatus which we use and find particularly well adapted to the illustration of these and kindred topics outlined in the course in physical geography.

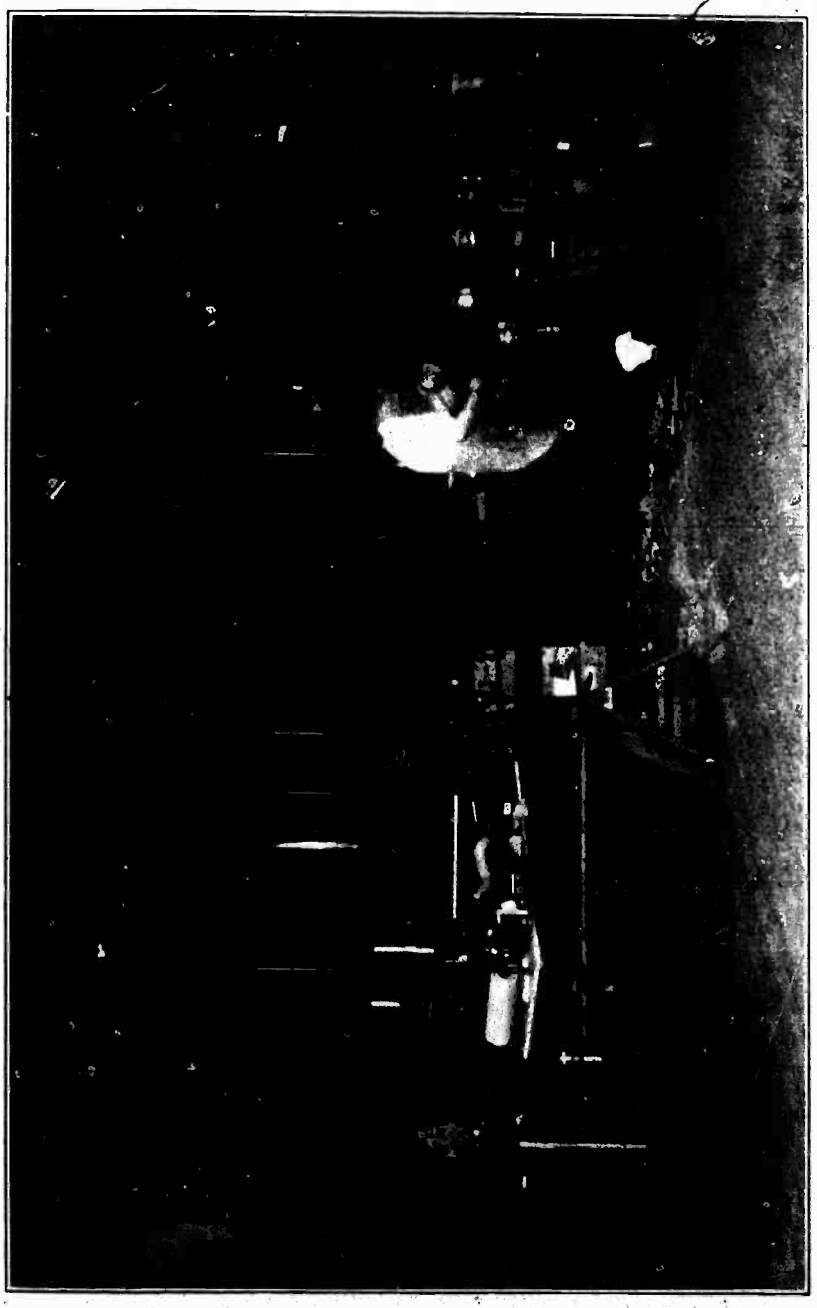


FIG. 34.—Museum repair shop.

The introduction of exhibits of illustrative materials from the public school museum has met a much-felt want in our urban teaching. There are a few extremists in pedagogical theory who still maintain that it is useless to afford children specimens of natural or artificial life which are not directly involved in their own experiences. This principle would narrowly restrict the educational field, eliminating much that is taught and intelligently grasped in geography, natural science, and history. It would mean that the city-bred boy or girl never shall enrich his life with facts and principles that are witnessed only at first hand by those reared in rural districts. It is precisely because many children can not go forth and experience at first hand many of the interesting facts of nature and life that the museum is "put on wheels" and carried to their own schoolroom.

In my extension classes with teachers at the Teachers' College, I have found the museum of the St. Louis schools invaluable, if not almost indispensable. I have had large classes that have pursued the study of St. Louis industries from year to year, and we have found that the museum provides material that makes the whole industrial process clear from the raw material to the completed product. For instance, we have the textile industry in our city, and we can see there the processes by which the raw cotton is made into cloth, but we can not see in the factory how the raw cotton is produced, nor how all the by-products are used. Here the museum steps in and provides us with the necessary steps, so that we may have a complete, concrete history of the cotton textile industry from the time the seed is planted until the cloth comes from the mill. After the cloth leaves the mill, it is easy to follow it until it reaches the consumer. By the aid of the museum we can present the history of the boot and shoe industry; in fact, any of the numerous industries that are represented in our city. We can thus give a comprehensive understanding of our whole industrial life which would not otherwise be possible.

The other day I observed a very interesting review lesson on the Philippine Islands, in which the collections of articles used by the inhabitants and samples of Philippine products from the museum were used. As the lesson proceeded, each pupil went forward and, while exhibiting a certain article or product, recited upon it and its relation to the physical geography and life of the Philippines as best he could from what he had learned from previous study and recitations and from his own reading. This review lesson was full of life and meaning, instead of tiresome to both teacher and pupils, as too many review lessons are. The teacher questioned and suggested as she felt necessary, and the pupils asked questions about matters that were not made plain by the pupil reciting.

Over 150 lantern-slide collections are supplied by the museum. One of the best ways to conduct a lesson of this kind is to have each pupil in the class be responsible for collecting and reporting interesting matter upon one slide. As the lesson proceeds the pupils and teacher ask questions of the one reporting. If the lesson is a story, such as the "Pied Piper," the children may tell the story as the slides are thrown upon the screen. These pictures will give the children excellent suggestions for the illustrative drawing for seat work in language and reading. We have from 2 to 10 lantern lessons at our building every Thursday.

It requires, however, an intelligent use of this material, to produce proper results. The question of method must be worked out carefully for each lesson. A proper introduction, leading the pupils into the proper attitude and spirit, before the material is presented to them, is very essential. They must be prepared for it, and it must be introduced at the "psychological moment," if the best result is to be attained. As

far as possible the pupils, rather than the teacher, should handle and use the material. After the material has been examined and corrected, a summary, giving the application and conclusion, driving home and clinching the salient points of the lesson, should not be omitted. This done, "while the iron is hot," will add 50 per cent to the value of the lesson. There is danger, if this method does not receive careful attention, of the pupils regarding the material as merely amusing and of harmful training instead of beneficial training.

The museum material puts the child in direct touch with the real life and products of the foreign places. The stuffed birds and animals are those that live in the far-away land; coffee, tea, chocolate, bamboo, are the crops cultivated on the farms of strange people; the pictures of the people, of their homes, dress, and occupation, make the child almost as familiar with China, Brazil, or Russia, as he is with his own city.

With this material at hand, it becomes easy to teach our children brought up in a great lowland of the temperate zone, mountain life, torrid and frigid zones, and the industries, life, and customs of a foreign people.

The circulating collections of the Educational Museum serve, in some cases, as a supplement to the textbook; in others, the textbook is a more or less useful supplement to the museum collections. The relative importance depends upon the character of the collection, the text, and the teacher. The museum collections are not an educational fad or busy work, or a cure-all for lazy and indifferent teaching; they are a return to a first principle and a device to restore to classroom instruction the concreteness which, in too many cases, it has lost.

The collections have been especially useful in teaching foreign-born children natural history, geography, and English. Many of them have had considerable mental development in foreign schools in their native tongue, and need as fast as possible to get an acquaintance with their new environment and their adopted language commensurate with their development. To this end simple industrial pictures, typical landscapes, and stuffed birds and animals so disposed that all can see are a very great help.

Children literally clap their hands when the teacher uncovers Mr. Squirrel or the Blue Bird; and there is at once a new interest in the reading or language lessons on these subjects. Likewise the pictures—charts, stereoscopic views or lantern lessons—never fail to bring delight to the children and to enliven interest in the various subjects which they represent. Even if this were the only claim that could be made for them, our museum would be worth while.

Museum collections in my school, however, are not only interesting; they are exceedingly helpful to pupils in gaining many ideas that otherwise would be difficult, if not impossible, to get. Without them, children would fail in many instances through lack of adequate experience to secure the right imagery.

It is manifestly impractical to try to bring school children into first-hand relation with all the processes and objects concerning which we desire them to have quite accurate ideas. The city child is isolated, to a large extent, from nature, from agricultural, mining, and fishing processes and products, and in the present order of things even from industrial, transportation, commercial, and professional activities and results. These deficiencies in experiences gained in the natural routine of life

can be made up in a limited way by excursions to the country, the park, the factory, etc., but only in a limited way. St. Louis has attempted to lessen this deficiency of sense experience through the use of museum materials.

More than 50 per cent of the selections in the readers, used in the first three grades of the St. Louis public schools, are concerning concrete objects and dramatic situations that can be pictured and that are not usually present in the schoolroom. A smaller per cent of the selections in the readers used in the fourth to the eighth grades, inclusive, are of such a nature. In case of such selections, museum materials are very helpful.

Perhaps the best use that can be made of museum materials is in connection with geography teaching. By means of charts, stereoscopic views, lantern slides, typical costumes, etc., the shape, surface, natural scenes of particular beauty, grandeur, or uniqueness, the products of the fine arts, their symbols of patriotism and appreciation, the processes and products of agriculture, mining, forestry, fishing, and the varied industries, the leisure pursuits, dress and appearance, homes, etc., of a people and country may be more vividly and quickly impressed on the minds of the pupils than can possibly be done by the study of the printed page or by spoken words.

We raise a small plat of wheat in the school garden each year. After the wheat has been harvested, we send to the museum for the wheat products. The room that has had charge of the plat of wheat takes the products and prepares stories about each one, using encyclopedias, farmers' bulletins, and books from the library, as well as their geographies and reports of State bureaus.

An announcement is sent through the school that room X is ready to give a lecture upon wheat and wheat products at the nature study period of any room wishing them.

At the time appointed a group from the room that has been studying wheat goes to another room, and each one in turn makes a talk upon some phase of the wheat production, distribution, or manufactured products, illustrating the talk by means of the samples from the museum and the samples from the garden.

After they have gone, the teacher asks the children of the room visited to write letters to the visiting room telling them what they have learned from the lectures.

The following extract from a letter by a member of the faculty of the Teachers' College contains some valuable cautions and suggestions:

"The material in our school museum has been catalogued according to its serviceability for given subjects in the course of study, and provision has been made for the delivery of this material to any school when it is wanted. What is the teacher to do with it? Is she to hold up an object before the class and say, 'See, children, what I hold in my hand,' and then after a few superficial questions proceed as though the object were not there at all? If the objects are to serve more than a merely spectacular purpose, we must decide beforehand just what they are to contribute to the mental development of the child and what methods we must pursue to secure this development.

"The primary and obvious purpose in the use of any objects in instruction is to appeal to the senses of pupils; this means, to the senses of all the pupils in the class and not merely to those of the two or three pupils in the front seats. A method must be found by which this fundamental condition is met.

"Let us now examine, by reference to material typical of the public school museum, how and to what ends such material may be used. What is the purpose of introducing,

let us say, a stuffed squirrel into the schoolroom? Primarily, to give the child concrete images. But the stuffed specimen is, after all, a very imperfect specimen of a squirrel. It is not alive, it is not in its native habitat. It is not so much a squirrel as a symbol of a squirrel. To build up the concrete image, then, the teacher must help the child translate the stuffed specimen into a live animal. We think of an animal as alive when we think of it as functioning. It functions as it attempts to meet its needs, and it meets these needs by the use of such tools as it has, that is, the parts of its body. So, instead of asking, How many legs has this animal? What kind of claws has it? What is the color of its fur? What kind of teeth has it? We say, This animal lives in trees; sometimes it comes down upon the ground. Examine the specimen to see what keeps it from falling when it runs up a tree. How do you suppose it keeps from being caught by its enemies? It eats nuts. What tools can you find with which it may crack the nuts?

"It is by helping the primary grade pupil to realize that the animal has problems like some of our own and ways of solving them unlike our own that we may hope to attain the aim of nature lessons in the lower grades, namely, the development of sympathetic relations between the child and nature. Furthermore, if later these pupils have a lesson on the rabbit or the gopher, either in the same grade or in one above, a comparison of the animals studied will serve to develop the concept rodent.

"Abstract teaching is often condemned as though the abstract in and of itself were an evil. The real evil is our use of the abstract before the pupil has sufficient concrete experience from which to make the abstraction. It is an equally serious evil if the pupil never reaches the abstract, because he thereby fails to acquire the mental freedom which the use of the abstract gives him in the solution of the problems of life."

BULLETIN OF THE BUREAU OF EDUCATION.

[NOTE. With the exceptions indicated, the documents named below will be sent free of charge upon application to the Commissioner of Education, Washington, D. C. Those marked with an asterisk (*) are no longer available for free distribution, but may be had of the Superintendent of Documents, Government Printing Office, Washington, D. C., upon payment of the price stated. Remittances should be made in coin, currency, or money order. Stamps are not accepted. Documents marked with a dagger (†) are out of print.]

1906.

†No. 1. Education bill of 1906 for England and Wales as it passed the House of Commons. A. T. Smith.
†No. 2. German views of American education, with particular reference to industrial development. William N. Hailmann.
*No. 3. State school systems: Legislation and judicial decisions relating to public education, Oct. 1, 1904, to Oct. 1, 1906. Edward C. Elliott. 15 cts.

1907.

†No. 1. The continuation school in the United States. Arthur J. Jones.
†No. 2. Agricultural education, including nature study and school gardens. James R. Jewell.
†No. 3. The auxiliary schools of Germany. Six lectures by B. Maennel.
†No. 4. The elimination of pupils from school. Edward L. Thorndike.

1908.

†No. 1. On the training of persons to teach agriculture in the public schools. Liberty H. Bailey.
*No. 2. List of publications of the United States Bureau of Education, 1867-1907. 10 cts.
*No. 3. Bibliography of education for 1907. James Ingersoll Wyer, jr., and Martha L. Phelps. 10 cts.
†No. 4. Music education in the United States; schools and departments of music. Arthur L. Manchester.
*No. 5. Education in Formosa. Julean H. Arnold. 10 cts.
*No. 6. The apprenticeship system in its relation to industrial education. Carroll D. Wright. 15 cts.
*No. 7. State school systems: II. Legislation and judicial decisions relating to public education, Oct. 1906, to Oct. 1, 1908. Edward C. Elliott. 30 cts.
*No. 8. Statistics of State universities and other institutions of higher education partially supported by the State, 1907-8. 5 cts.

1909.

*No. 1. Facilities for study and research in the offices of the United States Government in Washington. Arthur T. Hadley. 10 cts.
*No. 2. Admission of Chinese students to American colleges. John Fryer. 25 cts.
*No. 3. Daily meals of school children. Caroline L. Hunt. 10 cts.
†No. 4. The teaching staff of secondary schools in the United States; amount of education, length of experience, salaries. Edward L. Thorndike.
No. 5. Statistics of public, society, and school libraries in 1908.
*No. 6. Instruction in the fine and manual arts in the United States. A statistical monograph. Henry T. Bailey. 15 cts.
No. 7. Index to the Reports of the Commissioner of Education, 1867-1907.
*No. 8. A teacher's professional library. Classified list of 100 titles. 5 cts.
*No. 9. Bibliography of education for 1908-9. 10 cts.
No. 10. Education for efficiency in railroad service. I. Shirley Eaton.
*No. 11. Statistics of State universities and other institutions of higher education partially supported by the State, 1908-9. 5 cts.

1910.

*No. 1. The movement for reform in the teaching of religion in the public schools of Saxony. Arley B. Show. 5 cts.
No. 2. State school systems: III. Legislation and judicial decisions relating to public education, Oct. 1, 1908, to Oct. 1, 1909. Edward C. Elliott.
†No. 3. List of publications of the United States Bureau of Education, 1867-1910.
*No. 4. The biological stations of Europe. Charles A. Kofoid. 50 cts.
*No. 5. American schoolhouses. Fletcher B. Dresslar. 75 cts.
†No. 6. Statistics of State universities and other institutions of higher education partially supported by the State, 1909-10.

1911.

*No. 1. Bibliography of science teaching. 5 cts.
*No. 2. Opportunities for graduate study in agriculture in the United States. A. C. Monahan. 5 cts.
*No. 3. Agencies for the improvement of teachers in service. William C. Ruediger. 15 cts.
*No. 4. Report of the commission appointed to study the system of education in the public schools of Baltimore. 10 cts.
*No. 5. Age and grade census of schools and colleges. George D. Strayer. 10 cts.
*No. 6. Graduate work in mathematics in universities and in other institutions of like grade in the United States. 5 cts.
†No. 7. Undergraduate work in mathematics in colleges and universities.
†No. 8. Examinations in mathematics, other than those set by the teacher for his own classes.
No. 9. Mathematics in the technological schools of collegiate grade in the United States.
†No. 10. Bibliography of education for 1909–10.
†No. 11. Bibliography of child study for the years 1908–9.
†No. 12. Training of teachers of elementary and secondary mathematics.
*No. 13. Mathematics in the elementary schools of the United States. 15 cts.
*No. 14. Provision for exceptional children in the public schools. J. H. Van Sickle, Lightner Witmer, and Leonard P. Ayres. 10 cts.
*No. 15. Educational system of China as recently reconstructed. Harry E. King. 10 cts.
†No. 16. Mathematics in the public and private secondary schools of the United States.
†No. 17. List of publications of the United States Bureau of Education, October, 1911.
*No. 18. Teachers' certificates issued under general State laws and regulations. Harlan Updegraff. 20 cts.
No. 19. Statistics of State universities and other institutions of higher education partially supported by the State, 1910–11.

1912.

*No. 1. A course of study for the preparation of rural-school teachers. F. Mutchler and W. J. Craig. 5 cts.
†No. 2. Mathematics at West Point and Annapolis.
*No. 3. Report of committee on uniform records and reports. 5 cts.
*No. 4. Mathematics in technical secondary schools in the United States. 5 cts.
*No. 5. A study of expenses of city school systems. Harlan Updegraff. 10 cts.
*No. 6. Agricultural education in secondary schools. 10 cts.
*No. 7. Educational status of nursing. M. Adelaide Nutting. 10 cts.
*No. 8. Peace day. Fannie Fern Andrews. 5 cts. [Later publication, 1913, No. 12. 10 cts.]
*No. 9. Country schools for city boys. William S. Myers. 10 cts.
†No. 10. Bibliography of education in agriculture and home economics.
†No. 11. Current educational topics. No. I.
†No. 12. Dutch schools of New Netherland and colonial New York. William H. Kilpatrick.
*No. 13. Influences tending to improve the work of the teacher of mathematics. 5 cts.
*No. 14. Report of the American commissioners of the international commission on the teaching of mathematics. 10 cts.
†No. 15. Current educational topics. No. II.
†No. 16. The reorganized school playground. Henry S. Curtis.
*No. 17. The Montessori system of education. Anna T. Smith. 5 cts.
*No. 18. Teaching language through agriculture and domestic science. M. A. Leipor. 5 cts.
*No. 19. Professional distribution of college and university graduates. Bailey B. Burritt. 10 cts.
†No. 20. Readjustment of a rural high school to the needs of the community. H. A. Brown.
†No. 21. Urban and rural common-school statistics. Harlan Updegraff and William R. Hood.
No. 22. Public and private high schools.
*No. 23. Special collections in libraries in the United States. W. D. Johnston and L. G. Mudge. 10 cts.
†No. 24. Current educational topics. No. III.
†No. 25. List of publications of the United States Bureau of Education, 1912.
†No. 26. Bibliography of child study for the years 1910–11.
No. 27. History of public-school education in Arkansas. Stephen B. Weeks.
*No. 28. Cultivating school grounds in Wake County, N. C. Zebulon Judd. 5 cts.
No. 29. Bibliography of the teaching of mathematics, 1900–1912. D. E. Smith and Chas. Goldziher.
No. 30. Latin-American universities and special schools. Edgar E. Brandon.
*No. 31. Educational directory, 1912. 10 cts.
*No. 32. Bibliography of exceptional children and their education. Arthur MacDonald. 5 cts.
No. 33. Statistics of State universities and other institutions of higher education partially supported by the State, 1912.

1913.

No. 1. Monthly record of current educational publications, January, 1913.
*No. 2. Training courses for rural teachers. A. C. Monahan and R. H. Wright. 5 cts.
*No. 3. The teaching of modern languages in the United States. Charles H. Handschin. 15 cts.
*No. 4. Present standards of higher education in the United States. George E. MacLean. 20 cts.
†No. 5. Monthly record of current educational publications. February, 1913.

*No. 6. Agricultural instruction in high schools. C. H. Robison and F. B. Jenks. 10 cts.
*No. 7. College entrance requirements. Clarence D. Kingsley. 15 cts.
*No. 8. The status of rural education in the United States. A. C. Monahan. 15 cts.
†No. 9. Consular reports on continuation schools in Prussia.
†No. 10. Monthly record of current educational publications, March, 1913.
†No. 11. Monthly record of current educational publications, April, 1913.
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