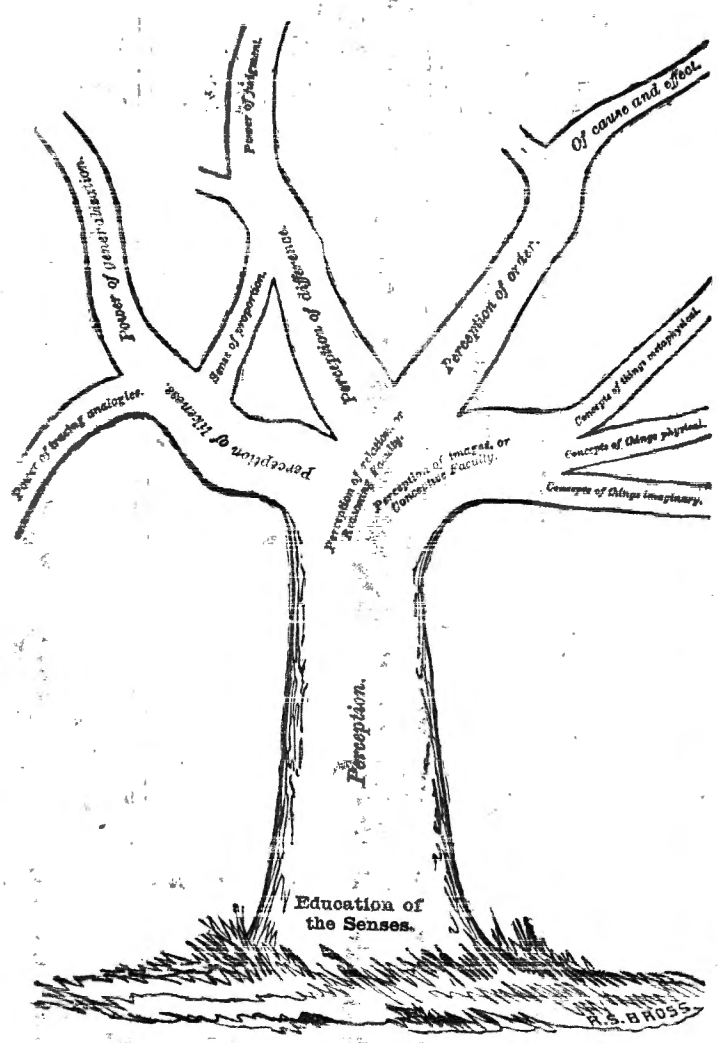

A MANUAL

OF

ELEMENTARY INSTRUCTION,

FOR THE

USE OF PUBLIC AND PRIVATE SCHOOLS AND NORMAL CLASSES;

CONTAINING A GRADUATED COURSE OF

OBJECT LESSONS

FOR

TRAINING THE SENSES AND DEVELOPING THE FACULTIES OF CHILDREN.

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PREFACE.

For many years there has been a growing conviction in the minds of the thinking men of this country, that our methods of primary instruction are very defective, because they are not properly adapted either to the mental, moral, or physical conditions of childhood. But little reference has hitherto been had to any natural order in the development of the faculties, or to the many peculiar characteristics of children. Memory, by no means the most important of the infant faculties, and reason, at this age but faintly developed, have been severely taxed, while but little direct systematic effort has been made to awaken and quicken the *perceptive faculties*, which are the first to develop themselves, and upon the proper cultivation of which we must depend for success in all our future educational processes. Even in schools where better views have prevailed, the want of some systematic exercises, with proper apparatus and facilities for putting them into practice, has been strongly felt.

The design of this work is to meet this demand: to present a *definite course* of *elementary instruction* adapted to philosophic views of the "laws of childhood."

We do not claim for it originality, either in thought or method. It is now a full half century since that distinguished educational reformer, Pestalozzi, to a great

extent gave expression and embodiment to the principles and methods herein contained.

Important modifications have however been made; many errors both in principles and practice have been eradicated, and we are now able to bring to bear the suggestions of some of the most distinguished educators in Europe, based upon many years of careful study and experiment.

The work upon which this is founded, and from which, with the kind consent of its authoress, Miss Elizabeth Mayo, we have largely drawn, is, as stated in her preface, "A Manual, in two volumes, containing the essential portions of the five in which alone such help has hitherto been attainable; and this, too, with the addition of much valuable matter which is now published for the first time."

This work, entitled "Manual of Elementary Instruction," has been compiled within the past year, and brings down to us the light and experience of the best schools of Europe, where these methods have been longest and most thoroughly tested.

She further says, "The whole work has been carefully reconstructed on a plan which presents principles and practice in immediate connection, in order to illustrate their mutual dependence; all details of practice being exhibited as flowing naturally from the first truths on which they are founded."

While the general plan of this work has been followed, and some of the lessons adopted with slight changes, a large proportion of original matter has been added, and the whole arranged with special reference to the wants of our American schools.

The Lessons on Objects, Color, Moral Instruction, Lessons on Animals, and the Introduction have been made up from the original manuscripts of Miss M. E.

M. Jones, with such exceptions as are indicated, and the whole arranged by her. For more than fifteen years this lady was engaged in training teachers in these methods in the Home and Colonial Training Institution, London, and has been connected with the schools of this country sufficiently long to understand something of their wants.

Prof. Hermann Krusi* is the author of the Lessons on Form and Inventive Drawing. He has also rewritten and arranged the third step in Number. His suggestions on many other points have been very valuable. We can but congratulate ourselves and those engaged in primary instruction for this timely aid from one so eminently fitted for the work.†

Of the remaining subjects, Reading has been entirely rewritten. The Lessons on Place or Geography have been slightly changed, introducing two or three original sketches of lessons in the first step, and so changing the third step as to adapt it to our American locality. Some changes have also been made in the Lessons on Sound, Size, and Weight; new matter added, and, in two or three instances, substituted for that contained in the old volumes.

While these lessons are prepared for primary schools, they are also arranged with special reference to use in

* At present teacher in the Oswego Training School.

† Prof. K. was born, as it were, in the very school of Pestalozzi, in which his father was for twenty years a leading and active teacher. For ten years he was engaged with his father in teaching a government school for the training of teachers in Pestalozzian principles, in one of the cantons of Switzerland, his native country. After this, he was for six years engaged in the Home and Colonial Institution, working out and adapting these methods to the English schools; and it was here that he first brought out the Inventive Drawing. In this country he has been for several years engaged in teaching normal schools and teachers' institutes. He has studied carefully the characteristics of our schools and people; and is, in every way, abundantly qualified to adapt this system to our peculiarities and wants.

Normal and Training classes. Model lessons are given, and then subjects suggested on which similar lessons may be drawn up. The models should be carefully examined and analyzed, and, in the case of classes in training, the original sketches should in every instance be submitted to the criticism of the teacher. By individual teachers, these sketches may be written out and used as lessons in their schools. In some of the lessons, general directions only are given; in others, these directions are more particular; while many are drawn out at full length, including both questions and answers. In any case, they are only designed as suggestions and models to guide teachers in working out their *own plans and methods.* Teachers who confine themselves simply to the lessons presented in this book, and to their exact minutiæ, can but fail in their work. To be truly successful, they must catch the spirit and philosophy of the system, and work it out somewhat in their *own way;* of course, always conforming to the principles upon which it is based: these we believe to be sound and philosophical, and they should never be violated.

The lessons that have been taken with no alteration, other than an occasional verbal expression, have been indicated either in the index, or in the body of the work where they occur, by the letter *M.*

It is now more than four years since these methods were practically and thoroughly introduced into the Oswego schools, and from a constant and careful observation of their working, we feel that we are in some degree prepared to judge as to what is wanted in a book of this kind for our teachers and schools; and we trust we may not be disappointed in the hope that it will meet these wants.

The subjects are arranged into steps, simply with reference to the order of time in which it is thought various

portions of the work may be accomplished. All first-step lessons are designed for children from four to five years of age, or during the first year of their school life. In the same way the second step is designed for the second year, and the third step for the third year; thus covering the time usually allotted to our primary departments in towns where the schools are graded. In some instances a fourth step is added, which is designed for the next grade. The order of succession in which the various subjects are arranged, has no reference to any order in which it may be supposed they should be taken up. While it is the design that the lessons of each step, in every subject, shall be taken up at the same stage of the child's development, it is not expected that they will all be treated simultaneously. From three to five only are taken at once, and these are carried on until the interest of the children begins to flag, when they are changed for other subjects, which in their turn are to be changed, as the children weary, for others still, until we again return to the first course, to resume it, after a rapid review, where we left it. This necessity for change with little children cannot be too carefully observed; for no matter how interesting the subject is at first, they will in time tire of it; and a lively interest can only be maintained by change. Reading, spelling, and number are the only subjects that are constant. With the youngest children the programme should change fortnightly, and with the older ones monthly. In the Appendix may be seen some programmes of the Oswego schools, which will give a very good idea of the way in which these may be arranged.

In the country schools, where no such gradation and classification are possible, where the teachers find it impracticable to take up all the topics, as they usually will, they must confine themselves to those which seem to them of the most practical importance; as, for instance, Moral

Instruction, Reading, Geography, Number, Language, Form, Color, and Size.

Others might make a different selection of subjects: we only call attention to this, by way of expressing our view of the importance of doing well and thoroughly whatever is undertaken. It may seem difficult to make a selection of subjects where all are important; but it is better to leave half of them untouched than to undertake to do all, and do nothing as it should be done. Whatever is taught, let it be taught with reference to correct principles.

E. A. SHELDON.

OSWEGO, *Aug.* 25, 1862.

Explanation of Abbreviations.

S. R.—Simultaneous repetition.
W. B.—Write on the board.
R. T.—Repeat together.

CONTENTS

Abbreviations used in the Work.

S. R. Simultaneous Repetition.
R. T. Repeat Together.
W. B. Write on the Board.

MANUAL

OF

ELEMENTARY INSTRUCTION.

INTRODUCTION.

I.—Necessity of Training.

WERE we to undertake to discuss the importance of a regular apprenticeship to the mechanic who builds houses or makes machines, or of a professional education to the artist, the lawyer, or the physician, we should expose ourselves to public ridicule. It is too self-evident to admit of sober discussion. All regard it a necessity. And even when a thorough professional education has been obtained, or a complete term of service as apprentice served, we are slow to employ them until their success has been tested by long *experience*. We are slow to trust the setting of a broken bone to one who has not given *practical* demonstrations of his skill. And yet these things are important only in a physical sense—the lowest of all human wants and necessities. How much more, then, would it seem important that those to whom we intrust the moral and intellectual destiny of the race should be carefully educated and prepared with special reference to their work!

It would seem too obvious to require an argument, that every

teacher should clearly comprehend the character of the infant mind, and its mode of operation—the way in which each faculty stands related to the other, and the order of its evolution—as also the related order of appliances in the process of development, together with a knowledge of the many striking peculiarities and characteristics of children. It is clear that without this knowledge, teachers go blindly at their work, and can but fall into many and grievous errors. One thing is certain, that with the principles and methods here discussed, no one can hope to succeed who does not carefully study and intelligently practise them.

II.—Pestalozzian Plans and Principles.

There are several different ways of giving a lesson.

EXAMPLE.—*Six ways of giving a Lesson on a Plant.*

1. Account of the plant learned by children from a book, and repeated to the teacher.

2. Description learned and repeated as before, teacher afterward explaining the meaning.

3. Piece first explained by the teacher, then learned by the children, and repeated.

4. Picture shown—parts pointed out by teacher. Description learned, and repeated as before.

5. Specimens given—parts examined first by teacher, then observed by the children.

6. Specimens distributed—parts found out by the children, who frame a description, which is put on the board and committed to memory.

We need not add that the latter is the correct method.

All lessons should be given in accordance with the following principles, which were laid down by Pestalozzi:

1. Activity is a law of childhood. Accustom the child to do—educate the hand.

2. Cultivate the faculties in their natural order—first form the mind, then furnish it.

3. Begin with the senses, and never tell a child what he can discover for himself.

4. Reduce every subject to its elements—one difficulty at a time is enough for a child.

5. Proceed step by step. Be thorough. The measure of information is not what the teacher can give, but what the child can receive.

6. Let every lesson have a point; either immediate or remote.

7. Develop the idea—then give the term—cultivate language.

8. Proceed from the known to the unknown—from the particular to the general—from the concrete to the abstract—from the simple to the more difficult.

9. First synthesis, then analysis—not the order of the subject, but the order of nature.

Of course, the educational teacher, in addressing a class of students, would explain and illustrate these principles. In order to ascertain whether they are thoroughly comprehended, the following questions may be put. Answers should be given in writing.

QUESTIONS.

1. A teacher begins Arithmetic by teaching a child to count orally, 1, 2, 3, 4, &c. What principle is violated?

2. A teacher teaches multiplication by letting the children sing the tables. What principle is violated?

3. He begins Geography by use of globes, pointing out continents, &c. What principle is violated?

4. He begins Natural History by taking the children into a museum where there are specimens of all kinds, and makes a classification. What principle is violated?

5. To develop an idea, he begins by saying: "Children, I am going to teach you something: 'All things through which

we can see clearly are transparent.' Look at this piece of glass." What principle is violated?

6. Having developed an idea, he omits to give the term or put it on the board. What principle is violated?

7. He gives a lesson on coal, without presenting the object. What principle is violated?

8. He gives a lesson without observing any divisions either by S. R. (simultaneous repetition), or by W. B. (writing on the board). What principle is violated?

9. He teaches Reading by the same method. What principle is violated?

10. He adopts a uniform plan in all lessons, so that the children always know in what order a subject will be represented. What principle is violated?

11. He tells the children that water is a liquid, and then shows what a liquid is. What principle is violated?

12. He gives a lesson on position and distance, always measuring and representing the object himself. What principle is violated?

13. He gives a lesson on the lion, before the children have had one on the cat. What principle is violated?

14. He gives a lesson on perching birds as an order, before any have been given on the robin, canary, and other individuals. What principle is violated?

15. The teacher, giving a lesson on a tiger, refers to the cat—lets one child talk of the cat at home, another of the dog, a third of the horse, a fourth of riding the horse to town. What principle is violated?

16. He undertakes to give lessons on the parts of speech to children who have had no lessons on objects. What principle is violated?

III.—Preparation of Sketches.

Too much stress cannot be laid on the importance of preparing notes or sketches in writing. It is not too much to say that no lesson ought to be given, a sketch of which has not been systematically prepared. In training students to this work it is found

desirable to begin with an examination and analysis of a few simple lessons.

First Example.—*Sketch on Water.*

(*See* "*Objects*," *Second Step.*)

Directions for Analysis.

1. Matter to be separated from method.
2. Point to be found, whether definitely stated, or contained in the title, or in the head.
3. Terms and information given to be distinguished from ideas developed.
4. Ideas developed, whether
   - (*a*) by addressing the senses directly.
   - (*b*) by comparison.
   - (*c*) by experiment.
   - (*d*) by addressing the reason.
5. Illustration—Use of Board—S. R.—Ellipses—Kind of Summary.

The analysis of the lesson on water as made by students should appear thus:

1. Matter. *See Summary.*
2. Point is contained in the heads, which are—
   - General qualities.
   - Uses, and special qualities on which uses depend.
3. Terms given—liquid and bright; information given—every country is well supplied with water.
4. Ideas developed:
   - (*a*) Water is bright—has neither taste nor smell.
   - (*b*) Water is a liquid—has no color—can be seen through.
   - (*c*) Water is useful for washing and drinking. (Memory.)
   - (*d*) Water is used for washing, on account of the absence of color and smell.
5. Illustrations—Ellipses and S. R.—Summary elliptical.

SECOND EXAMPLE.—*Lesson on Writing Paper.*

What is this? Paper. Whence do we get paper? Does it grow upon any plant? Does it come from off any animal? Do we dig it out of the ground? How do we get it then? It is made. Yes, it is made by man: but did man make it out of nothing? No; he must have something to make it from. Do you know of what paper is made? It is made of rags. Yes, the best paper is made of linen rags. Of what is linen made? Do you not know? It is made from the fibrous stem of a very pretty plant. Here is a picture of it; it is called *flax*. Repeat together, "Paper is made of rags; the finest paper is made of linen rags; linen is made from the fibrous stem of a plant called flax." Now, children, look at the paper, and tell me what you observe about it. It is white. This paper is white, but what is this? Blue. And this? Brown. What kind of paper is white? Writing paper. Try and find out why writing paper is made white. That we may see the writing upon it. Look at it and feel it. It is smooth. Put it between your thumb and finger. It is thin. Try again. It is light. Repeat together these qualities, "Writing paper is smooth, thin, and light." Now hold it toward the window. We can see through it. Can you see through it as well as you do through glass? What is the difference? We can see everything quite clearly through the glass; but through paper we only see the dim light. What did we say of glass? That it is transparent; but we say of objects through which we can see light only, that they are *translucent*. What can we say of paper? It is translucent. Try what you can do with paper. We can tear it. What more? We can bend it and fold it. Yes; on account of this quality it is said to be *pliable*. Repeat together, "Paper is *easily torn*: it can be easily bent and folded: it is *pliable*." See, I have put a part of this sheet of paper into the fire. It burns. It is *inflammable*. Why do we call paper inflammable? Because it burns readily. Tell me some other things that are inflammable. Wood, coal, &c. Of what use is this kind of paper? To write upon. Yes; and when you are grown up, and perhaps have to

live very far away from your father and mother and brothers, how pleasant you will think it to receive a sheet of paper folded up, and brought to you by the postman, to tell you how they all are, and how they are getting on! What is such folded-up sheet of paper called? Yes, a letter. How glad you will then be, that when you were young you went to *school*, and learnt to *read*, so that you can understand what is written in the *letter* brought by the *postman*.

After you have told me all you have found out about writing paper, and sung a hymn, I will tell you a true little history about writing. Now all repeat together, "Writing paper is made of *linen rags;* linen is made from the fibrous *stem* of a plant called *flax:* writing paper is *white, translucent,* and *pliable;* it is *smooth, thin, light,* and *easily torn;* it is *inflammable;* and it is useful to *write upon*."

After learning to spell any new words met with in the lesson, the children repeat the hymn—

"I thank the goodness and the grace," &c.

Now I will give you the little history I promised. It relates to one of those countries in which they worship idols of wood and stone, and where the people do not know God and Jesus Christ. The Lord put it into the heart of a very good man in England, Mr. Williams, to go over and teach these poor ignorant people how they might be saved and go to *heaven*. How do the Scriptures say that we can be saved? This good man had to cross the sea, in order to get at this *country*. How did he manage this? Yes; he went in a ship, and when he arrived at the country where the people did not know *God* and *Jesus Christ*, he began to teach them a great many things; he was very kind to them, and showed them how to build neat little cottages, and places where they might learn about *God;* and he made a ship that would sail upon the *water*. One day he was working very hard among them, when he found that he had left a tool at home of which he was in need; so he called one of the men, and taking up a chip of wood, wrote upon it the name of the tool he wanted, and desired the man to take it to his wife, and that she would give

him something to bring back with him. The man looked astonished, and waited for a message. "Go quickly," said Mr. Williams; "I am in haste; show this to my wife, that is all."

Now the poor man, though he was a great man in that country, knew nothing about reading or writing, and as he went he thought, How silly it is to take this piece of wood to show. However, he did as he was bid; he was *obedient*. How great was his surprise when he had given the chip to Mrs. Williams, to see her look at it and immediately fetch the instrument. "But how do you know," said he, "that this is what Mr. Williams sent me for?" "You brought me a chip of wood," said Mrs. Williams, "and that informed me what I was to give you; you have now only to go back quickly with it." He did so, saying to himself as he returned, What a wonderful people these Englishmen are; they can make even a chip of wood speak! Now, when this chief saw how much more than he or any of his people this kind missionary knew, he became willing that he should teach them about God and Jesus Christ.

You see, dear children, how much happier we are than these poor ignorant people. Who gave us our many blessings? God. Yes; He it is who made you happy my dear children. What should you do? Praise Him. Is it enough to praise Him with your lips? No. How, then, should you praise Him? We should praise Him with our hearts. Yes; but when you were singing that pretty little hymn of praise, I did not see you look as if you were really thanking God in your hearts. When a kind person has given you something, I have heard you thank them, and in such a manner, too, that I am sure you *felt* they had been kind to you. Now I should like to hear you thank God as if you indeed felt all that kindness which He is ever pouring out upon you.

The analysis of the lesson on writing paper, as made by the students in training, should appear thus:

1. *Matter of the lesson.* Paper is artificial. Writing paper is made of linen rags; linen is made of the stem of a plant called flax. Writing paper is white, translucent, thin, light; will tear easily; can be bent and folded; is inflammable; and is useful to write upon.

rubber (R. T.). Things that will not tear easily are tough (W.B.). See, I have put it into the fire; it frizzles. But when I put the paper into the fire it burns up with a flame. Think of other things that burn with a flame. Wood, rags. What is paper made from? Rags. And rags come from the flax plant. What does wood come from? Trees. Give me another name for plants and trees. Vegetables. Try and remember what I tell you. Solid things that burn with a flame come from vegetables (R. T.). But how does the parchment burn? It frizzles. Name other things that frizzle. Hair, a bone. What do bones come from? Animals. Hair? Animals. Parchment itself is the skin of an animal. What can you find out from all this? That things that frizzle come from animals (W. B.). What use can we make of this? It will do to write on. It is used to write on. Can you tell me why we use it, when we have plenty of paper? Shall I help you to find out? Which can you destroy more easily; which will last longer, paper or parchment? And why? Because it is tough. Now, if you were writing a note, which would be torn up after it was read, what would do to write your note upon? Paper. But when people want their writing to last for years and years, they write on parchment. The laws of the land are written on parchment. Now, if you answer well, I will tell you a story about this, after we have gone over what is written on the board (R. T.).

Once on a time there lived a queen in England, not like the present queen, who is kind and good to all. The former queen was ignorant, harsh, and cruel. There were good people in the country, who loved to read their Bibles and to learn; but there were wicked people, who tried to prevent them from doing this, and they and the queen made a law that whoever read the Bible and worshipped God, as we are told to do, should be burned to death. Now this queen had a servant who was a clever man. He knew that such a wicked, unjust law would not last: God would not let it. So they came to him about writing out this law, and said, Shall it be written out on parchment or on paper? He answered, "Take paper; for the poorest paper will last longer than the law." And so it proved; for the poor, mistaken queen died,

and then the people could read and pray in peace. There is a hymn about this, beginning—

I took the sacred Book of God,
To keep, to fear, to read it free;
But holy martyrs shed their blood
To win this word of life for me.

Now, what more have I to add to what is written on the board? The Uses of Parchment.

IV. Criticism Lessons.

Many of the lessons given by the students are called criticism lessons. They are given in the presence of the members of the class, who express opinions on the various points of the lesson; enumerating those in which they think the teacher has succeeded, and those in which they think she has failed. To conduct a criticism properly, it is necessary that there should be a presiding critic, whose opinion is final. The following are the points of criticism which are given as a guide to the class:

Points of Criticism.

I. *Matter.*

1. Whether suitable to children; whether exercising observation, conception, reason, or all these.

2. Lesson—whether bearing on one point; into what heads divided.

3. Whether, in a Scripture or moral lesson, an application be made; whether the right one. In a lesson on an animal, whether the children are led to see the wisdom and goodness of God in the adaptation of parts to mode of life, and whether humane feelings are cultivated.

II. *Method.*

1. Whether the teacher clearly apprehends the distinction between what must be told and what must be given.

2. Whether she distinguishes the various mental faculties one from another; knows which should be, and how exercised.

3. Whether good illustrations are used; the specimens large enough and sufficient for distribution; whether diagrams were drawn when required.

4. Whether appropriate questions were used when general answers are wanted. Leading questions only to obtain an admission, on which another question is based.

5. Whether the board was sufficiently used—new terms written on it; also titles and heads of lessons; also, with elder children, definitions and statements.

6. Summary, of what kind; whether of the kind most appropriate to the children and the lesson.

7. Whether proper use was made of "hands out" and S. R.

III. *Teacher.*

1. Whether capable of swaying the class according to her will and of awakening sympathy.

2. Whether attending to all, or carrying on the lesson with a few forward children; whether taking the right standing position.

3. Manner—whether appropriate—bustling and excited—slow and languid—cheerful and energetic; whether, if a Scriptural lesson, reverential tone of voice.

4. Language—whether appropriate; syntax and correct pronunciation.

IV. *Children.*

1. Whether respectful, attentive; whether interested; if so, to what interest is owing.

2. Whether likely to carry the lesson away as a whole; if a Scripture or moral lesson, whether their hearts were touched.

As a clear illustration of the design and method of conducting these lessons, we subjoin the following remarks and sketch, taken from a paper issued by the Home and Colonial Institution of London:—

Two principal objects are always kept in view in training teachers—the first, to make them acquainted with the principles

OBJECTS.

INTRODUCTORY REMARKS.

For many years the sentiment has been gaining ground in this country, that there is something to do in our schools beside simply teaching children to "read, write, and cipher." It is now very generally acknowledged that an acquaintance with Nature, in her varied forms, is also an important educational attainment, and that a knowledge of *things* does in its natural order precede a knowledge of *words*. As a result of this conviction, "Lessons on Objects" have been introduced into very many of the best schools of the country.

These lessons, however, have not always been given in a manner best calculated to awaken and cultivate the early faculties of children, and prepare them for the study of Nature.

These first exercises with children should be of a character calculated to quicken perception, and to cultivate close and accurate observation and expression. For the teacher to tell the child what she knows about objects, is only to burden the memory, discourage investigation, and weaken the perceptive faculties. The effort should rather be to lead the child to *discover for himself*, and then properly to *communicate the result of his observations*. It is with this idea prominently in view that the following sketches and series of lessons have been drawn up.

The truly successful teacher will rather use these as models, as conveying an idea of the general plan and method to be pursued, and will not confine herself either to the subjects or exact method here laid down. Too much importance, however, cannot be

attached to the teacher's having a definite plan and aim in each lesson. No teacher should ever go before her class without an exact sketch of the lesson she proposes to give. Without such preparation, the lesson had better never be given.

In the First Step, the Perceptive Faculty is exercised. In the earlier lessons the object is considered as a whole; in the later, as possessing parts—the recognition of these requiring more minute and accurate exercise of perception. In all the early steps, one important aim is the formation of a vocabulary.

In the Second Step, the Perceptive and also the Conceptive Faculties are exercised. In the earlier lessons the object is considered as possessing familiar qualities; in the later lessons, as possessing some important quality which other objects also possess.

In the Third Step, the exercise of the Perceptive Faculties serves as the basis of the lesson, the superstructure of which addresses the Conceptive, and especially the Reasoning Faculties. The object is considered in detail, all its parts noted, and all its qualities, except such as are altogether beyond the range of the children's experience. Especially do children consider the uses of the object, and the adaptation of structure, material, or qualities to these.

In this Step they often consider two objects at a time, comparing and contrasting them. A little information is often given; still it is not the aim of the teacher to tell them what they can learn from books, but rather to form correct and thorough habits of observation, and develop power of thought.

In the Fourth Step, the Faculty of Generalization is exercised, in addition to the other faculties before named. Objects are considered in classes: when a single object is taken, it is with reference to art, manufacture, &c.

FIRST STEP.

I.—Objects Named, Arranged, &c.

1. *Sketch of a Lesson on a Teapot, Milk Pitcher, Cup, and Saucer.*

1. The teacher should first ask the children if they have ever seen such things as these, when they usually see them, and what each of them is called.

2. The teacher calls upon a child to touch the teapot, asking the others if he has rightly done so. The same may be done with each of the objects.

3. The teacher herself touches one of the objects, and desires all the children who know its name to raise their hands; one child is afterward selected to apply the name. The same to be done with each of the objects.

4. The teacher to remove the objects out of sight, and then ask the children what things she has been showing them; this test should be repeated till they can correctly mention all the objects from memory.

5. The teacher may require a child to place the objects in a certain order; as the teapot in the middle, the milk pitcher before it, and the cup in the saucer behind it; the other children saying whether it is correctly done: they may then be desired to place all of them in a row. The teacher may then put the saucer upon the cup, and ask the children if that is its proper place, and then call a child to place it as it ought to be, and also to *say* what are the proper positions of the cup and of the saucer.

6. The teacher, having arranged the objects in a certain order, desiring the children to observe how they are placed, is to remove them, and call upon some child to replace them in the same order; they may then be placed differently, and the same test be applied.

7. The lesson to conclude with a little talk about the objects—their number and names; their uses; what is put into the teapot, what comes out of it; what is put into the milk pitcher; how the cup is used, &c.

Supposing this book to be used by the Educational Teacher,

or Teacher of Method, in the instruction of a class of students, it is of the utmost importance that they should be exercised in drawing up sketches corresponding with the patterns given.

After examination of the above sketch, the students in training should construct a similar lesson, on plate, knife, fork, spoon, and glass.

2. *Sketch of a Lesson on a Basket, a Book, and a Slate.*

1. See that the children know these objects and their names, and can themselves apply the proper name to each object.

2. Remove the basket, book, and slate, one by one, and after each has been taken away, call upon the children to say which it is; then take all three away, and let them say what the three things which have been taken away are, and how they were placed before they were removed.

3. Call upon some of the children to place the several objects as directed, thus: the basket in the middle, the books nearer to the window, and the slate on the opposite side. Tell them to observe how they are placed, and then, removing them, desire one of the children again to place them as they were.

4. Next talk about the uses of these objects. How are baskets used, and by whom? For what purposes do the children themselves use them? What have they seen their mothers do with them? Place some books in a basket in a neat and orderly manner, and then desire a child to do the same with others; this will teach them to do such things neatly and tidily. Then ask them what people do with books. Read a line or two in a book, and ask what has been done, and if they would like to be able thus to read. Then talk about the slate, by whom they have seen slates used, and for what purposes.

5. Sum up the lesson by asking how many things have been spoken of, their names, and the ordinary use of each of them.

The students in training construct a corresponding lesson on shovel, poker, and tongs.

Their attention should be drawn to the *general* plan of these lessons, thus:

PLAN.

1. Teacher presents the objects; ascertains which the children can name; gives names they do not know, always touching the object named, requiring children to observe it, and causing the names to be *simultaneously repeated.*

2. Teacher exercises the children on the names, by pointing to the objects, and letting the children name them; then by naming the objects, and letting the children touch or bring them.

The last part of the lesson will vary according to the objects selected. If these are plate, knife, fork, &c., the teacher will direct attention especially to the arrangement of the objects—where they would place the plate, if they were going to set the table? where the knife? where the fork? Tongs, poker, &c., candle, candlestick, &c., would be treated similarly; and the arrangement of bonnet, scarf, &c., as parts of dress, show.

In the lesson, "Wood, Hatchet, Hammer, &c.," the use of the tools, rather than any arrangement of them, would be exhibited. Terms for prominent parts, as handle, rim, lid, should be given as the parts are noticed by the children.

LIST OF SUBJECTS FOR SIMILAR LESSONS.

Plate, knife, fork, spoon, glass.
Tongs, poker, shovel, hearth brush.
Candle, candlestick, extinguisher, tray, snuffers.
Bonnet, veil, scarf, gloves, parasol.
Needle, thimble, thread, calico, scissors.
Pen, ink, paper, blotting book, pen wiper.
Penknife, pencil, ruler, India rubber.
Wood, hatchet, hammer, gimlet, nail.
Clay, stone, sponge, wool, string.

II.—Objects for Parts.

Including the consideration of—

1. Names and Number of Parts.
2. Position of Parts.

3. Uses of Parts.
4. Principal, distinguished from Secondary Parts.

Any one or two of these points may be taken up in a lesson, which one or two will generally depend on the subject.

1. *Sketch on a Thimble, for Parts.* (*Pattern Lesson.*)

Uses of parts.
Names of parts.

MATTER.	METHOD.
I.—A thimble has a crown, a shield, cells, a border, and a rim.	I.—Teacher presents a thimble. Selects a child to touch a part. Asks the children to name it, and when they fail, gives name, which is simultaneously repeated (S. R.) by the children, and written on the board (W. B.). Teacher selects second child to touch a second part, and proceeds as before, until all the parts are distinguished and named. Children read the names from the board. Teacher erases these, and children give them again in order from the top to the bottom of the thimble.
II.—1. The crown, so called because it is the top part of the thimble.	II.—1. Teacher exercises the children on the appropriateness of the names. Child to touch the crown. Why the upper part is so called. What crowns are. Where they are worn. A part of the head is called the crown. Teacher bids a child touch crown, and then touch some higher part. Why he cannot comply with the latter command. The *top* part of the head is called the crown, and a part of the thimble is called the crown, because it is *the top part.*
2. The shield is so called because it keeps the finger from being hurt.	2. A child to touch the shield. Teacher shows the picture of a soldier with a sword and shield. Children state use of the sword—of the shield, and why this part of the thimble is so called.
3. The cells are so	3. Child to touch the cells; show

called because they resemble the cells of the honeycomb.

4. The border is so called because it is an ornament near the edge.

honeycomb and its cells. Children say why the holes in the thimble are called cells also.

4. A child to touch the border. Its position referred to (near the edge). Children mention any borders they have seen on any objects, as on handkerchiefs, shawls, &c. Where these are placed. Why people have borders. Why this part of the thimble is so called.

5. A child to touch the only remaining part—the rim—and give examples of rims on other objects.

NOTE.—Nothing is said about the inside, outside, &c., as distinct parts. It is undesirable to mix up the consideration of geometrical with that of material parts; it tends to confuse the children.

Students in training construct a sketch on "Penknife," as "Thimble."

The Teacher of Method might next require the class of students to work out exercises on an apple, thus:—

Find the matter under the heads.
Parts found and named.
Position of parts described.

2. *Example of Sketch on an Apple.*

MATTER.—I. Parts of an apple.

The parts of the apple are pulp, core, seeds, peel, eye, dimple, and stem.

II.—Position of parts.

The peel covers the apple.
The pulp is inside the pee
The core is in the centre of the apple or pulp.
The seeds are enclosed in the core.
The dimple is at the base of the apple.
The stem is at the base, and partly within the dimple.
The eye is at the top of the apple.

The teacher of Method next requires the class in training to find the method corresponding.

Exercise.

METHOD.—I. 1. Show an apple. Get the name, and after a little talk about the use, where it grows, &c., desire a child to touch a part—(the skin). Give the term *peel.* Children to say what part of the apple they like best. How we are to get at this. Whether, before this is done, they can find any other part by looking at the outside—(the speck or bud). Give the term *eye.*—(The little hole.) Tell them there is a better name—*dimple.* The little dent in the apple is also called dimple. What part is near the dimple? (Stem.) Children name all the outside parts of the apple. (W. B. S. R.)

2. Children allowed to name all the inside parts. Apple cut and examined, to prove whether they are right. (W. B. S. R.)

II.—Bring out the position of the peel, by asking why they could not see the pulp of the apple before we cut it open.

Position of pulp, core, and seeds brought out by direct questions. Children led to express themselves properly, and S. R. Idea of base developed by making the children ascertain on what part the apple will stand best. If necessary, remove the stem. Let them find the parts near the base. (The dimple and the stem.) Only one part left—where is it? Not at the base, but at the other end of the apple. Give the expression, *opposite the base.*

Summary.—Teacher names the position by requiring children to fill up the ellipses by naming the parts, thus: Outside the pulp is ———. Under the peel is ———. In the midst of the pulp is ———. Within the core are ———. At the base is the ———. Partly within the dimple, and at the base, is the ———. Opposite the base is the ———.

The students in training construct a lesson on the "Penknife," after the model of the lesson on the "Apple."

3. *Sketch of a Lesson on a Shell.* (*Pattern.*)

For Names of Parts.
Principal, distinguished from Secondary Parts.
Position of Parts.

I.—Parts.

1. *Introductory.*—Object named, where found, and of what use.

2. Parts distinguished and named. Teacher directs the children to find the largest part of the shell. Excites interest by telling them that they can find out the name of this part. What they call the largest part of themselves. (The *body*.) (S. R.): "The largest part of the shell is called the body." The part of shell next in size pointed out. Children told they can find a name for this also; they must not, however, look at themselves for the name, but at the buildings out of doors. Set the shell on its base, and ask, What part of any building goes up like this? The spire of a church. (S. R.): "The next largest part of the shell is called the *spire*." Terms *body* and *spire* written on the blackboard.

II.—1. Children have next to find the parts of the body—mouth, lips, beak. Teacher gives the names, writes them on the board, and requires the children to say why these names are given.

2. Next, children find the parts of the spire—*whorls*, *sutures*, and *apex*. Teacher gives the first and second terms. (S. R.) With respect to the third term, if they have had lessons on Form, she bids them select a solid that has a part like this part of the shell, telling them that the same name is given to each. They read what is written on the board, which appears thus:—

Body,	Mouth, Lips, Beak.	Spire,	Whorls, Sutures, Apex.

III.—Position of Parts.

Children led to describe the position of principal parts with respect to each other, and the position of secondary parts with respect to principal, or to each other, as may be most convenient, thus:—The spire is at one end of the body; the mouth is in the under part of the body; lips around the mouth; beak proceeds from the mouth, and is at the end of the body opposite the spire. Whorls surround the spire; sutures are between the whorls; apex is at the end of the spire.

If time allow, these questions should be varied, as, Where are the whorls with respect to the apex and the body? or this may be done in recapitulation next day.

Summary.—Parts given from memory. Position given from memory, if children are quite advanced, and about ready to enter the next Step.

Students in training are required to construct a lesson on the "Penknife," after the model of the "Lesson on a Shell."

Students in training write a sketch on "Bunch of Grapes," according to the following heads and directions written on the blackboard:—

4. *A Bunch of Grapes.*

1. Parts found and named. (Lead children to distinguish the principal parts first, then the secondary.)

2. Position of Parts. (Of the principal parts with respect to each other. Next take the secondary parts of the stem; next of the berry.)

While considering the position of the principal parts with respect to each other, develop the idea of "cluster."

PLAN.

Children must discover the parts for themselves, and at first may do so in any order, teacher putting them down in the order of discovery. She rearranges them in proper order, according to direction of children, either at once or at the close of the lesson. See "Sketch on the Thimble."

It is important that children should be accustomed to recognize that there is an order; that "any way" will not do.

When the ideas of principal and secondary parts have been developed, children may be told to find the secondary parts of one principal part first, then the secondary part of another principal part, putting them down as found. This saves time. See "Sketch on Shell."

Children should be encouraged to give any names of parts they know, teacher supplying the rest when arbitrary; but, when

the name is suggested by any circumstance or quality not beyond the knowledge of the children, it will be well to help them discover the name. Or she may give the name, and let the children say why given.

EXAMPLES OF NAMES WHICH MAY BE FOUND BY CHILDREN.

Bluebell.	Body, spire, and beak (of a shell).
Handle.	Dimple (of an apple).
Bowl (of a spoon).	Ribs (of an umbrella).

Use of parts should be shown by children whenever possible. Position and uses not usually written on the board.

LIST OF SUBJECTS FOR PARTS.

Watch.	Table.	Spade.
Wheel.	Chair.	Fruit.
Shoe.	Pail.	Articles of jewelry.
Carpenter's tools.		Kitchen utensils.

(Refer also to list on page 90.)

SECOND STEP.

In this Step the children are led to distinguish between the object and its qualities.

I.—An object is distinguished by its most simple and familiar qualities.

II.—The idea of one essential and distinctive quality is systematically developed.

I. Simple and Common Qualities of Objects.

As an example of a lesson on an object distinguished by its most simple and common qualities, take—

1. *Water.* (*Pattern.*)

What is in this cup? Water. (*Teacher pours a little on a piece of paper, or of linen.*) What has the water done to the paper? Made it wet. Now observe me. (*Teacher pours it out in drops.*) What do you observe, now that I pour it out little by little? It forms itself into drops. Tell me, then, how the water is unlike the flint. The flint does not make the paper wet. It does not form itself into drops. What, then, can you say of water? Water is a liquid. Tell me some other liquids. Beer, milk, &c. Anything you can pour out so as to form it into drops, is called a *liquid.* Now look into the cup of water; what do you see? We see a mark at the bottom of the cup. Here is another cup with the same mark at the bottom; look at it. (*The teacher pours in a little milk.*) Look at the mark again. We cannot see it now. Why not? You have covered it with milk. But the mark in this cup is covered by water, and yet you see it; how is this? We can see through the water. What, then, can you say of water? We can see through water. Find some other thing in the room that you can see through. The glass. Look at the water again, and find out something more that you can say of it. It shines. Yes; it is *bright.* All of you repeat, "Water is bright." What color is the flint? Black. What can you say of the water? Look at these colors (*showing a red wafer, green leaf, &c.*). Which of these is the water like in color? None of them, teacher. What, then, must we say of it? Water has no color. (*The teacher calls upon some of the children to taste the water.*) What do you observe? It is cold. What taste do you perceive?—you cannot tell me. Has it any taste? No. What, then, can you say of it? It has no taste. Repeat together, "Water has no taste."

What use have you made of water to-day? We have washed ourselves with it. What quality of water makes it useful for washing? Its being liquid. Beer is also a liquid; why do you not wash in beer? We should smell the beer. Then why do you prefer water for washing? It has no smell. What other objection is there against washing in beer? It would not make us clean; it would leave a brown stain. Why, then, is water a proper liquid to use for washing? Because it has neither smell nor color, and it cleanses from dirt. When are you very glad to be able to have water? When we are thirsty. Tell me, then,

another use of water. It is useful for drinking. Water, you see, is essential to every one; can you tell me some liquids that we might do without? Yes; beer and gin. But what can we say of water?* What can we most easily procure? Water. Yes; and as every one needs water, God has kindly supplied every country with it in abundance.

Repeat together what you have found out about water. "Water is a liquid; we can see through it; it is bright; it has no color, nor any taste, nor any smell; it is cold; it is used for washing and for drinking; and because water is necessary to man, God has given to every country an abundant supply."†

The students in training construct a lesson on "Milk," modelled after the "Lesson on Water."

2. *Lead.*

What is this? Lead. Can any of you tell me where lead comes from? Does it come from an animal? Is it part of a plant? Where, then, does it come from? It comes out of the earth. God has not only given us animals and vegetables to be useful to us, but he has stored up in the earth a great many things for our use: tell me one of them. Lead. Now take this lead into your hand; what do you find? It is heavy. Look at it, and tell me what you see. Part of it is very bright, where it has just been cut. And what is it everywhere else? Dull. When is it bright? When it has been freshly cut. When is it dull? When it has been some time in the air. Of what color is it? It is gray. Now feel it. It is hard. John may come and cut it with his knife. Now what can you say of it? It is hard to the touch, but it is easily cut. I put some of it into water; what happened to the lead when I put it into the water? It fell to the bottom. Would the feather have done so? No. Why did the lead sink?

* The teacher might remark upon the goodness of God in abundantly supplying every one everywhere with that liquid which is essential to comfort; whilst the noxious spirit is obtained by art and labor, and at great cost.

† It is most desirable that children should be early taught to write, or print; and printing on their slates all they can recollect of their lessons, forms a most improving exercise. In mixed schools this would furnish employment to one set of children while the teacher is engaged with another.

Because it is heavy. Did you know it was heavy before you saw it sink? Yes; we felt it heavy in our hands.

Is there any child here whose father works in lead? Yes;* John's father works in lead. What is he called? A plumber. People who work in lead are called plumbers. Well, John, tell us what your father does with lead. He makes windows. What sort of windows—those like the windows of this school room? No; windows made with little bits of glass. Where do you generally see such windows—in large houses, or in small ones? What is the use of the lead in windows such as these? It fastens the pieces of glass together. What have our windows for this purpose? Wood. And what is used to fasten the glass to the wood? Putty. But in church windows, what is sometimes used? Lead. Yes; lead is used to fasten the glass together. Now, John, what other use does your father make of lead? He makes pipes. All who can tell me what is the use of leaden pipes, hold up their hands. To convey water. Yes; to convey water from one place to another. Who can tell me any other use of lead? It is used for cisterns. What is the use of cisterns? They hold water. What use do fishermen make of lead? They put it on their nets. Why? To make one edge of the net sink in the water. Why does the lead make that part of the net sink? Because it is very heavy.

Well, now repeat all you have said about lead. "Lead comes out of the earth; when it is freshly cut it is very bright; but after it has been in the air for some time, it becomes dull; it is very heavy; its color is gray; it is hard to the touch, but it is easily cut; when put into water, it sinks; people who work in lead are called plumbers; they use it to fasten together the glass of church windows; to make pipes to convey water, and cisterns of lead to hold it. Lead is also used in fishermen's nets."

The students in training construct a lesson on "Wood," modelled after the one on "Lead."

Attention of students should be directed to the general plan

* It may be that the child of a plumber is present at the lesson; it must occasionally happen that some have seen the materials brought before them at school, used by their parents or others. A teacher should always make the most of any information the children may already possess.

of these lessons. The children are led to notice first the qualities, then the uses, and lastly those qualities on which the uses depend.

LIST OF OBJECTS.

This it is unnecessary to give, as any common objects will do.

LIST OF QUALITIES TO BE DEVELOPED AT THIS STEP.

Simple qualities referring to Substance; as, hard, soft, tough, brittle, liquid, &c.
" " Surface; as, rough, smooth, plane, flat.
" " Condition; as, hot, cold, cool, warm, dry, moist, full, empty.
" " Shape; as, tapering, pointed, rounded, jagged, broken, torn, &c.
" " Direction; as, straight, curved, crooked. See "Lessons on Form."
" " Size; as, large, small, thin, thick, deep, shallow, etc.
" " Color; as, red, blue, green. See "Lessons on Color."
" " Number; as, one, two, &c., up to ten.

After a course of these lessons, the children, being made acquainted with common objects and their common qualities, may receive a few recapitulatory lessons on several of these in combination.

EXAMPLE.

3. *Sketch of a Lesson on "Distinguishing Objects by their Qualities."*

I. *Introduction.*—Bring before the children a large, round, ripe apple—a sheet of thin, smooth, pink paper—a slender, pointed cedar pencil—a piece of narrow, blue silk ribbon—an oblong, shallow wooden box—a square, white linen pocket handkerchief. Let the children give the name of each object, teacher writing the initial letter of each on the board as given, and requiring children to say what each letter stands for.

II. *Ideas Developed.*—Teacher requires the children to say something of the apple as to size (large); as to shape (round); as to fitness for food (ripe). How other apples may be unlike this. What we can say of this apple. (It is a large, round, ripe apple.) Children to describe the paper as to texture (thin); as to surface (smooth); as to color (pink). Other papers mentioned unlike this—tissue, brown, &c. How we can describe this sheet of paper. (It is a sheet of thin, smooth, pink paper.) Children to describe the pencil. Compare with thicker pencil; as to girth (slender). Compare with uncut pencil; as to condition (pointed). Of what material is it made? (Wood and lead.) Tell them the wood is called cedar.

Proceed in this way with the remaining objects.

Summary.—Children to name the objects from the board, and describe them from memory.

Students in training select six objects, upon which they construct a similar sketch.

II. Essential and Distinctive Qualities of Objects.

For the idea of one essential and distinctive quality systematically developed, take—

1. *Sketch on the Development of the Idea of Adhesive Gum, for Adhesive.*

MATTER.	METHOD.
1. Gum will stick.	1. Show this by experiment with postage stamp.
2. Gum is therefore said to be adhesive.	2. Term given. Questioned on. S. R. and W. B.
3. Glue, melted sealing wax, and molasses, are also adhesive.	3. Such examples found by the children.
4. Those things that will stick to other objects, are said to be adhesive.	4. Children led to draw this general conclusion, which is committed to memory.

Students in training construct a sketch on "Idea of Inflammable," modelled after the one on "Adhesive."

Toward the close of this Step, two or three qualities connected, or contrasted, may be taken together.

EXAMPLE.

2. *Idea of Transparent, Semi-transparent, and Translucent.*

1. Bring before the children a piece of glass and a key. Hold the key behind a slate, also behind the piece of glass, and require them to notice the difference. What they can say of the glass, that they cannot say of the slate. Give the term that distinguishes things we can see through, and let the children repeat, "Glass, because we can see through it, is said to be *transparent*." Require them to give examples of things they can see through, as well as through glass; also what such things are said to be.

2. Place a knife with a white handle in some tea, and again behind the glass. What the glass shows about the knife, which the tea does not (the color). Lead them to recognize that they can clearly see through the glass, but only partly through the tea. Refer again to the term which distinguishes things through which we can clearly see, and let them try to find a term for anything through which we can partly see. Give the term, thus: Tea, because we can see partly through it, is said to be *semi-transparent*. Explain the meaning of *semi*. Get examples of both terms, to be written on the board.

3. Place the knife behind a china plate. Children to say how it looks. (They cannot see it at all.) Hold the plate, with the knife behind it, opposite the window; the shape of the knife can be seen. Explain to the children that the light can pass through the plate, except where the knife stops its passage. What they can say of the knife. (It is opaque—idea previously developed.) What they can say of the plate. We can see light through it. Give the term *translucent*, with definition. Get examples, and write on the board as before.

Summary.—Children say how well they can see through anything transparent (clearly). What they cannot see through anything which is semi-transparent (color). What only they can see through anything which is translucent (form). In conclusion, give the general definition of each term.

Students construct sketch on three kinds of Roundness (Globular, Cylindrical, and Circular), as sketch on "Transparent," &c.

As a final exercise, the children may be tested in discovering objects by the mention of their qualities. Teacher says: I have something hidden in my hand (a blade of grass). It is long; it is narrow; it is pointed at one end; it is flexible; fibrous; vegetable; green. Speaking thus, the teacher pauses between each term, allowing the children to judge as she proceeds, and making them name the quality which led to the discovery of the object. Sealing wax:—It is long; it is smooth; it is colored; it is inflammable; fusible; impressible. Drinking glass:—It is bright; it is hard; smooth; sonorous; hollow, and transparent. Judgment must be shown in putting the more general qualities first, and the more special afterward.

LIST FOR DEVELOPING IDEAS AS TO THE QUALITIES OF OBJECTS.

Paper, as being	Inflammable.
Leather	Tough.
Glass	Brittle.
Cotton	Soft.
Cork	Light.
Card or Cane, String	Flexible.
Cloth	Pliable.
Whalebone, India rubber, Sponge	Elastic.
Water	Liquid.
Wood	Solid.
Loaf Sugar	Sparkling.
A Mirror, or Water,	Reflective.
Sponge	Absorbent.
Bread	Porous.
Chalk	Crumbling.
Flax and Hemp	Fibrous.
Gum	Soluble.
Lead	Fusible.

Oil-skin	Water-proof.
Leather	Durable.
Sealing-wax	Impressible.
Glue	Adhesive.
Camphor	Odorous.
Lavender	Fragrant.
Horn or Gum	Semi-transparent.
Cloves	Acid.
Water	Tasteless.
Ginger	Pungent.
Salt or Sand	Granular.

LIST OF CONNECTED OR CONTRASTED QUALITIES, FOR RECAPITULATION.

1. Soft, hard, tough.
2. Light, heavy, buoyant.
3. Rough, smooth, polished, adhesive.
4. Stiff, pliable, flexible, elastic.
5. Brittle, rotten, fragile, friable, pulverable.
6. Fibrous, granulous.
7. Inflammable, fusible, soluble.
8. Porous, absorbent, waterproof.

THIRD STEP.

In this Step a more thorough examination of the object is made. We consider —

Parts, Qualities, Uses.
Adaptation of Qualities to Use.
Qualities as discovered by the senses, or by *simple* experiment.
The less obvious Qualities.
Qualities as depending on one another.
Adaptation of Material or Structure to Use.

Sometimes two objects are taken for comparison in respect to any of these points.

In this Step, as the subjects of the lessons go beyond the range of the child's immediate experience, some information may be given. Let it be remembered, however, that the mind of the child may be exercised as much on information given him by the teacher, as on anything he can discover for himself. The teacher who tells the child a fact, requires him to state the cause, or the effect, or some other relation. For everything told to the pupil, the latter should be required in return to tell something bearing on what has been told to him. Tell him that a substance cast into the form of a hollow cylinder is stronger than the same quantity of matter in a solid form; let him say why the barrel of a quill is hollow, and not solid. Tell him what places the kingfisher frequents, and let him infer the character of its food. Tell him that the fur of animals thickens at a certain period of the year; let him discover when and why. Tell him that the concentric circles in the trunk of a tree are not equal in diameter; let him find any circumstances likely to account for the fact.

1. *Sketch of a Lesson on an Egg.*

Point.—Parts, qualities, uses, and qualities on which the uses depend.

MATTER.	METHOD.
I. *Parts.*—The parts of an egg are the shell, lining, albumen, envelope, air bag, and yelk.	I. *Parts.*—Show an egg, and let the children name its parts. Break the egg, and show each part, correcting any errors they have made. Let the children observe how these parts are placed with respect to each other: *i. e.*, the shell is outside, the lining is inside the shell, &c. Write the parts, and their position, on the board. Draw the term *lining* from the children. Give the terms *albumen*, *air bag*, *envelope*.
II. *Qualities.*—The shell is oval, white,	II. *Qualities.*—Develop *oval*, by comparing the egg with a sphere. Develop

cal, wholesome, and pleasant to the taste.

2. Parts. Both have seeds in the midst, peel, and pulp.

II. *Differences.*

1. Pulp. The pulp of an orange is yellow, divided, and without a core. The pulp of an apple is white, undivided, and contains a core. It is harder than the pulp of an orange.

2. Peel. Orange peel is thick, somewhat rough, and orange color. Apple peel is thin, smooth, and varies in color.

III. *Uses, and qualities on which uses depend.*

1. Apples are made into sauce, tarts, cider, &c. Are best when cooked.

2. Oranges make candy, marmalade, wine. Are best uncooked. Each eaten because pleasant to the taste, and wholesome.

IV. *Growth, cultivation, &c.*

1. Apples are grown in moderately warm

Vegetable, by referring to the different kingdoms. *Juicy*, by experiment (cutting fruit). *Spherical*, by comparison with a coin or ring. *Wholesome*, by reference to a horse chestnut; distinguished from nourishing, by comparison with an egg. *Pleasant to the taste*, by experiment, or an appeal to memory. (W. B.)

2. Children find out the corresponding parts, and the position of each, by observation.

II. *Differences* in the arrangement, substance, color, and in presence and absence of core, brought out by observation.

III. Appeal to experience and reason of children.

IV.

1. Teacher refers to map, and points out States where apples grow. Children de-

hard, translucent, and brittle. The lining is translucent, white, thin, and tough. The albumen is semi-transparent, adhesive, and semi-fluid. The yelk is yellow, opaque, and fluid.

III. *Uses, and qualities on which uses depend.*—Eggs are used as food for man, and then must be lightly cooked, or we should not readily digest them. As food for young birds, they must be boiled hard like leather.

Eggs are put into cakes and puddings, because adhesive and light. The albumen is used to mend china and glass, because adhesive. The shells are good for fowls to mix with their food.

hardness, by comparing it with an orange. *Brittle*, by referring to the experiment of breaking the egg just performed. Develop *translucent*, *semi-transparent*, and *opaque* together, by comparing the different parts of the egg one with another, but apply the terms separately to the proper substances. Develop *semi-fluid*, by comparison of a solid and a fluid. Write the qualities on the board.

III.—Draw from the children, by questions, the uses of eggs, and the qualities on which the uses depend. By comparison of eggs as prepared for our food, and for that of little birds, lead them to see that birds must have a much stronger digestion than we. From the use made of the albumen, let them say what quality it must possess. This will prepare them for the next question—why we put eggs into puddings? We need not make a thick, heavy paste of flour: a little flour will do, or even crumbled bread, when we have enough eggs.

Summary.—Read from the board, and repeated from memory.

Students in training construct a sketch of a "Lesson on a Peach," modelled after the "Lesson on an Egg."

2. *Sketch on Comparison of Orange and Apple.*

Point.—Parts, qualities, uses, and qualities on which uses depend.

MATTER.	METHOD.
I. *Resemblances.*	I. *Resemblances.*
1. Qualities. Both are natural, vegetable, juicy, (nearly) spheri-	1. That these fruits are *natural*, is brought out by reference to the works of God and man, children giving examples.

climates. A plantation of apples is called an orchard.

2. Oranges grow in hot climates. A plantation of oranges is called an orangery.

cide as to the kind of climate that is necessary for their growth.

2. Proceed the same for oranges.

Summary.—Write heads on the slate. Children give matter.

Third head left out, because not essential to be committed to memory.

Students in training construct a sketch of a "Lesson on Kid Glove and Kid Slipper," modelled after the "Lesson on Orange and Apple."

3. *Sketch on Comparison of Cork and Sponge.*

Point.—Quality on which uses depend, and dependence of one quality on another.

MATTER.	METHOD.
I.—1. Cork is natural.	I.—1. Brought out by reference to the works of man.
2. Cork is vegetable.	2. Children asked where it comes from. Told that it is the bark of a tree.
3. Cork is foreign.	3. Children told that the tree grows in distant countries.
4. Cork is light.	4. Children referred to water as the standard weight. The lightness of cork shown by experiment.
5. Cork is brown.	5. Show different specimens, and let children name the color.
6. Cork is compressible and elastic.	6. By experiment.
7. Cork is porous.	7. By direct observation with a magnifying glass, and comparison with dense substances, as minerals.
8. Cork is impervious and buoyant.	8. By experiment.

II. Sponge is a natural animal substance, light, brown, compressible, elastic, porous, and absorbent.

II. For *animal*, children asked where we find sponge? What it is, and a little of the natural history given. Mention the term *marine*. Children give other examples of marine substances, as coral, &c. Children required to mention qualities of sponge, the same as those possessed by cork.

III. *Qualities dependent one on another.*

1. Cork is buoyant, not merely because it is light, but because it is impervious. Cork is impervious because its pores are small, and but little connected.

2. Sponge is absorbent, because its pores are large and connected.

III.

1. Children led to discover the buoyancy of cork. They decide whether light or heavy things float on water, and, by experiment, which is the lighter—cork or sponge. Yet, as they perceive, the sponge soon sinks, while the cork still floats. Why this is?

2. Cut the sponge, to show the communication between the external openings and the central channels. Children say what must happen if we put such a structure under water, and why. Try the experiment.

IV. *Uses, and qualities on which uses depend.*

1. Cork is used for life boats, cork legs and arms, because buoyant and light; for soles of shoes, because impervious; for stoppers of bottles, because impervious, elastic, and compressible.

2. Sponge is useful for washing, because absorbent, compressible, elastic, light, tough, and durable.

IV.

1. Brought out by referring to previous knowledge (teacher giving any needful information as to uses). In bringing out the qualities on which uses depend, the reason is appealed to.

2. Brought out by getting children to describe the effect of the process of washing, on the sponge. It receives water, because it is absorbent; it discharges the water when used, because it is compressible; it resumes its former shape, and becomes fit for use as before, because it is elastic; it is easily lifted and moved, because it is light; it lasts for a long time in constant use, and is not worn away, because it is tough and durable.

Summary.—Children arrange and classify the "Matter" under "Resemblances and Differences of Cork and Sponge," as:

RESEMBLANCES.	DIFFERENCES.
Both are natural, foreign, light, brown, porous, compressible, and elastic.	Cork is a vegetable substance. Sponge is an animal substance. Cork is impervious. Sponge is absorbent. Cork is buoyant, because light and impervious; impervious, because its pores are small and not connected. Sponge, though lighter than cork, is not buoyant, because absorbent; and absorbent, because the pores are large and connected.

Students in training construct a sketch on "Comparison of Salt and Sugar," like the one on "Cork and Sponge."

4. *Sketch of a Lesson on Water.*

Points.—Qualities on which uses depend. Less obvious qualities.

MATTER.	METHOD.
1. Water is tasteless and refreshing; therefore useful to drink.	1. Children say why they like to drink water in summer. Whether there is anything they like better to drink. Whether they would like to drink cider or tea only whenever they were thirsty, and at every meal. (They would get tired of it.) Why they cannot get tired of water. Effect of drinking water when very thirsty.
2. Water is a solvent, without smell or color; therefore useful for washing, for fertilizing the ground, and for dissolving various substances.	2. *Experiment.*—Put a little sugar into water. Children say what the water does. Are told what water is. Find other things of which water is a solvent. Refer to water as nourishing plants, and explain that it does so by dissolving substances in the ground which are their food. Refer to use of water in washing. As beer is a solvent, lead children to find why it would not do to wash in that.
3. Water is reflective, which makes it a beautiful object in a landscape.	3. *Experiment.*—Water will serve as a mirror. Children find what does better than water, and why. Refer to the condition of people before mirrors were invented. Objects commonly mirrored in water. Effect of this reflection on the scene.
4. Water takes the shape of the vessel that holds it.	4. *Experiment* with—1, plate; 2, basin; 3, vial. Children describe these as to extent—1, wide and shallow; 2, not so wide, but deeper; 3, narrow across, but deeper. Fill each with water, and measure in different directions, showing how the extent of the water corresponds with that of the vessel. Children called on to say what will happen if the contents of the vessels be exchanged.
5. Water exists in different states—sometimes as a liquid, sometimes as a solid, and sometimes as a vapor.	5. *Experiment.*—Refer to the idea of liquid. Refer to a little girl who went for water on a very cold day. She found only ice. How this differed from liquid water. She put the solid ice into the kettle—put the kettle on the fire. Second change water underwent (vapor). Children to say where they expect to find much ice, and why the earth is often so dry in very hot countries.
6. Water is found in different places—in the clouds overhead, in the caves of the earth, underneath and on the surface of the ground.	6. By reference to the uses of water, and the sufferings caused by the scarcity of it, show the goodness of God in supplying it abundantly. Children say where it is to be found. Refer to where the vapor went, and tell them the clouds are made of this vapor. Thus some water is always floating in the air, whence it falls in rain. Some in hollow places in the earth; hence it gushes out in springs, and there is generally plenty on the surface of the ground, that we may get it easily.

As each point is worked out, let children form a sentence, which write on the board as found in "Matter."

For summary, read matter from the board, and rewrite from memory.

Students in training construct a sketch of a Lesson on "Mercury," or "Air," modelled after the "Lesson on Water."

5. *Sketch of a Lesson on Loaf Sugar.*

Points.—Qualities as discovered by the senses. Less obvious qualities.

MATTER.	METHOD.
1. Sugar is white, sparkling, opaque.	1. Present a piece of loaf sugar, and ask the children to give the name, and tell what they can discover by looking at it. Compare it with a piece of crystal. Points of difference—one translucent, the other opaque. Points of resemblance—hard, white, bright. Compare the brightness of both objects—one is bright all over, the other full of little bright points. A thing clear, bright all over, is said to be *lucid*. A thing full of little bright points, is said to be *sparkling*. Children name other objects that sparkle, and find by comparison that things that sparkle have usually a rough surface.
2. Sugar is rough and hard.	2. Bring out *rough* and *hard*, by asking children what they can say after feeling of it.
3. Sugar is sweet.	3. By taste.
4. Sugar is fusible, brittle, granulous, and crystallized.	4. Bring out *fusible*, *soluble*, *brittle*, and *granulous*, by direct observation and experiment. *Crystallized* developed by putting threads into strong solutions of salt or alum, which, after a few hours, will be covered with crystals. (*a*) Children compare the grains with each other, and find that they are all of the same shape. (*b*) Children notice that they are solid, by reference to the broken grains. Whether they find anything inside? (*c*) Produce some of the simplest solids, and some amorphous stones. Which do the grains most resemble? Why? Because they are all of the same shape. Show one part of a solid concealing the other part. What children expect to find on the other side—corresponding faces and edges. Will know that crystals are alike. Give the term *regular*. Tell children that substances formed in little grains, all of which are regular solids, are said to be crystallized. Refer to sugar as juice of a plant. Children state the origin and original form of sugar (liquid). Produce various specimens of crystals, and after drawing attention to them as such (being regular), tell them that every one of these was once a liquid, and has now become a regular solid. Examples found by children of a liquid that crystallizes (snow). Might be followed by lesson on the forms, into which many objects crystallize.
5. Sugar is vegetable, and manufactured.	5. Bring out *vegetable*, by reference to the sugar cane, of which show a specimen. *Manufactured*, by comparison of the cane with its product (sugar). Some information given as to the processes the article undergoes in the course of manufacture.

Points, as worked out, written on the board.

Summary.—Erase "Matter." Children say which of the qualities they have considered have been discovered by sight; which by feeling; by taste; by experiment; and by reference to previous knowledge. Write the qualities, as the children shall dictate, in separate columns.

Qualities discovered by more than one sense, may be written in separate columns, thus:—

Sense of Sight.	Sense of Feeling.	Sense of Taste.	Experiment.	Previous Knowledge.
White.	Rough(?).	Sweet.	Fusible.	Cultivated.
Sparkling.	Hard.		Soluble.	Manufactured.
Opaque.			Brittle.	Vegetable.
Rough(?).			Granulous.	
			Crystallized.	

Students in training construct a sketch of a lesson on "Bread," after the model of the one on "Sugar."

6. *Sketch on a Mould Candle.*

Points.—Material and Structure. Adaptation of each to uses.

I. *Shape and Substance.—The candle is long*—length compared with girth. *Slender*—girth compared with length. *Nearly cylindrical.* Number and kind of sides of a cylinder observed. In what respects the candle differs. Description given—*It is made of tallow and cotton, the tallow outside, the cotton inside, where it forms a loop at one end.* Materials and their position observed. Terms *wick* and *loop* given.

II. *Qualities.*

1. *Tallow is an animal substance*—brought out by reference to whence we get it. *It is white*—by sight. *Adhesive*—a little dropped on some paper. *Impressible*—the candle scratched by a match or pin. *Solid and fusible*—candle lighted, and the part nearest the flame compared with the rest. What makes the difference?

2. *Cotton wick is white and soft*—by looking and feeling. *Tough*—by reference to breaking a candle; what part remains unbroken. *Fibrous*—compared with chalk, which is formed of little grains. *Is a vegetable substance*—refer to the source from whence it is obtained. What, then, is cotton? Told a little about the cotton tree; that it grows in warm climates, &c. Picture shown. *Is absorbent*—lighted wick observed. *Is inflammable*—wick lighted.

III. *Uses, and qualities on which the use depends.—Candles are burned to give light. This use depends on the fact that the wick is inflammable and absorbent, and the tallow inflammable and fusible.* Tallow and wick compared. In what respects they are alike. What the wick would do without the tallow—smoulder away without giving much light. The tallow without the wick—flow in all directions while blazing away. What the wick does to the tallow—absorbs it. Then "the wick must be not only inflammable, but absorbent." In what state the tallow is when

absorbed—in a liquid state. "Tallow must be not only inflammable, but must be fusible."

Matter put on the board point by point, as worked out. Read by the children. Erased by the teacher, who writes:

I. State the parts of the candle.

II. State on what qualities—1, of the tallow; 2, of the wick—the use of the candle depends.

Children reproduce the lesson on their slates.

Students in training construct a sketch on "Match," modelled after the one on a "Candle."

7. *Sketch on a Knife and Fork.*

Points.—Material and Structure.—Adaptation of each to use.

I. *Objects Observed and Compared.*—1. *Resemblance.*—Traced by the children. As to use—both used in taking food. Substance—partly mineral and partly animal. Make—both have handles, shanks, and points.

2. *Difference.*—In use—one to cut up the food, the other to keep it firm and convey it to the mouth. In make—the one has a blade, the other a shank spreading out into three prongs. Why this difference?

II. *Adaptation of Make to Use.*—Children to determine this. Handles and shanks to both. Why? The blade of the knife—why thin at one edge? Why blunt at back?—to allow the pressure of the finger in cutting; also to strengthen the blade. The fork—its shank—why longer than in the knife? Why partly visible, and not, as in the knife, hidden by the handle? Its use. Prongs—their number, and the reason for this number. Why narrowing towards the points? Why edged, and not quite cylindrical?—to give them a firmer hold in the meat. Use of the shoulder.

III. *Adaptation of Material to Use and Structure.*—Children to discover this by comparing it with various other substances.

1. *The Blade of the Knife.*—Why not of stone?—a stone blade could not give way when, being used, it might happen to come in contact with any other substance, as gristle, &c. It is

not flexible. Why not of lead?—a leaden blade would bend, lose its shape, and become useless. Not elastic. Why not of tortoise shell?—a tortoise shell blade as likely to break as to yield. Why not of wood?—a blade made of wood, or of any of the other substances, would not take an edge sufficiently fine and sharp. The last two substances not sufficiently hard or tenacious.

Requisites for the blade of a knife determined by the children—*flexibility, elasticity, tenacity, hardness.* Why not of iron, which possesses all these qualities?—the blade must be very smooth, and capable of taking a high polish, to cut thin, smooth slices. Substance possessing all these requisites—steel.

2. *The metallic part of the fork.*—Qualities required—tenacity—hardness—capability of taking polish. Steel required for this also.

3. *Handles.*—Must be light. Why?—the metal is heavy. Smooth. Why?—that the touch may be pleasant to the hand, and that they may be easily cleaned. On these accounts commonly made of bone—the more expensive ones of ivory.

Summary.—The children required to reproduce—first, orally from the board, and afterward in writing on their own slates.

Students in training construct a sketch on "Pen and Pencil," modelled after the one on "Knife and Fork."

8. *Sketch on the Spider's Web.*

Point.—Material and Structure. Adaptation of each to use.

MATTER.	METHOD.
1. The garden spider makes a web in which to take its prey.	1. Draw a diagram of the web on the board, getting the children to notice the kind of lines made—whether vertical or horizontal. Finally, let them say what object the whole represents, and of what use it is.
2. The spider's web is made from a thick glue contained in its body. The creature has five or six holes in its sides, out of which the glue oozes. This substance is very tenacious, and can be drawn into the finest threads.	2. Question as to material of which web is made. What it is like? How they know it is not cotton, silk, or hair? Having exercised their reason and curiosity, tell them. Show some ravelled silk, and tell them it would take many of the spider's threads to equal one of these—thus giving them an idea of their thinness. Draw threads from some heated sealing-wax, to develop the idea of *tenacious*—give the term. Let them apply it to spiders' threads. Get other examples. If not readily given, refer to melted glass, metal, or even molasses. Then, from experiment with the sealing wax, the children will see that the more the threads are drawn out, the thinner they must become.
3. (*a*) To begin her web, the spider presses her side against the wall; then a drop of glue comes out, which sticks.	3. (*a*) Tell children.
(*b*) She then jumps to the other side, carrying the thread with her. She goes backward and forward several times, ever adding to the thickness of the thread.	(*b*) Illustrate this on the board. Let the children say how the doubling, trebling, &c., will affect the thread. Whether there would be one thick thread, or several thin ones, and why?
(*c*) She next goes from corner to corner, and then across, until the whole space is filled up with threads regularly arranged.	(*c*) Illustrate this by drawing lines in order on the board. Let children notice how closely the threads come together.
(*d*) She fastens the sides to the wall by threads projecting from the outer edge.	(*d*) Draw from the children how this can be fastened to the wall, and what quality enables the threads to fasten themselves.
(*e*) Lastly, she makes a little cell in the middle underneath, in which she can hide while watching for prey.	(*e*) Tell them of the cell; of its situation out of light. Let them say of what use it can be to the spider.
4. The material of the web is a tenacious	4. Facts, from memory—results, by reason; for instance, let the children discover

glue. Its threads are thin, drawn closely together, and wonderfully strong, first to catch, and then to hold the prey.

what would happen if a fly came to a web, the threads of which were wide apart, or made of a very fragile substance. Refer to an insect in molasses or cream; show that the more it struggles, the more it is stuck fast.

In conclusion, refer to the discomfort of flies in summer, the mischief they do, &c. Let the children say of what use the spider is to man. Refer to the wisdom of God in creating the spider.

Students in training construct a sketch on "Cocoon," after the model of the one on a "Spider's Web."

9. *Sketch on the Honeycomb.*

Point.—Material and Structure. Adaptation of the latter to uses—so brought out as to develop the idea of Instinct.

I. *Material.*—Made by bees of a substance obtained from flowers, and called wax. Usually found in a kind of box called a hive. Refer to the condition of bees in wild countries, where no hives are provided for them. What they occupy—cavities in rocks, holes in trees, &c. Refer to the reed baskets used in Africa.

II. *Structure.*—Why the bees make the comb—to put their honey in. How adapted to *this* purpose—by being full of cells. Give the term *cellular*. Also to keep the young bees in before they are able to fly about, &c. The young of the bee is round in shape. Children say of what shape they would expect their cradles to be. Whether the cells are of this shape—they are six-sided. Give the term *hexagonal*. Why hexagonal, and not round? To bring this out, draw two diagrams on the board, one representing round, and the other hexagonal cells. Direct attention to the spaces between the round cells. Suppose this space filled up with wax, as it would be in the honeycomb, of what use would the wax be there? None; it would be a waste of material. But suppose the bee to take away with its pincers all the wax between the cells, except a thin thread; this would save the wax, but what the effect would be—this would be too

fragile; the weight of the young bee would crush it. How wonderful to see the little bee meet these difficulties, by making hexagonal cells, which take the least amount of wax consistent with the proper strength of the comb, and are just as good to keep the young bees in.

III. *The faculty of the constructor.*—Refer to themselves, their work, their lessons (as writing). At first they do a thing badly, then better, and at length very well. But the bee makes the first honeycomb as well as the last. If several men had to make each a cradle, and without seeing the work of the rest, their workmanship would be very different; perhaps, too, the material and the design. The work of bees of the same class is always the same. The bees in the garden of Eden worked as the bees in their gardens to-day. The faculty which enables the bee thus to work is called *instinct*. Children give examples of instinct as shown by other animals. Children say how they recognize instinct. (*a*) Instinct never improves; its work is as perfect first as last. (*b*) The work is the same as done by all other creatures of the same kind.

Instead of summary, draw from the children a statement of the advantage of hexagonal over round cells, and definition of instinct.

Students in training construct a sketch on "Bird's Nest," after the model of the one on "Honeycomb."

10. *Sketch on the Palm Tree.*

Point.—To exercise the children on information given.

I. *Fruit.*—Show this to the children, and let them say what kind of substance it is. Get or give the name of the fruit. Let them describe it as to *shape*, *color*, *parts*, *flavor*. Let them taste it. Write on the board the following:—The date is a fruit of an oblong shape; it has a tough, smooth skin, a pulpy part, and a very hard stone in the centre.

II. *Tree.*—Tell the children that the dates have been gathered from a tree which grows in a country far away. Describe the country as having large sandy plains, arid and barren. Refer to the heat of the climate, and the intense thirst caused by this.

The condition of travellers after marching many miles. They see a grove of tall trees. Name of these. How travellers feel when they are covered from the hot, burning sun, and can eat the fruit. Draw picture of the tree, and direct attention of the children to the height the trunk of the tree grows without leaves. Tell them it grows from sixty to one hundred feet. To give the idea of the height, compare it with the length of the school room, fence, or yard. (W. B.): "The date palm grows in the desert. It has a trunk which is from sixty to one hundred feet high."

III. *Uses.*—Children to name those parts of the tree likely to be useful to man, and the uses made of them. Correct errors, and supply information. (W. B.): "The fruit is used for food. The stones are bruised for the seeds, which are given to the camels. The leaves are made into baskets and hats. The wood is used for building houses."

Summary.—Recapitulation of lesson from memory.

Students in training construct a lesson on the "Cedar," modelled after the one on the "Palm."

LIST OF IDEAS TO BE DEVELOPED AND TERMS TO BE GIVEN, ETC., IN THIS STEP.

1. Terms expressing less obvious qualities; as, buoyant, ductile, malleable, tenacious, sonorous, fertilizing, conservative or preservative, aromatic, medicinal, emollient, mixable, amorphous, slimy, &c.

2. Terms expressing ideas referring to structure; as, woven, cellular, tubular, netted, serrated, indented, crystallized, concave, convex, spiral, &c.

3. Terms expressing ideas referring to the nature and condition of substances; as, metallic, fluid, watery, sweet, saline, vinous, manufactured, exported, imported, &c.

FOURTH STEP.

Includes Classification of Objects, and so leads up to science. Also, Classification of Qualities. Lessons on the senses themselves should be given at this step.

Where the course of instruction does not contain a course of lessons on Actions, which properly lead to manufactures, arts, &c., some consideration of these subjects may properly be referred to Objects, Fourth Step; as, metals, and manufacture of articles made from metals, liquids, and textile fabrics. See "Lessons on Objects."

1. *Sketch to Develop the Idea of Distinction between the Essential and Accidental Qualities of an Object.*

I.—Teacher presents a number of various pieces of sealing wax, telling the children to find, state, and classify the differences. They are red, blue, green, &c.; therefore they differ in color.

One is thick, slender, long; therefore they differ in size.

One is flattened, another cylindrical; therefore they differ in form.

By experiment, one is hard, softened, fused, whole, broken, stamped; therefore they differ in condition.

II.—Children required to state the resemblances—vegetable, fusible, impressible, and adhesive. Children led to see that we can have no sealing wax which has not the four qualities; while we often have pieces not red, not cylindrical, or not stamped. Terms and definitions given. "The qualities which a thing must have to be itself, are called essential qualities. Qualities which it may have, but can be itself without having, are called accidental."

2. *Sketch to Develop the Idea of the Distinction between Generic and Specific Terms.*

I.—The teacher, standing before a large table covered with a variety of objects, including pictures of birds, which can readily be classified, desires first one and then another of the children to group all that should go together. Children group—

Swallow, Robin, Kingfisher, . . . as Birds.
Silver, Gold, Iron, ... as Metals.

Wheat,	Maize,	Oats,	as Grain.
Water,	Milk,	Ink,	as Liquids.
Tulip,	Lily,	Rose,	as Flowers.

II. *Differences in terms distinguished.*—Ask children whether we can call all flowers *roses?* No; for some are violets, some are pinks, &c. Whether there are more flowers or more roses in the world, and why? Children thus led to see that *flower* is the name of a large class, while *rose* is the name of a smaller class contained in the large class. Compare this with a school, and its classes.

III. *Names given and applied.*—Tell the children that words which express the large class are said to be *generic*, and words which express the small class said to be *specific.*

1. Let them apply these terms to flower and rose, respectively.

2. Give jewel as the name of a large class, and let the children give the name of some smaller class belonging to it, as diamond, &c.

3. Then give trout as the name of a small class. Children to find the name of the large class to which it belongs.

Children give as many examples of generic and specific qualities as needful. Put down all the examples in two columns under the proper heads, as the children shall direct.

Examples.

GENERIC.	SPECIFIC.
Picture.	Painting.
Pillar.	Column.
Edifice.	School house.
Temple.	Church.
Furniture.	Chair.
Ornament.	Bracelet.
Servant.	Slave.
Feature.	Nose.

3. *Sketch of a Lesson on Shells and their Inmates.*

MATTER.	METHOD.
I. *Use.*—Shells are found in the sea; also in rivers, and some on land. They serve both for the homes and armor of certain animals. These have no bones, and cold, white, or colorless blood, and, being soft, are called mollusks.	I.—Bring before the children some shells. Let them say what they are. Where found? Supply information as to shells found inland, and by reference to them as marine objects, lead children to conclude that wherever they are found the sea must once have been. Show an oyster shell containing its inmate. Children state the use of the shell. The last use brought out by reference to its defenceless condition without it. Let a child press the oyster; then press his own chin or forehead. The difference, and its cause. What they can say of the oyster. (S. R.): "The oyster has no bones." Another difference discovered by touch. Its cause. (S. R.): "The blood of the oyster is cold." Refer to the color of our blood. Cut the oyster, to show the watery liquid. (S. R.): "The blood of the oyster is colorless." Children told that all animals living in shells resemble the oyster in all these points, and on account of their soft, boneless structure, are called mollusks. Children dictate the matter of this head. (W. B.)
II. *Of what composed.*—Shells are formed from the animals which inhabit them. They are composed of three substances: 1, lime, a sort of chalk, which the creature obtains from the water; 2, a glue given out by it from its own body—this varies in color, and gives color to the shells; 3, part of the	II.—Refer to storms at sea, the waves dashing the shells against rocks, &c., and lead children to see that shells require to be made very strong. Show a specimen of the lime as one constituent part. Where the animals can find such a substance. Refer to the limestone rocks of coasts, and coating inside teakettle. Whether this substance alone would make a good shell (too brittle). What more required—some substance not brittle, the reverse of brittle, to mix with it. Show glue. Let children recognize it as an animal substance, and show the quality on which its use as a constituent part of the shell depends.

skin of the animal, which lines these. The shells, when broken, may be made new again. The new pieces are brighter in color than the old.

Tell children that the glue used to make the shell comes from the animal itself. Note the beauty and color of the various shells. Let the children name the colors, and try to account for their appearance. Give information. Let them give examples of similar variations in other classes of Nature's works (birds, stones, &c.). How the animal obtains the shell—it is part of itself; grows with it. Refer to broken shell. These objects, which are very liable to be broken, can be repaired. Appearance of the new piece on the shell. Refer to a new piece of material put upon an old garment, &c.

III. *Different kinds of Shells.*—Shells are very numerous. There are many thousand different kinds. These are divided into three classes, viz.:—
1, those of one piece;
2, those of two pieces;
3, those of three pieces.

III.—Bring the children specimens of each kind. Let them discover how they differ in structure, and classify accordingly. Matter of the lesson dictated by the children, and placed on the board.

4. *Sketch on Plants of the Cruciform Tribe.*

MATTER.

I. *Structure.*—In plants of this tribe the corolla is formed by four petals placed crosswise; hence the name. There are six stamens, four long and two short. The seed vessel is a pod, differing from that of the pea in having two partitions.

II. *Qualities.*—These plants bear flowers of different colors. Brown, as the wall flower; pink or puce, as the stock; white or yellow, as mustard, turnip, radish. No flower of the tribe is blue, nor can any amount of cultivation produce a blue flower. The flowers have a sweet smell except when decayed, and then the smell is particularly disagreeable, on account of the escape of a gas on which the characteristic qualities of these plants depend. They are all highly pungent, all wholesome, and even medicinal.

III. *Uses.*—We cultivate some of these plants for their sweet smell, as the stock and wall flower; some for food, as the cabbage and watercress, for their leaves; the turnip and radish, for their roots; some for what we call a relish, as mustard and horse radish. All this food purifies the blood. Sailors, who take long voyages, and consequently suffer from scurvy, almost always find a plant of this tribe (*Cocheleria*) growing on the shores of uncultivated lands. They eat it, and this cures them.

METHOD.

I.—Bring flowers of this kind before the children. Let them observe the distinct parts of these. Direct special attention to position of the petals. Refer to the derivation of the name, the number and length of the stamens, the compartments of the pistil. Let children name all cruciform plants they know. (W. B.)

II.—Children, with reference to the list on the board, name the different colors of the flowers. Lead them to see that they have mentioned no blue flower; there is not one in the tribe. Let them describe the scent of any of these flowers when fresh. Refer them to the condition of water in which wall flowers have been kept, or in which cabbage has been boiled. Refer to the mustard plant, the chief quality of mustard—pungency, leaving them to infer that all plants of the same kind partake of the same quality.

III.—Refer to the list on the board. Children mention the use of each separately, then classify the uses. Bring out the distinctive use of mustard and horse radish, by asking if these would serve as the only vegetable at a meal. Explain the effect of eating only salted meat, and refer to the goodness of God in providing a cure.

Summary.—Children reproduce the lesson from the heads.

5. *Sketch on Flavors.*

MATTER.	METHOD.
I. *Flavors.*	
1. Some things are sweet to the taste.	I.—1. Developed by experiment with sugar. Children give the term. No definition given.
2. Some things are luscious to the taste.	2. Developed by experiment with molasses. Children describe the flavor. Term and general definition given: "Anything which is extremely sweet, is said to be *luscious*."
3. Some things are bitter to the taste.	3. Developed by experiment with quinine. Children give term. No definition given.
4. Some things are acid to the taste.	4. Developed by experiment with cream of tartar. Children give the term. No general definition given.
5. Some things are acrid or alkaline to the taste.	5. Developed by experiment with soda. Term and general definition given: "Anything that has a burning, bitter taste, is said to be *acrid*." Children told that soda is one of the substances called alkalies, whence we sometimes speak of its taste as *alkaline*.
6. Some things are saline to the taste.	6. Developed by experiment with the blue and white papers called Seidlitz powders, after the flavor of each powder has been separately ascertained. Term and general definition given: "Anything having the taste of salt is said to be *saline*." A saline substance can be obtained by combining an acid and an alkaline substance.
7. Some things are brackish to the taste.	7. Developed by putting a little salt in water. Children describe the taste. Term and general definition given: "Anything that has a slightly salty taste, is said to be *brackish*." Refer to springs in the desert.
8. Some things are astringent to the taste.	8. Developed by experiment with alum. Children describe the effect on the mouth. Term and general definition given: "Anything which draws up or contracts the mouth is said to be *astringent*."

9. Some things are pungent to the taste.	9. Developed by experiment with mustard. Children referred to scents of the same character. Give the term. General definition given: "Anything which has a hot, biting taste, is said to be *pungent*."
10. Some things are aromatic to the taste.	10. Developed by experiment with cinnamon. Children being referred to scents of the same character, give the term. General definition given: "Anything which has a hot, strong, pleasant taste, is said to be *aromatic*."
11. Some things are savory to the taste	11. Developed by reference to gravy, &c. Children describe the flavor. Term and general definition given: "Anything with a rich, saltish, pleasant taste, is said to be *savory*."
II.—The sense by which we discover each of these qualities, we call *taste*; the quality itself we call *flavor*.	II.—Developed by writing two sentences on the board, in each of which the word *taste* is used in a different sense. Children say how used. Are told that there is another word which expresses the quality, and what advantage there would be in using it. Teacher writes the general term *flavor* above the list of specific flavors, which have been written on the board as given.
III.—Things having a flavor are said to be *sapid*. Things having little or no flavor are said to be *insipid*. Things having a highly agreeable flavor, are said to be *delicious*. Things having a disagreeable flavor are said to be *nauseous*.	III.—Terms and definitions given. Examples found by children.

Summary.—1. Children read the list of flavors, and in turn give examples.

2. Teacher gives the definitions in any order, children giving the term which expresses each definition.

3. Teacher erases the list of flavors, children supplying it.

4. Children add each of the definitions given to the corresponding term.

The summary may be omitted until the next day, and used as an exercise on the previous lesson.

6. *Sketch of a Lesson on Qualities, discovered by the Sense of Feeling.*

I. *Introductory.*—Teacher refers the children to a former lesson, in which they have brought qualities of an object to the test of all their senses. Tells them that the subject of this lesson will be all the qualities they can discover by means of one sense—*feeling*. Let them name all the qualities they can think of. (W. B.) Teacher then engages them to try experiments, in order to find out what more can be known.

II.—1. Teacher blindfolds the first child. Presents him with a stone, cotton, water, tube, &c. He says: "By *feeling*, we can discover whether objects are hard, soft, liquid, or hollow."

2. Teacher blindfolds second child, and presents him with a nutmeg grater, an oyster shell, a piece of carved wood, &c., who says: "By *feeling*, we can discover whether things are rough, smooth, level, or uneven."

3. Teacher proceeds as before, by examining the contents of a box of solids, and comparing these with lumps of chalk. The third child says: "By *feeling*, we can discover whether objects are edged, cubical, cylindrical, or (in fact) any regular form, or of an irregular form."

4. Teacher presents measures of different lengths. The fourth child says: "By *feeling*, we can discover whether things are long or short, thick or thin, deep or shallow."

5. Teacher places several similar objects at various distances. Fifth child says: "By *feeling*, we can discover whether things are near or far, and how far." [Exercise on the absolute distance, whether an inch or a foot.]

6. Teacher places the same objects in different positions, and sixth child says: "By *feeling*, we can discover whether things are up or down, without, within, or between."

7. Teacher presents a piece of sealing wax that has just been used. Seventh child says: "By *feeling*, we can discover whether things are burning, hot, warm, lukewarm, cool, cold, or freezing."

8. Teacher presents a sponge, before dipping it in water, and after wringing it; an eighth child says: "By *feeling*, we can discover whether things are dry, wet, or moist."

III.—Children compare these ideas with those discovered by themselves at the beginning of the lesson. Teacher may do well to refer to the use of *object lessons* in giving accurate and systematic knowledge, instead of the imperfect knowledge that is gathered from a merely superficial observation.

IV.—Children led to find general terms inclusive of each set of the particular terms before used. They dictate what is to be put on the board, thus:

By the sense of *feeling*, we discover,

1. The Character of the Substance.
2. The Character of the Surface.
3. The Form.
4. The Size.
5. The Distance.
6. The Position.
7. The Condition, as to Temperature.
8. The Condition, as to Moisture.

7. *Sketch of Lesson on an Egg.*

I. *Shape.*—An egg is oval, smaller at one end than the other. The word oval is derived from *ovum*, the Latin for egg.

II. *Parts—Order of Position and Formation.*—An egg consists of several distinct parts: 1, the shell; 2, the skin between the shell and albumen, or the *membrane;* 3, the albumen; 4, the skin between the albumen and the yelk, or the envelope; 5, the yelk; 6, the embryo. The order of the original formation of each part is exactly the reverse of the position. To these parts, though not as a distinct part, may be added the follicle.

III. *Use of each Part.*—1. The shell protects the interior parts. 2. The membrane is of use to strengthen the shell and to prevent injury to the young bird; probably also to keep the external air from penetrating, and to keep the albumen from mixing

with the shell ere it becomes hardened by exposure. 3. The albumen serves as nourishment for the young bird. 4. The envelope prevents the yelk from mixing with the albumen. 5. The yelk is the substance from which the bird is formed, as the albumen is the nourishment during formation. 6. The embryo is the yelk in process of formation. 7. The follicle contains the air for the use of the young bird.

IV. *Qualities on which Uses depend.*—1. *Shell.*—Advantages of the shape—being oval, it is not so likely to be broken as if it had corners. The shape also renders it more comfortable for the mother bird during the process of hatching, and more convenient to be turned over, that each part may receive equal warmth. This shape, too, suits that of the bird before it is fully developed, and admits of the little creature's free egress.

2. *Obvious Qualities of the Shell.*—Hard, smooth, brittle, thin, porous. *Hard*, that it may keep its shape under pressure; *smooth*, pleasanter to the touch—less liable to be broken when coming in contact with any roughness of the ground; *brittle*, that egress may be afforded to the chick; *thin*, for the same reason, and to prevent waste of material; *porous*, to admit air.

3. *Qualities of the Membrane.*—Tough, smooth. *Tough*, to strengthen the shell; *smooth*, on account of the chick.

4. *Qualities of the Albumen.*—Thick, glutinous, insipid; is soluble in cold water, curdles in hot water. Effect of heat in hatching the bird, &c.

5. *Qualities of the Envelope.*—Strong, thin, impervious.

6. *Qualities of the Yelk.*—Sapid, colored.

8. *Sketch of Lesson on Writing Paper.*

I.—The children are desired to discover the qualities on which the use depends. It is *smooth*, in order that the pen may pass over it; *glossy*, to prevent the ink from penetrating; *flexible*, therefore easily folded into the form of a letter; *thin*, therefore *light; portable*, therefore *cheaper.*

II. *Substitutes for Paper.*—Tell the children that paper was unknown in ancient times. Let them say how people could manage when they wanted to send news—they could send messengers. Why this was not so good as writing notes—some trouble, and less certainty. But we have another use for paper. When war breaks out, or some great deed is done, we like to write it in a book, that it may be remembered. How people that had no paper could keep their records. Refer the children to what they have read in the Bible. The commandments were written on tables of stone. Joshua wrote a copy of the law on tables of stone. The high priest had an inscription on a gold mitre. Hezekiah desired that his writing tablets should be brought. Explain to the chidlren that the tablets used in those days were generally of wax.

The rolls mentioned in the Bible were of parchment. Why called rolls? Children dictate the list of substances formerly used in lieu of paper—stone, metal, wax, parchment. Consider the comparative convenience of using each of these. Tell them that the Egyptians used something else. A plant used to grow on the banks of the great river which waters their country. The people took the bark of this, and pressed the edges together till they adhered. Whether the same thing could be done with narrow strips of paper? Children mention things that will adhere, as postage stamps, &c. What quality this bark must have possessed—it contained a sweet gum. Was called *papyrus.* Children say why the pieces of bark were allowed to adhere at the edges only. When a large sheet was formed, it was rubbed with a glass or metal ball. The use of this operation.

III. *Modern Paper.*—Tell them that the first paper, properly so called, was made in Spain, of cotton wool, and afterward of woollen rags. The first mixture of linen rags was accidental; but when it was discovered that paper was improved thereby, more linen rags were added next time, and so on until only linen was used, and the best paper produced as a result. In the reign of Henry III., a ship laden with this paper was wrecked off the coast of England. The booty was considered of so much importance, that several records are still in existence in which the fact is mentioned. In the reign of Queen Elizabeth, the first paper mills were established in England. For a long time, only a little paper was used. Why so much more required now? It was feared that there would not be enough nice white rags to make good

paper. An ingenious German—Schaffer—thought he would ascertain of what other substance paper could be made. Some he made of straw, some of vine tendrils, some of fibrous roots. In what these substances were alike. But soon after this another ingenious man found out, that by using a substance called chlorine, he could take the dye out of colored rags, and make them perfectly white.

IV. *Ancient Paper.*—Refer again to the substitutes for paper formerly resorted to. Tell the children there was one nation which in ancient times used paper. Let them enumerate the ancient nations with which they have any acquaintance, as, Jews, Egyptians, Romans. Whether it could be any of those, and why not? Refer to the map, and point out China. Tell them that hundreds of years ago the Chinese were in the practice of making paper, by grinding the bark of a tree, and placing it in water. When steeped to a pulp, it was poured into shallow moulds, placed one on the top of another, with a bulrush mat between each mould, and a reed under each mat. These mats were raised every day, that the paper might dry gradually. Children state the use of the mats, and the use of the reeds. Produce a specimen of rice paper, and explain how this is obtained. It is the pith of a water weed. In the finest specimens this is found as large as the thumb of a man. This is pared in a circular direction with a knife.

9. *Sketch on Comparison of Wine and Water.*

I. *Qualities compared.*

Wine is	Water is
1. Artificial.	1. Natural.
2. Colored.	2. Colorless.
3. Only semi-transparent.	3. Transparent.
4. Odorous.	4. Inodorous.
5. Sapid.	5. Tasteless.
6. Stimulating.	6. Only refreshing.
7. Exhilarating.	
8. Nourishing.	
9. Astringent.	7. Relaxing.
10. Heating.	8. Cooling.

II. *How these Qualities in each Liquid render it useful to man.*—Water must of necessity be natural, as such a quantity is needed by man for his use. It must be colorless, transparent, inodorous, and tasteless, otherwise it would not be pure, and consequently of little service, as it would destroy or detract from the taste of substances with which it is mixed. Its cooling and refreshing qualities give it great advantages over any other liquid. The sapid, stimulating, exhilarating, and astringent qualities of wine, render it particularly useful to man.

III. *How these Liquids are obtained.*—Spontaneous evaporation is the origin of any quantity of water. This is continually taking place from off the surface of seas, lakes, &c.: the vapors ascend, and form clouds; these, on attaining a higher region, become condensed; by the power of attraction they descend to the mountains, the particles become separated, and percolate into the earth; then the water, where it finds the least pressure, forces a passage; a fissure is consequently made in the mountains, and a spring is thus originated, which flows onward till obstructed; at such a place the water accumulates, and ultimately gives rise to a river, which in its course is joined by others, and these continue their onward motion till they are lost again in the mighty ocean. Then the same thing again occurs; and therefore we may perceive, as it were, a complete revolution in the formation of water as used by man.

To obtain wine, vines must first be planted. When the fruit is sufficiently ripe, it is gathered, placed in large vessels, and pressed. Perforations in the bottom of the vessel allow the juice to flow out into another, from whence it is taken and casked. Then there is a fourfold repetition of this process: 1. The liquid becomes sweet; this is the *saccharine* fermentation (example, wort). 2. This process evolves another substance, and we have the *alcoholic* fermentation; in proportion to the quantity of alcohol contained in the liquid, the next process is retarded. 3. It becomes sour; this is the *acetous* fermentation. When a fourth change takes place, it is the symptom of decay and corruption, and is called the *putrefactive* fermentation. Wine is fit for use after the second fermentation. The wines of Hungary have been known to form so thick a crust around the inside of the cask, that

the wood could be removed without causing the wine to flow out.

IV. *Qualities referred to in Scripture.*

WATER.	WINE, IN MODERATION.
1. Unstable. Gen. xlix. 4.	1. Cheering. Judges ix. 3.
2. A Solvent. Job xiv. 19.	2. Gladdening. Ps. civ. 15.
3. Penetrating. Ps. cxix. 18.	3. Strengthening. Cant. ii. 5.
4. Reflective. Prov. xxvii. 19.	4. Medicinal. 1 Tim. v. 23.
5. Refreshing. Ps. xxiii. 2.	
6. Purifying. Ezek. xxxvi. 25.	IN EXCESS.
	1. Intoxicating. Eph. v. 18.
	2. Infuriating. Prov. xx. 1.
Water is typical of regeneration and sanctification—cleansing and purifying in its nature. It is particularly typical of the work of the Holy Spirit, and is used in baptism.	*Wine* is *rather typical*—1, of consolation; 2, of the reviving and invigorating graces of the Spirit.

NUMBER.

INTRODUCTORY REMARKS.

LESSONS ON NUMBER introduce the pupil to subjects which afford a higher exercise of mental power than any of those which have hitherto engaged attention.

In the study of the properties of number, Pestalozzi did not aim at the mere acquisition of the science, and of mechanical dexterity in calculation; he considered the subject to be a valuable means of awakening intelligence, of forming the judgment, and of developing the reasoning faculty. His method of presenting the first principles of the science also differs greatly from that ordinarily pursued; he trained the mind to grasp the full perception of the value of numbers, by observation upon them as illustrated in surrounding familiar objects; and when by this process the abstract idea was acquired, he then, but not till then, communicated the symbol by which it is conventionally represented. It was found that pupils trained on these principles were themselves enabled to deduce the practical *rules* of arithmetical calculation from the very examples on which their minds had been previously exercised.

This may be a slow process; but it has been well observed, that "when the true end of intellectual education shall be admitted to be, first, the attainment of mental power, and then the application of it to practical and scientific purposes, that plan of early instruction which dwells long on first principles, and does not haste to make learned, will be acknowledged as the most economical, because the most effectual."

LANGUAGE.

INTRODUCTORY REMARKS.

ALTHOUGH direct and systematic lessons on language are, for the most part, unsuited to a primary school, much may still be done by the teacher to cultivate the habit of correct speaking. To this end care must be taken that ideas communicated to the children are conveyed to them in appropriate terms, and that, when giving expression to their own thoughts, they do so in correct and appropriate language.

In carrying out these objects, the following points deserve special attention:

1. All erroneous expressions made use of by the children should be immediately corrected, and the proper words fixed upon the mind by repetition. This incidental mode of teaching is the most natural and simple method of correcting those errors in language which the children of the poor acquire at their homes, and of supplying those deficiencies which belong to their as yet limited vocabulary.

2. In the daily work of the school room, all definitions of the meaning of words, and all descriptions of places, objects, or events, whether given by the teacher to the children, or elicited from them, should be clothed in simple and definite language, and fixed in the memory by repetition. A double object is thus attained; the mind is stored with knowledge for its own benefit, and furnished with appropriate language in which to convey it to others.

3. The children should be trained to give *complete* answers to

all questions which are put to them. Teachers too often content themselves with such answers as merely indicate that the child is in possession of the idea they wish to convey, without caring for the clearness or otherwise with which that idea is expressed; whereas experience teaches that nothing more tends to make an idea clear to the mind, and to render it a permanent possession, than the act of clothing it in accurate language. Monosyllabic answers, as "Yes" and "No," should be rejected, except when they express all that can be said on the subject.

Besides the above incidental mode of teaching language, which should be adopted in all the classes of a primary school, the following exercises are given for the special use of children from six to eight years of age.

The following exercises in Language are designed as Third Step lessons:

EXERCISE I.

To form sentences from given words—(1) the name of an object, (2) a word expressing quality, and (3) some part of the verb "to be."

Plan.—The children to name a number of objects, beginning, for example, with those of the various articles of furniture, &c., in the room; the teacher to write these names under each other on the slate, requiring the children to spell each word as it is written, assisting or correcting when necessary.

The children to be then required to say something regarding each object, the teacher helping them to determine how far the terms they apply are appropriate. The teacher to add these descriptions to the names already on the slate, and thus lead the children on to the formation of simple sentences, in their shortest form. A few examples follow:

The ink is black.
The slate is smooth.
The form is long.
That window is large.
This pencil is sharp, &c.

The children should then read over the sentences, and be led to observe that each begins with a capital letter, and ends with a full stop. The slate may then be turned away, and the class required to reproduce the lesson on their own slates, without its aid. When this has been done, the slate should be again referred to, that they may correct their exercises.

The children may be supplied with little books, in which to write out these lessons at home. For some time they should not be required to originate anything for themselves, but merely to reproduce that which has been taught in school. They will find pleasure in doing that which they can do well.

When all the objects in the room have formed the subjects of such lessons, those in the playground, the street, or in the fields, may be resorted to, gradually extending the circle to more remote objects. At the least a dozen lessons of this description should be given.

Exercise II.

The forming of contracted sentences. Of these there are two varieties: 1. That in which different qualities are ascribed to one and the same object. 2. That in which the same quality is ascribed to various objects.

First kind: The describing an object by various qualities.

Plan.—The teacher writes the name of some familiar object upon the school slate, and calls upon the children to apply it to its various qualities, writing them down as they give them. The teacher should assist the children in determining the suitability or otherwise of the qualities suggested, and also in spelling the more difficult words.

We may suppose a lesson in which the given name is "paper." It would present itself in some such form as this:

The paper is white.
The paper is thin.
The paper is smooth.
The paper is pliable, &c.

The teacher should next lead the children to notice that the

word "paper" need only be written once, and that the four sentences may be contracted into one. Then the teacher, directed by the children, writes:

"Paper is white, thin, smooth, and pliable."

The children then read this over, and are led to perceive the necessity for commas in those places where the words "the paper is" are omitted, and also the use of the word "and" between the two last words of the sentence. Lastly, the slate is turned away, and the children reproduce and correct the lesson, as in the case of the former exercise.

The words, chalk, iron, clay, coal, salt, water, air, snow, ice, sugar, glass, leather, thread, a pen, a needle, fire, wood, &c., &c., are suitable for lessons of this kind. The children may be encouraged to reproduce such lessons at home, forming, in the first place, the several simple sentences, and then contracting them as above suggested. Two or three such exercises will generally suffice for one lesson.

Second kind: The same quality attributed to several objects.

Plan.—A quality selected, sentences made, contracted, reproduced, and corrected, as above.

Glass is brittle.
Chalk is brittle.
Coal is brittle.
Glass, coal, and chalk are brittle.
Iron is hard.
Flint is hard.
Glass is hard, &c.
Iron, flint, and glass are hard.

The children to be led to notice the stops, as before, and the change of the word "is" for "are."

Subjects for sentences of this kind: Black, white, light, heavy, bright, sweet, sour or acid, cold, rough, porous, inflammable, soluble, fusible, pliable, &c., &c.

Exercise III.

An exercise on discrimination in the use of words.

Select an object, say a tree, and let the children apply to it every descriptive term that they can think of as applicable to any tree, thus: A tree may be young, old, tall, short, graceful, stunted, withered, green, bare, branching, large, small, smooth, gnarled, fruit-bearing, barren, upright, drooping, &c.

Then let them select all the terms that might possibly be applied to any one tree, and thus draw out a description of two or more trees from the above list of attributes, thus:

The tree is young, small, graceful, green, and smooth; or,
The tree is old, tall, large, branching, and fruit-bearing; or,
The tree is old, short, stunted, withered, gnarled, and barren.

Subjects for these exercises: Flower, man, monkey, house, sky, river, horse, mountain, book, water, an apple, &c.

Exercise IV.

Following the order in which a lesson on an object is usually given, we now take the verb "Have;" and the children are required to form sentences, naming the parts of objects, and the number of those parts introducing that verb.

1. To form sentences, describing the parts of objects, without reference to their number:

The tree has leaves. A bird has wings.
The cow has feet. The cube has faces.

2. Contracted sentences of this character:

The tree has branches.
The tree has leaves.
The tree has roots, &c.

Contracted—The tree has leaves, roots, and branches. The contracted form may be at once adopted, as its nature is understood from previous exercises.

3. Sentences in which the several parts of an object may be distinguished by a word expressive of quality:

The cat has soft feet.
The knife has a sharp point.
The cow has a long tail.

4. Sentences in which the several parts of an object may be described by their number:

The cow has four feet.
The cow has a tail.
The cow has two horns.

Contracted—The cow has four feet, two horns, and a tail.

The preceding exercises are confined to objects described as to their *qualities* and their *parts*, and only one example of each is given; but the teacher will, of course, take care that the children have as many as are necessary. We now proceed to sentences which include words expressing action or condition. As the vocabulary of the children at this stage is usually very limited, it is desirable to increase the stock of words at their command. This may be done by writing out lists of the names of objects, and of words expressive of actions. Each list should be formed of words which may be arranged under some general head, itself familiar to the children, and thus the principle of *association* will be brought to the help of the memory. Rigid classification should be avoided, as well as the introduction of terms difficult of explanation.

The children may be assisted in drawing up lists of words expressive of domestic and social relationship, of trades, occupations, and professions, or of the names of quadrupeds, birds, fishes, and insects; trees, garden vegetables, fruits, grain; minerals, metals, and liquids; articles of clothing, household furniture, &c. By way of variety, the children may be required to name the objects they have seen in the sky, in the field, or on the river; the various goods sold in a grocer's shop; the tools used by the carpenter, the shoemaker, or the smith.

Similar lists of words descriptive of actions should be made, beginning with those describing the powers and capabilities of the several organs of the human frame:

The hand—open, shut, hold, catch, grasp, &c.

The foot—stand, walk, run, stamp, dance, &c.

The mouth and voice—eat, drink, sip, speak, sing, &c.

The eye and ear—look, stare, gaze, listen, hearken, &c.

This may also be extended to acts of the mind; as, think, study, consider, invent, love, hate.

Actions peculiar to specific trades and occupations—cut, stitch, sow, plough, reap, mow, bore, saw, &c.

Actions characteristic of certain animals—walk, trot, gallop, fly, swim, crawl, climb, &c.

Sounds made by animals—sing, bark, neigh, low, bray, croak, hum, hiss, &c.

The children should also be required to write out words expressing some of those less evident actions effected in plants; as, grow, increase, spread, shelter, fade, wither, &c.; or those applied to liquids; as, pour, drop, flow, overflow, &c., &c.

The following remarks point out how such lists of words may be made so as to give them interest:

Suppose the children required to make a list of insects. Each of the children in turn gives the name of an insect, which is written on the board. When they can remember no others, the teacher may supply the names of any familiar insects they may have overlooked. The board may then be covered, and the children required to reproduce them. This done, the list may again be showed them, that they may correct errors in spelling, and supply any words they may have omitted.

These lists may also form very useful lessons for home work. In correcting them, the teacher asks the first child in the class to read out his list, writing it upon the board as he does so. Another child is then desired to mention any words his list may contain which are *not already on the board*. The same plan to be adopted with the other children, until a complete copy of all the names the children have noted will be formed upon the board.

From this the children are then permitted to correct their errors in spelling, and to complete their several lists of words.*

Much varied information may be given to the children in connection with the new words they learn as these lessons proceed; but great care should be taken that the lesson on language is not lost sight of in the communication of this general information.

Exercise V.

Sentences containing words expressing action. I. The subject and the action complete the sense. II. An additional word is required to complete the sense. III. Exercises on sentences of both these classes.

I. Sentences containing a word expressive of an act which, with its subject, makes a complete and significant sentence.

Plan.—The teacher writes in column on the board a list of words expressing actions; as, stand, walk, run, &c.; and the children, with the assistance of the teacher, form these into sentences, by the addition of the name of an object, animal, &c. They are then erased, and the children reproduce the exercise without help.

1. Sentences where the subject and the action complete the sense:

The horse stands.
The child sleeps.
The scholar sits.

These exercises to be repeated, putting both the object and the act in the plural form:

The horses stand.
The children sleep.
The scholars sit, &c.

The actions characteristic of animals, and the sounds they utter, will afford great variety in these exercises:

* It is not necessary that any large number of lists of words should be made before proceeding to the following exercises. The object is to furnish with words, and the teacher may resort to the lists whenever the introduction of new words is found desirable.

The fish swims.
The bird flies.
The serpent crawls.
The bee hums.
The frog croaks.
The dog barks, &c.

II.—Sentences in which, beside the subject and the object, an additional word is required to complete the sense:

I hold—the pencil.
He opens—the book.
The monkey climbed—the tree, &c.*

The children should be led to see the necessity for each additional word.

Actions peculiar to trades or employments:

The gardener digs—the ground.
The tailor cuts—the cloth.
The carpenter planes—the wood, &c.

As a more extended exercise, the name of the instrument by which an act is performed may be introduced into the sentence:

The gardener digs the ground with a spade.
The tailor cuts the cloth with scissors.
The grocer weighs sugar with a pair of scales, &c.

Words expressing quality may now be added to the subject or object; as,

The *little* boys play.
The *bright* sun is shining.
The *strong old* horse drew the *heavy* wagon.

Great variety may be given to these lessons, and the attention and interest of the children well sustained, by leading them to try

* The teacher need not object to the use of the past or future tense of the verb, provided the children use it correctly.

to find out how many qualifying words may be added to a sentence, and the peculiar force of each.

Exercise VI.

In the exercises which follow, the children are led to observe and describe some of those circumstances which are connected with various actions, and so identified with them that the mention of one is often suggestive of another. For example, such sentences as, The fish swims, The worm crawls, The bird flies, which call up simultaneously in the mind the ideas, In the water, On the ground, In the air.

Combinations such as these are simple, and readily understood; those of a more abstract nature should be avoided. There should be no attempt to lead where the children cannot follow.

Sentences.

The children sit on the forms.
Lions live in forests.
Ships sail on the ocean.
The leaves fall on the ground, &c.

Sentences with phrases expressive of time:

The sun rises in the morning.
We prepared our lessons last night.
The birds sing in the morning.
Dogs bark during the night, &c.

Sentences with words expressing the manner of performing an act:

The child walks slowly.
The dog barks loudly.
The lion growls fiercely.
Jane writes neatly.

As an example of the manner in which these lessons may be varied, we give the following sentences, in which two or more of the preceding circumstances are expressed:

Place and Manner.—The children sit quietly at the desks, &c.
Time and Manner.—The rain fell violently during the night.
Time and Place.—The rooks rest all night on the trees.

This is, perhaps, as far as it is desirable to lead the children of an infant school in such lessons as these. The subject may close with an example showing the mode in which two or more of the preceding sets of exercises may be combined in the simple description of an object. The teacher need not, however, wait till the foregoing exercises have been finished before such examples are introduced.

An Apple, described as to its qualities, its several component parts, its mode of growth, and its uses, or as to any other simple fact connected with it.

Exercises 1 and 2. An apple may be round, russet, smooth, juicy, odorous, wholesome, acid, and refreshing.

Exercise 3. It has a stem, a rind, or outer covering, a pulp inside the peel, a core, and seeds.

Exercise 4. It grows in orchards and gardens; it is sold at stalls in the streets, in fruit markets, at greengrocers' shops, and is used for making cider, as a table fruit, and for making apple pies.

In working out such descriptions, the children should be required to point out the value of each word, and to state what it adds to the description.

Thus, in the preceding lesson, the word *round* describes the shape of the apple; the word *russet*, the color of it; the word *smooth*, the nature of its surface; the word *sweet*, its taste; the word *wholesome*, the effects of it when eaten as food, &c.

Treated in this way, the lesson becomes truly a lesson on language. The children learn to distinguish between the idea and the word representing it.

Such a course of instruction on language, given in connection with objects, *insensibly* develops the perception of the nature of the principal words or parts of speech, probably better than could be done by lessons specially directed to that object. It only remains now that the teacher bring the subject of classification

directly before the children. This may be best done by leading them to *analyze* a few of their own lessons, arranging the words into *names, words expressing actions, qualities, relations*, &c. When this has been done, the teacher may communicate the grammatical names of nouns, verbs, adjectives, as introductory to more methodical lessons on grammar.

Such a course of teaching also prepares the mind for grammatical analysis.

READING.

INTRODUCTORY REMARKS.

THERE is perhaps no subject of school study that has presented more difficulties to the minds of the little learners, than Reading. This has been owing very much to the manner in which it has been usually presented. The English language is full of difficulties; and if we introduce the child to them all at once, we shall most certainly confuse and discourage him.

The principles of Pestalozzi so prominently insisted upon, that but one difficulty should be presented at a time—that the business of the teacher is analysis—that all difficulties should be divided and subdivided, until reduced to their simple elements—and that the work of the infant learner is *synthetical*, are peculiarly applicable in the prosecution of this subject.

It has been our aim, in the following lessons, to treat the subject in conformity to these principles. We claim for the plan here presented the following advantages:

1. It puts the child in possession of a key by which he is able to *help himself*—a very important principle in education.

2. It is an excellent disciplinary exercise, cultivating accuracy of observation and expression.

3. It presents but one difficulty at a time, and thus avoids that confusion, and consequent discouragement, that so often attend the early efforts in learning to read.

4. It is thorough. By means of a progressive arrangement and classification, it puts the child in possession of a knowledge

of important elements in the English language that are often entirely neglected.

5. The plan is calculated to cultivate clearness of articulation, and lead the children, by easy and progressive steps, to a knowledge of the orthography of words.

We believe it to be an easy, thorough, and rapid method of learning to read and spell.

A set of cards and a little reading book have been prepared with special reference to accompanying these lessons, which we think the teacher will find of great assistance.

PHONIC READING.

FIRST STEP.

While in this Step, the children learn to distinguish and imitate forms, and to distinguish and imitate sounds. To each character is attached but one sound. We first begin by teaching the children to recognize the forms of the small letters, and their appropriate sounds. For this purpose we use both the large and small cards, and the blackboard.

The teacher makes the short * sound of *a*, and asks the children to imitate her. This is continued until they are able to do it with some degree of accuracy. She then holds before the class a small card with the small letter *a* on it. She asks one of the class to select another like it from the table, calling upon the class to decide as to the correctness of the selection. Asks another to point to a form like it on the large card. Lets other members of the class select other forms like it on the card and on the table. Teacher makes several letters on the board; the children decide when she makes this letter. Different members of the class are called upon to select as many letters of this kind from the table and card as they can find, always repeating the sound as they select them.

* The short sounds of the vowels, as heard in hat, pen, pin, hot, hut, the hard sounds of *c* and *g*, the sound of *x* as heard in WAX, are used in every case in this Step; and *s* has the sound of *c* soft, as heard in sent. The letters *k*, *q* and *s* are omitted. The *names* of the letters are not given to the children at present.

11. The long sound of *u* is expressed by *u*, and by

ue	*ui*	*ew*	*eu*	*ieu*	*iew*	*eau*	*ewe*
blue	suits	blew	feudal	adieu	view	beauty	ewe
glue	juice	mew	neutral	lieu			
sue	sluice	Jew	feud	purlieu			

12. The short sound of *u* is expressed by *u*, and by

o	*ou*	*oo*	*oe*
come	rough	blood	does
done	touch	flood	
dove	young		

13. The middle or obtuse sound of *u* is expressed by *u*, and by

oo	*ou*	*o*
book	could	wolf
good	should	woman
took	would	bosom

14. The short *u* before *r* is expressed by *u*, and by

e	*i*	*ea*	*o*	*ou*	*y*	*ue*
her	girl	dearth	word	adjourn	myrrh	conquer
defer	twirl	hearse	worm	scourge	myrtle	masquerade
prefer	mirth	yearn	worth	journey	myrmidon	

15. The sound of *ow* is represented also by *ow*, as *howl, vow, allow.*

16. The diphthong *oi* is otherwise represented by *oy*, as *boy, coy, toy.*

17. The sound of *hw* is represented by *wh*; as, *when, whip, whim*, &c.

DICTATION.

INTRODUCTORY REMARKS.

IMPORTANT as it is that every one attempting to write in English should be able to spell correctly, it is but too manifest that the painful exercises to which children in former years were subjected failed to give them the power of doing this. The learning by heart of column after column of spelling lessons, in which many words not in common use would constantly occur, as well as many others in which the combination of letters is quite arbitrary, exercising only memory, has proved, to a great extent, a wearisome waste of time. This plan of instruction is now happily superseded by dictation lessons, which, when rightly given, call out close observation, and thus tend to fix the correct spelling of words in the mind.

FIRST STEP.

Object.—At this step dictation may be considered an exercise in writing. The children first learn how to print letters which are simple in form, as *i, t, n*, and to join them together, so as to make words of two letters.

Plan.—1. The teacher to print a letter—the letter *L*, for instance—on the board, the children being required to observe carefully how it is done, to say what kind of lines are made, and also their direction, a simple definition being sufficient. The children to observe, further, where the teacher begins the formation of the letter, and where the formation of it ends. The teacher then

makes a second letter, *O*, and joins it to the first, directing the children's attention also to the mode of its formation. The children to say what word is made.

2. The teacher to print the same word very slowly two or three times over; to require the children to observe closely, and to imitate the act by moving a finger as if writing in the air.

3. The teacher to require two or three children to print the same word on the board, to compare the word they have printed with the copy, and to say in what they are alike, and in what they differ, and how they could be improved.

4. The children may then print the same word three or four times over on their own slates, the teacher seeing that the copy is constantly referred to, and also carefully and frequently examining the slate. As improvement in writing mainly depends upon the children attentively observing the copy, and comparing their own work with it, the teacher should occasionally print on the board an imitation of one of the children's productions—either a very good or a very bad one; the rest of the children to say in what the letters are rightly or wrongly formed; then to look at their own slates, and see to which their own copy bears most resemblance.

SECOND STEP.

Object.—There are three points in which this Step is in advance upon the First Step: 1. The children are led to observe the proportion between the different parts of letters; and 2. The position of the words printed on the slate. 3. They are taught to hold the pencil properly.

Plan.—The teacher gives a word, the children spell it; then this word is printed on the board, as in the First Step. The children are then led to observe the relative position of the letters, their size, and the proportion of their parts. They are directed to begin to print the words at the top of the left-hand corner of their slates, and to continue them successively in a straight line toward the right. They are usually led to print such words as occur on the boards from which they read. After the children have printed

two or three words, and these have been carefully examined, these words, as well as those from which they were copied, are rubbed out, and they are required to print the same words from dictation. They are then instructed in the proper mode of holding a pencil, practising this before they commence writing.

THIRD STEP.

Object.—To teach the children to substitute *written* for printed characters. The daily practice of the children in reading the summaries of lessons written on the board, during their object lesson, will assist in preparing them to pass from *printed* to *written* characters. The latter are introduced at this Step, together with the use of the comma and period.

Plan.—1. The two different alphabets are written on the blackboard, and the children exercised in writing the two forms of the same letter on their slates. The teacher next gives out the first word of a sentence, the children spell it, and one of them writes it on the board, being directed to begin with a capital letter; the rest examine the word, saying whether the letters are of the proper height and inclination; any points not noticed by the children to be taken up by the teacher. All the words in the sentence are in succession similarly dealt with.

2. The teacher supplies the stops, and directs the children's attention to their use and their position. The children are required to look at the sentence carefully for two or three minutes, and to notice the spelling of each word.

3. The whole is then rubbed out, and the children write the sentence on their own slates, at the dictation of the teacher. The slates are constantly and carefully examined by the teacher, and faults or excellences pointed out.

FOURTH STEP.

Object.—To lead the children to a more close observation of the spelling of words, especially that of some of the peculiar words

of our language. They are also exercised in the use of capital letters, and of the notes of interrogation and exclamation, and taught the rules which regulate the use of all these. Any dictation spelling book may be used as a text book.

Plan.—This is exemplified in the following suggestions:

1. Words are given, similar in sound, but differing in spelling and signification; as, for example, *all, awl; piece, peace,* &c.

2. Words similarly spelt, but differently pronounced or applied; such as, *close*—shut fast; *close*—to join, to shut; *conduct*—behavior; *conduct*—to lead, to manage, &c., treated in the same way as the former class of words.

3. Words spelt and pronounced alike, but differing in signification; as, *hail*—drops of rain frozen while falling; *hail*—to call out.

4. The children learn the distinction between vowels and consonants, and are made acquainted with a few simple rules of spelling; as, for example, under what circumstances a consonant is doubled, as in *beg, begging, run, running,* &c.; when one *l* is to be omitted, as in *almost*, made up of *all* and *most; skilful*, made up of *skill* and *full*. During these lessons, the capital letters and different stops are used.

The following plan may be adopted when the lesson is on words similar in sound, but differing in spelling and signification:

1. Suppose the words to be *see* and *sea*. The teacher writes *see* upon the board, directs the children's attention to the spelling and meaning (the latter to be written opposite the word); and the teacher asks whether they have heard a word of the same sound used in any other sense? If not, to tell them that a portion of the ocean is called *sea*. This word, *sea*, to be then written under the other, the children to compare the two, to say in what they are alike and in what they differ, and to give the meaning of each:

See—to look.
Sea—part of the ocean.

2. The teacher to dictate the sentence, "I can see the sea;" to require a child to write it upon the board; the rest of the children to examine the sentence, and especially the spelling of the two words, *see* and *sea*, and to say whether each is spelt correctly; why, in that particular sentence, the last word is spelt *sea*, and not *see*.

3. The teacher to dictate two or three sentences containing both these words; the children to write them on their own slates. After each sentence is written, all the slates to be examined by the teacher. If the teacher meets with a sentence in which the two words are not spelt correctly, to copy it on the board, and submit it to the inspection of the class. When they have decided where and what the error is, they are to examine what they have written on their own slates, and, comparing it with that on the board, make the necessary corrections.

COURSE OF LESSONS ON ANIMALS.

INTRODUCTORY REMARKS.

THE natural history of the animal creation furnishes abundant materials for instruction. First, that of a religious character; for the wisdom and goodness of the Creator are manifestly proclaimed in the wonderful construction and beautiful adaptation of animals to circumstances, evidencing design in a manner which no one can gainsay. Secondly, that of a moral character; for, by awakening interest in animals, kind and humane feelings are promoted, which those who have witnessed the pleasure even very young children take in tormenting creatures over which they have any power, will acknowledge to be an object of no small importance. Thirdly, that of an intellectual character; for the faculties of observation, of comparison, and of conception, are brought into exercise, whilst reason takes its part in tracing cause and effect, and drawing inferences and conclusions from facts.

In the First Step, the perceptive faculty is exercised on the general appearance and external parts of animals. The teacher must not seek either to promote precocious development, or to store the memory with information, but simply to direct aright the activity that exists; to form, and not to fill the mind.

In the Second Step, not only the perceptive, but also the conceptive faculty is exercised. The teacher directs attention to the actions of animals and their mode of life, as well as to their forms, parts, &c. Subjects of lessons are no longer limited to native and domestic animals, but include such as are foreign; at least the more prominent of these.

In the Third Step, the reasoning faculty is exercised. The teacher leads her class, already somewhat acquainted with the structure and habits of animals, to see the wonderful adaptation of one to the other. Sometimes this is best shown by comparison of individual animals.

In the Fourth Step, the faculty of generalization is exercised. The work of the last Step, which is consideration of adaptation, is extended to classes of animals. More general comparisons are made.

Moral lessons should constantly be drawn from these subjects, not with cold, dry formalism, but in such a manner as to interest and to improve. In the lower steps, the object of the teacher will be chiefly to excite feelings of humanity and sympathy for the lower animals. In the higher steps, the thoughtful teacher cannot help referring to the wisdom and goodness of the great Creator and Adapter.

All that can be done to help teachers in carrying out this subject, is to furnish them with principles, give a few patterns of model sketches and exercises, and to suggest hints. But if the mind of the teacher be barren and uninventive, the instruction will be dull and wearisome.

FIRST STEP.

I.—General conversation about an animal. Observation of its most prominent parts, as the children advance.

II.—More accurate observation; referring to,

1. Parts, names, and number and uses of these.
2. Distinction of parts, as principal and secondary.
3. Position of parts.
4. Characteristic parts, or those which especially distinguish the animal.

Any one or two of these points may be taken up in a lesson, as the subject may be best adapted to work them out. But as a general rule, the teacher will commence the Step by working out Point 1, and conclude it by working out Point 2.

In preparing students to teach this subject, the teacher of Method may begin by directing their attention to the pattern lesson on the "Hen and Chickens."

Let them examine the sketch, note what ideas are taken up, in what order, and form a corresponding lesson on the "Cat and Kittens."

1. *Hen and Chickens.* (*Conversational Lesson.*)

1. Present a picture. Let the children examine it, and determine what the animals are; what doing; what the hen is to the chickens; the chickens to the hen; what the hen does for the chickens (scratches up food for them all day, watches over them, defends them from any dog or hawk that threatens them). This gives her trouble, and exposes her to danger. Why she does it? She loves her chickens. Children to say what their mothers do for them, and why? Refer to the goodness of God, which inspires mothers with so much affection.

2. Children compare the hen and chickens as to their ways, &c. The hen is active, industrious, intent on supplying the wants of the chickens. The chickens are weak, helpless, and can do nothing for themselves. How they act on the approach of danger. How the hen behaves under the same circumstances. How loving she is; how brave; how unselfish. How we should feel and behave toward the hen.

2. *The Horse.* (*For Parts, their Names, and Number.*)

MATTER.	METHOD.
1. A horse has legs, body, head, eyes, ears, mane, tail, and hoofs.	1. Children name the parts when pointed to, and point to them when named. (S. R.)
2. A horse has a long round body, long thin legs, a handsome flowing tail, flowing mane, and upright pointed ears.	2. Children led to talk about the parts; their number and kind. Teacher gives terms required to express ideas; as, *handsome; flowing*, by comparing the tail and mane of the horse with the tail and mane of the lion. *Pointed*, brought out by comparing the two ends of a cut pencil. Which end most resembles the ears of a horse? *Upright*, by holding the pencil in different directions.
3. The horse has one head, one body, one tail, two eyes, two ears, four legs, and four feet.	3. Children referred to the parts they have before noticed. Teacher bids them to name some part of which the horse has but one; some part of which it has two; whether they can find any part of which it has exactly three? If not, let them find parts of which it has four.
4. We should never treat the horse unkindly, but always be good and gentle to it.	4. Children say who made the horse. How He would like to have us treat it? To name any ways in which they can show it kindness.

Summary.—Teacher asks each child individually to name a part of the horse. Goes around the class a second time, asking each the number of part he names; *i. e.*, the child who says, "The horse has an eye," should say how many eyes. Third time each child is required to describe any part named by the teacher.

Students in training to construct a sketch on "The Mouse," as "The Horse."

3. *The Sparrow.* (*Parts.*)

I.—Principal and secondary parts. II.—Position of parts.

I.—1. *Principal Parts.*—These are, *head*, *body*, *wings*, and *legs*. (S. R.) Call on a child to touch a large part of the bird. When body and wings have been found, cover them up, that the remaining parts may be ditstinguished.

2. *Secondary Parts.*—(*a*) Of the head—*eyes* and *beak*. (*b*) Of the body—*feathers*, *back*, *breast*, and *tail*. (*c*) Of the legs—*feet* and *claws*. (S. R.) A child to find a part of the head; as, the *eye*. How many eyes? What the bird does with them? The *beak*. How many parts? Its use? What children have, instead of a beak? What, instead of the feathers? Why the bird wants feathers? &c.

II.—*Position.*—1. Principal. The *head* is at *one end* of the *body;* the tail at the *other end*. The wings *are on either side*, and the legs underneath. (S. R.)

2. Secondary. The *eyes* are on *either side* of the *head*. The beak is in front of the head, and below the eyes. The back is the *upper part of the body*, the breast *the under part*. The feet are *below the legs*. The toes are at the *end of each foot*—three before, and one behind. The feathers are all over the bird, except the legs, beak, and eyes. (S. R.) Children to notice where the head is. Teacher give the proper expression, if needed. Question thus: What is at one end of the body? What at the other? Then reverse the questions; as, Where is the head? Where are the legs? the feathers? Children distinguish the unfeathered parts.

Students in training construct sketch on "The House-fly," as "The Sparrow."

The teacher, having led the class in training to decide on the characteristic parts which are written on the board, requires them to supply the method.

4. *The Duck.* (*For Characteristic Parts.*)

MATTER.—1. The duck has feathers of many colors—green, blue, brown, white, and black.

2. The duck has thick, glossy plumage.

3. The duck has a flat, boat-shaped body.

4. The duck has strong yellow legs, placed far back.

5. The duck has broad, webbed, yellow feet.

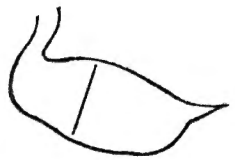
6. The duck has a broad, flat-toothed, yellow bill, rounded at the end.

METHOD.—1. Let children select colored cards to match the feathers of the duck, and name the colors.

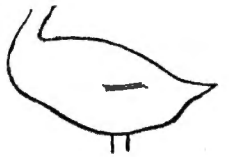
2. Unless there is a stuffed specimen, and not merely a picture, omit this. With a specimen, bring out *thick*, by observation, and *glossy*, by comparison with the feathers of an owl.

3. Present a card-board cylinder. Children bend it so as to represent the general shape of the body. Give term *flat*. Draw an oblong to represent shape, and ask what object they see on the water nearly of the same shape?

4. Measure the diagram from end to end. Mark it in the middle.



Children to mark where the legs are placed.



5. Compare with feet of a hen. Give the term *webbed*.

6. Compare with the beak of a hen. Give the term *toothed*.

Summary.—Teacher names the parts. Each child in turn gives a term which describes the part named.

Students may construct a sketch on "The Hen," as "The Duck."

Subjects for Lessons at this Step.

A Dog.
A Cat.
A Cow.
A Sheep.
A Horse.
A Goat.
A Hen.
A Cat and Kittens.
A Cow and Calf.
A Sheep and Lambs.
A Donkey in Draught.
A Pig.
A Duck.
A Hen and Chickens.

A Cock.
A Rabbit.
A Mouse.
A Newfoundland Dog.
A Mare and Foal.
A Goose.
A Rat.
A Guinea Pig.

SECOND STEP.

I.—Characteristic Parts continued.
II.—Mode of Life.
1. Habitation.
2. Food.
3. Actions; especially characteristic actions, including Sounds.

III.—Disposition; involving special traits of character or intelligence. Lessons of this kind are best worked out by anecdotes. Moral lessons should be derived from them.

IV.—Uses of the animal, living or dead; our duties with respect to it. The uses to be considered are those which have direct reference to man. The uses of animals in the economy of Nature is a subject in advance of the Step. When the lesson is on a domestic animal, it should not close without asking the children what they can do for the comfort and pleasure of the creature.

V.—Comparative size.

As was the case in the First Step, any of these points may be taken as the subject of a lesson. Thus: In the first exercises, we have Characteristic Parts and Actions, with Uses; in the second, Sounds; in the third, Characteristic Parts and Traits; in the fourth, Form, and Use as depending on the food of the animal; in the fifth, Mode of Life. The same, or other animals, would be chosen to bring out the remaining points.

The teacher of method, in commencing the Step, may begin with a pattern sketch on

1. *The Cow.*

I. *Parts.*—Bring a picture of a cow before the children, who,

after describing its general appearance, according to the picture, point out what distinguishes the cow from other animals: A square bulky body, thin legs, broad head, curved horns, straight back, rounded sides, dewlap, covering of short hair, long slender tail with a tuft at the end, and cloven hoofs. (W. B.)

II. *Actions.*—Let the children mention *anything* a cow can do; then leave them to make out a list of actions proper to a cow. Gathering the grass together with the tongue when feeding; chewing the cud, lying down meanwhile; tossing with the horns; kicking; lashing its sides with the tail; whisking off flies wth its tail; lowing; bending the fore legs first in lying down; standing in the water. Children to say under what circumstances each of these actions is performed.

III. *Uses.*—Children find out all the uses of the cow. She gives milk; we eat her flesh; in some countries used for the plough and for the draught; her hair is used in making mortar; her hoofs make glue; her horns to make cups and knife handles; her fat to make tallow. Children say in what ways the cow is useful while living, and when dead. Who gave us this useful creature? How we ought to treat His gift? What the cow likes? What she ought to have? &c.

Students in training may construct a sketch on "The Dog," as "The Cow."

Exercises on this pattern should be continued until the students can readily select and arrange the points each involves. "The Pig," "The Elephant," "The Cat," "The Lion," "The Robin," and "The Ostrich," are good subjects.

2. The following general directions, involving the heads of an exercise on the Sounds of Animals, are given, to which the students may supply the Matter and the Method:

HEADS.—I. Enumerate sounds made by different kinds of Birds. Draw a general conclusion from a consideration of these.

II.—Enumerate sounds made by different kinds of Beasts. Draw general conclusion.

III.—Enumerate sounds made by Reptiles. Confine your attention to the sounds made by vertebrated animals.

Students in training construct sketch on "Sounds of Insects."

3. *The Parrot.* (*Characteristic Parts. Characteristic Traits.*)

1. Children determine how they know a parrot. By its green or gray plumage, with a mixture of red; its curved and curious beak, the upper part loose; its strong legs; the arrangement of its toes—two before, and two behind; also by its power of learning to talk.

2. Children name the birds that can be taught to speak: Raven, magpie, daw, jay, starling. (W. B.) How birds learn to speak. Whether any one in the list speaks as well as the parrot? How much of what it says does the parrot understand? How children can talk, and learn their lessons, just like parrots? Whether it is right to do so?

Lead children to see that, as God has given us a power of reflection, not possessed by birds, we ought not to speak without thinking.

Students construct a sketch on "The Crow," as "The Parrot."

4. *Lesson on the Sheep.* (*For Uses.*)

1. Form of the animal's body. Large trunk compared with slender neck, and small head. Thick covering noticed.

2. Uses of the animal to man for food and clothing.

3. Food of the animal—grass, that grows plentifully everywhere, even on the tops of high hills, where corn will not grow.

4. The blessing this animal is to man. The goodness of God in giving it to him.

5. What the sheep likes. What we can do for it.

Students may construct a sketch on "The Ass," as "The Sheep."

After a sufficient number of individual lessons, a more general lesson may be given. In the one that follows, the Matter is given, that the students may write out the Method:

5. *Animals.* (*Mode of Life.*)

1. Where living?
2. How moving?

MATTER.—1. God made animals and plants. He made the animals to move about, and the plants to keep in one place.

2. God made some animals to live and move in the air, some on the earth, and some in the water.

3. To those animals that live in the air, God gave wings, and they fly; to those that live in the water, He gave fins, and they swim; to those that live on the earth, He gave feet, and they walk.

Comparative Sizes of Animals.

As the Natural History prints are not constructed at all with reference to their comparative sizes, to guard against any wrong impression that may be formed by the children, it is well to call their attention to this point.

For this purpose, it is desirable to have a chart to show this, such as those sold by the Home and Colonial Institution.

The teachers of the children may exercise them in finding:

1. Ten of the largest animals.
2. Ten of the smallest animals.
3. Six not so large as the first ten, nor so small as the second ten.
4. Ten animals of various sizes, to be arranged in order, beginning with the largest.
5. The same, beginning with the smallest.
6. Animals nearly the size of a horse; as, cow, bear, &c.
7. " " a sheep; as, goat, &c.
8. " " a cat; as, rabbit.
9. " " a rat; as, guinea pig.
10. " " an elephant; as, the rhinoceros.

It were better, perhaps, that the lessons on size should not come in series. They will make an agreeable variety if interspersed with other lessons on animals. In each lesson, as the animals are chosen, their names should be placed on the board.

When the children can readily give examples from the chart, they may be required to do so from memory.

Subjects for Further Lessons.

All native animals that are familiar, and a few of the more prominent foreign animals, as lion, elephant, &c., may be taken.

Lessons from Scripture Natural History may be included.

EXAMPLES.

Raven,
Serpent,
Camel,
Fish,
Dove,
Lion,
Ass,
Sheep,
Bee,
Eagle.

} See Religious Instruction, Part 2.

THIRD STEP.

In this Step the instruction is more systematic than in the former ones. The teacher selects her subjects from Class Mammalia, with a view to classification in the succeeding Step. Although the attention of the children is not directed to the animals as forming different groups, they are led to trace the gradual change that takes place in their organization; fitting them for different habits, propensities, and localities. The faculty of comparison, as well as that of simple observation, is exercised.

In considering structure and habits with special reference to the adaptation of the first to the last, it is often well to begin with the mode of life, leaving the children to judge as to the kind of structure this renders necessary.

1. *Lesson on the Bat.* (*Point—To Show the Structure of the Wings.*)

1. Bid a child touch different parts of his own body, to lead the rest to distinguish the head, trunk, and limbs. Children state the number of limbs in a man. How terminating? Other animals that have four limbs. How terminating? Generally in feet only. Give the term *quadrupeds*. Whether man is a quadruped? Why not? By comparison with different animals, show that only man has two hands and two feet.

2. Refer to a creature having four limbs, the hinder terminating with feet, the fore formed into wings. Children will think of a bird. May be told that there is such a creature amongst beasts. Produce a specimen. Direct attention to the wing, and explain that an equal number of bones form the arm of man and the wing of a bat. Children to find out the bones in their own arms. (W. B.)

1. From the shoulder to the elbow.
2. From the elbow to the wrist.
3. The hand bones.
4. The thumb bones.
5. The finger bones.

Draw a diagram of the arm, numbering the parts; then a diagram of the bat's wing, numbering corresponding parts, which children observe and compare.

1. Longest bone in man; shortest in the bat.
2. Shorter in man; *very* long in the bat.
3. Scarcely appear in the bat.
4. In the bat terminating as a nail, serving as a hook.
5. In the bat thin, and extremely elongated, with extended skin between. (W. B., in opposite columns.)

Lead children to observe, that they find no new part in the wing, but an accommodation of common parts to special circumstances. Children to say why the bat has wings at all—(it lives in the air). What its food is. What it can find in the air. Children may examine the beak, and observe how it is adapted

for catching insects. Tell them that at one time of the year the bat seeks the hollow of a tree, or goes into the steeple of a church, because torpid; remains motionless; folds its wings around it, and hangs to some projection by its hook. Children to say *when* this would happen? And why then? Who gave the bat its wings? Whether any one can suggest any improvement? Let children notice the *size* of the wing, extending down the side to the feet. Why a smaller one would not do? Skin—why thin? Why tough? Color—corresponding with the body; appears black at dusk. Why? Let us praise His wisdom, who gave the bat its wings, and of whom we can say, "He hath done all things well."

2. *The Hedgehog.*

MATTER.	METHOD.
I.—1. We will speak of a little animal called a hedgehog. It lives under hedges or in gardens; sleeps during the day; takes its food at night, and becomes torpid in the winter.	I.—1. Information given, where the children fail to supply it.
2. It eats insects, worms, and the soft parts of the roots of trees.	2. From the places which it frequents, children to infer what its food would be.
3. It burrows under ground.	3. Children to say what parts it must have in order to burrow—(snout and claws).
II.—1. The snout is hard and bony; claws very sharp; legs very short.	II.—1. Facts discovered by observation of the specimen now produced. Children judge whether a creature employed in scraping away earth with its claws could act better with long or with short legs. In order to this, let the children imitate the action of scraping, first with the arms stretched out, and then with the elbows bent. They will decide in which way they could work the longer.

2. Its back is covered with spines.	2. Children to say whether the legs are suited for running. How the hedgehog is to be defended from its enemies.
3. When in danger, it presents the spines, and conceals the unprotected parts.	3. Children discover why the spines need not cover the whole body.
4. The tail is very short.	4. Children observe the fact, and, from what they know, find out the advantage.
III.—Summary.	III.—Children give from memory, first, the habits; secondly, parts; thirdly, state how adapted.

3. *Comparison of Cat with Dog.*

I. *Resemblance.*—Both are quadrupeds; have paws and claws; three kinds of teeth; eat flesh.

II. *Differences.*

Structure.

DOG.	CAT.
1. The dog's head is pointed.	1. The cat's head is round.
2. The dog's teeth are large, flat, and rounded.	2. The cat's teeth are small, sharp, and pointed.
3. The dog's claws not retractile.	3. The cat's claws retractile.
4. The dog's hairy covering.	4. The cat's furry covering.
5. The dog's skin with few pores.	5. The cat's skin porous.
6. The dog's legs usually long.	6. The cat's legs short.

Habits.

1. The dog prefers meat in a putrid state.	1. The cat likes fresh meat.
2. The dog eats any flesh he finds.	2. The cat, in a state of nature, eats only what it kills for itself.
3. The dog runs down its prey.	3. The cat watches for and springs on its prey.
4. The dog secures it by teeth.	4. The cat secures it by claws.
5. The dog runs.	5. The cat leaps and climbs.
6. The dog has good scent.	6. The cat has good sight.
7. The dog howls, and, when domesticated, barks.	7. The cat mews.

8. The dog bites when angry.	8. The cat scratches when angry.
9. The dog wags the tail when pleased.	9. The cat purrs when pleased.
10. The dog licks the hand to show affection.	10. The cat rubs the head *against* you.

Children might also distinguish between habits natural to the animal, and habits acquired by domestication, rearranging the matter accordingly.

The three previous sketches on "The Bat," "The Hedgehog," and the "Comparison of Cat with Dog," are given as examples of the manner in which the succeeding lessons may be treated in practice.

MAMMALS.

The Monkey.

First lead the children to describe the monkey, helping them by showing stuffed specimens and pictures, and by bringing to their recollection the living animals they may have seen.

Points to which their attention should be directed: The head approaching in form nearer to that of man than the head of any other animal, in consequence of the mouth projecting but little. The slender, slight figure, adapted to agile motion; the long flexible limbs, terminated by hands fitted for grasping—that is, having four fingers, with a thumb which can be brought opposite to each of them. They are called *four-handed* animals.*

Then their habits. They live in the woods and forests of warm countries; they feed on nuts and fruits; they spring from bough to bough, and from tree to tree, with surprising agility.

Next lead the children to consider how their form and organization fit them for this arboreal life. That they derive the power of springing and rapid motion from their slender, flexible limbs; and their facility in grasping from the form of their limbs and teeth, aided often by the tail.

Consider next their disposition; cunning, intelligent, ridiculously imitative, lively, restless, chattering, and quarrelsome.

* Quadrumana.

In conclusion, lead the children to infer from the facts brought out in the lesson, viz., that the monkey dwells among trees; is peculiarly fitted for springing and grasping, and for feeding on hard vegetable food, that the Being who made it, and fixed its habitation, is as benevolent and kind as He is powerful and wise; that *He* is *our* God, and we are His creatures.

The Orang-outang.

First, its general appearance and form. It approaches nearer to a human being, in form and attitude, than any other animal, and can maintain an erect posture, though, owing to the different position of its hinder limbs, and the fact of its extremities being better fitted for prehension than support, it walks with difficulty.* The fore limbs are of a great length, the hinder limbs shorter, all slender and flexible, and, from the peculiar construction of the joints, possessing great freedom of motion. The skin, except that of the face and palms of the hands, is covered with long, coarse hair. They are less noisy and tricky than monkeys, but equally intelligent and sagacious.

The monkeys of America might form the subject of a separate lesson. They are remarkable, as possessing in their cheek-pouches a most singular provision for enabling them to keep a store of food; and in their long, prehensive tails, by which they can maintain the firmest grasp. With these they also link themselves together in a chain, and when they wish to pass to trees at a distance, they swing this chain with a sudden jerk, so that the last of them catches hold of the tree they wish to reach. Their throats also are curiously formed, enabling them to utter a most terrific yell. They often assemble together in great numbers, and join in a tremendous howling.

In conclusion, the children should give a description of the monkey; pointing out in what it resembles man, and in what points he is altogether its superior.

* In such short sketches as these the *subject* only of the lesson can be suggested. The teacher must get up the information required, and collect illustrative anecdotes from books, such as "The Class Mammalia," published by the London Tract Society, and "the Menageries" of the Library of Entertaining Knowledge; also Smellie's "Philosophy of Natural History."

The Mole.

After a few questions to arouse the children's recollection of the characteristics of the animals already examined, they may be told, if they do not know the fact, that the abode of the mole is under ground. What, then, should we expect as to its conformation? That it is fitted to burrow in the earth, and to live under ground. What organ fits the monkey for its life amid trees? What limb of the bat did we find accommodated to flying? What enables the hedgehog to burrow in the earth? In what very different places have we found animals living? In trees, in the air, under ground. Which organ is changed to fit each animal for its peculiar mode of life?

If, then, we would see that the mole is fitted to make its way under ground, what ought we especially to examine? Let the children examine the animal, and describe anything they see. Let them observe the beautiful adaptation of the fore limbs to the work of digging and boring, and lead them to admire this. This extremity is broad, strong, and spade-like in shape, being scarcely divided into distinct fingers. It is placed obliquely, so that the inner edge is the lowest, thus forming a complete instrument for throwing the soil behind the animal as it proceeds in its excavations. The arm on which this hand is placed is thick, strong, and muscular. How beautifully is all this contrived for a little mining animal! Continuing the examination, we see other adaptations no less admirable than these. The head is pointed; the end of the snout is bone rather than gristle; the body is of a conical form, and the chief strength lies in the fore part. The animal is covered with a close, soft, velvety fur, which does not impede its progress while burrowing, and which does not retain the wet and mud. As the mole works in darkness, it therefore needs but little sight; and we find its eyes are small, and are protected from injury by the fur which surrounds them. It is directed in the pursuit of its prey, and in escaping from its enemies, by the senses of smelling and hearing, both of which are very acute. Thus, by an adaptation of the same organ which in the monkey is a perfect hand for grasping, and in the bat a wing for flight, the mole is

fitted by its Creator to live under ground. But why should its habitation be under the earth? It finds there the food on which it subsists, viz., worms, and the grubs of various insects. It belongs to the class called *insect-feeders*,* and, whilst satisfying its own cravings, it also renders essential service to the farmer, by clearing the soil of creatures that might injure his crops.

Under the mole-hills, which are often so abundant in fields, are the nests of the mole. These are of a conical form, and, being carefully lined with vegetable fibre, are made most comfortable for its young, which are reared with great care and tenderness. There are always several galleries leading to the nests, which furnish roads of egress and ingress.

How beautiful an instance does this animal afford of the wonderful instinct implanted in animals, to guide them in the preservation of life! Remark to the children that God has given to every animal just the particular organ that it needs. The bird has wings, and flies; the monkey has four hands, and grasps the trees. Animals do that which God intends them to do. What lesson does this teach us? To use aright that which God gives us. Animals know not who gave them the organs which are so necessary to them, but we do know who made us. What, then, is our duty? To praise and bless God.

The Bear.

First call upon the children to state what organs undergo a change to adapt each animal to its peculiar locality and varied propensities, and then let them describe the changes they have already traced. Present them with a picture of a bear. Call upon them to describe its general appearance—it is thick, clumsy, and shaggy, with short limbs and a lazy gait. Now in these respects it is very different from the animals upon which they have had instruction. Draw from them all they know as to the habits of the bear. Let them examine especially the organs connected with the procuring of food, and consequent preservation of life. They should observe the manner in which the bear places the

* Insectivora.

entire sole of the foot on the ground, in which it differs so much from the cat tribe, and by which it is enabled to maintain an upright position. Such animals are called, from their mode of walking, *plantigrade*. Do we use our feet thus when we run? No. When we run, we move on our toes. At what pace do we proceed when we place the entire foot on the ground? Of what character, then, must be the motion of the bear? Might we expect a slow-moving animal to feed on vegetables, or on animals? The bear feeds by preference on vegetables, such as roots, leaves, and berries; it is also very fond of honey; and only when these fail, has it recourse to animal food. Its claws are strong, blunt, and well fitted for climbing trees, or for digging. It is found in northern countries, chiefly in forests or inaccessible rocks, and in solitary places. While the double teeth of animals feeding on insects are pointed, those of the bear are obtuse. During the winter season, the food on which it subsists entirely fails. What usually happens under such circumstances?

But when that all-wise and gracious Being who rules over all creation, fixed the bounds of this animal's habitation, He made provision to meet this periodic failure of his food.

What occurs to the bat under similar circumstances? In the same manner the bear also falls into a deep sleep, during the continuance of which it is insensibly nourished by the fat in which it is incased. When in the spring it rouses from its slumber, it issues forth from its cave thin and gaunt, and so ravenous that it will face whatever falls in its way.

Recapitulate the peculiarities that distinguish the bear and adapt its structure to its special propensities, and to the situation it occupies.

The Bear—(continued.)

The polar bear may be the subject of a second lesson, and the children may be led to see in what it differs from the brown bear, especially in its color, which is white, with a tinge of yellow; and also in the form of its body, which is much elongated; and in what manner its immense paws, covered underneath by coarse hair, give it security in walking over the slippery ice; and that

the layer of fat in which it is incased is the best covering for preserving it from the injurious effects of the cold of a polar region. It feeds of necessity almost entirely on animal food, such as the whale, the seal, the walrus, and fish. It is an excellent swimmer.

Bears are very remarkable for maternal affection. The following history, related in one of the polar voyages, develops this trait in their character, and may be made use of by the teacher to illustrate the affection bestowed on the children themselves by their own mothers; the trouble, anxiety, and pain they undergo, and the return of obedience and love which such affection claims:

Early one morning the man at the masthead gave notice that three bears were fast making their way across the ice to the ship. They had no doubt been invited by the scent of the blubber of a walrus, which had been set on fire, and was burning on the ice. They proved to be a she bear and her two cubs. They ran eagerly to the fire, and drew out from the flames part of the flesh yet unconsumed, and devoured it voraciously. The crew from the ship threw out great pieces of the flesh of the walrus. These the old bear carried away singly, laid each piece before her cubs, and dividing them, gave to each a share, reserving a very small portion for herself. As she was fetching the last piece, the sailors levelled their muskets at the cubs, shot them both dead, and wounded the dam in her retreat, but not mortally. It would have drawn tears of pity from any but savage hearts, to have witnessed the affectionate concern manifested by the poor beast, in the last moments of her expiring young. Though she was sorely wounded, and could scarcely crawl to the place where they lay, she carried the lump of flesh which she had fetched, as she had done others before, tore it in pieces, and laid it before them; and when she saw that they refused to eat it, she placed her paws first upon one, then upon the other, and attempted to raise them up: all the while it was piteous to hear their moan. Finding that she could not stir them, she went off, and when she had got to some distance, she looked back and moaned; and that not availing to entice them away, she returned, and smelling around them, began to lick their wounds. She went off a third time as before, and having crawled a few paces, looked again behind her, and for some time stood

moaning. Finding at last that they were cold and lifeless, she raised her head toward the ship, and growled her resentment to their murderers, which they returned by shooting her dead. She fell between her cubs, and died licking their wounds."

The attachment of the bear to her cubs, and her wrath when deprived of them, is often alluded to in the Scriptures. In Hosea xiii. 8, the Lord threatens to meet his people who had forsaken him, "as a bear bereaved of her whelps." There is a similar allusion in 2 Samuel xvii. 8: "For, said Hushai, thou knowest thy father and his men, that they be mighty men, and they be chafed in their minds, as a bear robbed of her whelps in the field."

A Weasel.

The recapitulatory questions may be put in the following manner, with a view to variety in the mode of presenting the subject to the children. This is very important, as a means of keeping up interest, and giving more exercise to the mind.

What animals have you found fitted to live amidst trees? What kind of animal is suited to chasing its prey in the air? What change in the formation of another animal renders it a good miner, and suited to feed on insects? What kind of feet are best adapted to a heavy, slow-moving animal? Would such an animal be able to pursue its prey? Of what nature, then, may we expect to find its food? But we now come to a bloodthirsty, flesh-eating race, of which the first family live upon vermin and poultry; they must therefore be able to creep through very small holes, to thrust themselves into crevices, to crawl under fences, and sometimes to climb heights. The children should endeavor to conceive what description of body and what organs would adapt these creatures for such habits and propensities. Who ordained their food to be of such a kind, and gave them the desire for it? What, then, may we be sure of, as to their particular formation?

By such questions as these, the children may be led to see that animals with propensities such as are implanted in the weasel, need a slender, light, flexible, yet powerful body, with a small tapering head, and short limbs armed with claws. Let them observe that

such is the form of the weasel tribe, by the actual examination of a stuffed specimen or a picture. Prompt them to call to mind any creatures they may know that force their way through the earth, or wind about through the grass, and under stumps and fences. What is the form of worms, and what their peculiar motion?

The weasel, and other animals of this tribe, are called *worm-shaped*,* from their resemblance to worms in shape and movement. Their limbs are short and strong; and instead of placing the entire sole of the foot on the ground like the bear, they walk on their toes.† This fact having been told them, the children should themselves draw the inference, that their step is consequently free, light, and active. Their bodies are so tapering and flexible, that they move with grace and rapidity. Their teeth, being pointed, are fitted for seizing and tearing their prey. They all emit a very unpleasant odor. We find that their disposition is bloodthirsty, and that their form and organs are adapted to the gratification of these propensities. Then, by similar instances of the form and organization of animals being suited to their several habits and propensities, of which the children themselves may remember several, lead them to the conclusion, that in God's works all is harmony.

There is another point to which attention should be drawn, viz., the providence of God in the creation of a race of animals, which, while satisfying their own appetite, prove useful to man by preventing the excessive increase of vermin that by feeding upon grain do farmers so much injury.

The Stoat.

The children should compare this animal with the preceding one, and point out any features in which they are alike, or in which they differ. The stoat is larger than the weasel, and is especially distinguished by the changes that take place in its fur as winter approaches. In summer this is of a reddish brown; but in those animals which inhabit northern countries it becomes of a pure white in winter, except the tip of the tail, which is always

* Vermiform.

† They are called *digitigrade*, or *movers on the toes*.

black. Why this change? One reason is, that the gracious Creator thus enables this creature to escape observation when the ground is covered with snow. The change has also another advantage; for its white coat enables it better to resist the intense cold of Siberia, as the heat of its body does not pass off so rapidly as it would if its color were dark. (The children may not understand the reason of this, but the fact is very interesting.) Another provision for its comfort is, that the fur becomes thicker in winter. Man, being possessed of reason, is able to provide for the changes of seasons; but God administers more immediately to the necessities of the brute creation.* The fur of the stoat is called *ermine*. It is considered very valuable, and forms the robes of kings and nobles. The hunter seeks it in the winter season. Why? The facts on which the answer to such a question depends have been already told the children.

The Ferret.

The children should describe the animal, its slender, worm-like body, short legs, sharp claws, pointed teeth, and piercing eyes, and then determine to which of the animals already examined it bears the most resemblance. They should state any differences they perceive, and be led to infer, from the similarity of the organs and form of this animal to those of the weasel and stoat, that its habits and propensties must be similar to theirs. The sanguinary disposition of this creature is turned to account, in using it to clear our premises from vermin; but though employed and domesticated by man, it seems quite incapable of attachment to its owner.

The Sable.

This digitigrade, vermiform, carnivorous creature, is interesting from the high value at which its fur is estimated.

The sable is found in the forests and mountains of Siberia; and owing to the extreme cold of this icy region, and the fact of the

* The children may be led themselves to notice such facts. They know that man has reason, and animals instinct, and they will be able to see the reason for this different provision.

chase being generally pursued in winter, the fur of the animal being most thick and rich at that season, the poor hunter is exposed to extreme peril, and often perishes amidst the pathless wilds. The chase of this animal is a punishment imposed on the exiles of the Russian Government, who are required to furnish a certain number of skins annually.

Points of interest to which the children's attention may be directed: The beautiful provision made for the necessities of this animal by a beneficent Creator, in the thickening of its fur in the winter season, and in the continuation of this covering to the extremities of the toes; and also the fact of man being able to appropriate such animals to himself so as to derive advantage from them.

As a summary, the children should describe whatever is common in the habits and organs of this race of animals. They should also remark upon the office they perform in nature.

DOMESTIC DOGS.

Spaniels.

The children should again examine the picture of the varieties of dogs, and then endeavor to make out what peculiarity distinguishes the spaniel from others of its race. It has a long head, with a pointed muzzle; its ears are soft, long, and pendent, fitted to gather the sound of footsteps from the ground; its hair is silky and waving, and either of a red liver color, or black and white; the tail bushy. Its scent is very delicate, and guides it in the pursuit of its prey. It is exceedingly docile, intelligent, and affectionate. Many instances are on record of its attachment to its owner. It has been known to preserve the recollection of its master, and to recognize him after an absence of so long duration that his friends had forgotten him. There are several varieties of the spaniel. Some, as lap dogs, are very small; others are larger, and are employed in field sports. One species, from its mode of marking its prey, is called the *setter*. The following account well describes the characteristics of this dog: "A setter dog should be a

fine land spaniel that will range well, and yet at such absolute command, that when he is in full career, one 'hem' of his master shall make him stand still, gaze about him, and look in his master's face, as it were expecting directions from him whether to proceed, stand still, or retire. But the main thing he is to be taught is, when he sees and is near his prey, of a sudden to stand still, or fall down flat on his belly, without making any noise or motion till his master comes up." What a lesson does such a dog teach children! What is there in this animal they may imitate? His prompt obedience; his desire to please, and to do his appointed work; his self-denial, giving up his own pleasure to that of his master.

The *pointer* is another dog also employed by the sportsman. It resembles the spaniel, but it has less hair, nor is its hair waving. This dog is trained to stop and to point to the spot where game lies hid. Its natural instinct is to approach its prey stealthily, and then, pausing for an instant, to spring upon it with an unerring aim derived from this pause. Education has converted this short rest and rapid spring into a fixed and deliberate rest, which has been thus quaintly described: "This semicolon in his proceedings, man converts into a full stop."

The dogs called *hounds* are used in hunting the deer, fox, hare, and otter. They are keen of scent, and are kept in numbers, called a *pack*. Their fleetness is so great that the swiftest horse alone can keep pace with them. The tone of their cry is deep and mellow, but the neighborhood of a dog kennel is not very agreeable, as they make a sad howling when fed. The feeding of a dog kennel furnishes a proof of the complete obedience to which these animals can be trained. They are hungry, and know that they are about to be fed, but they manifest no rebellious impatience. The feeder stations himself at the door which separates the outer kennel from the feeding room. On his arrival, a cry of joy is set up by the whole pack, but it is instantly silenced at his command. He calls, 'Juno'—Juno passes out; 'Ponto'—Ponto follows; and so on through the pack, even should there be as many as thirty couples. If a young dog should attempt to move out of his order, he is sent back; he recollects his punishment, and seldom transgresses again. The pack is brought to this state of perfect discipline by gentle correction."

The *greyhound* is remarkable for the great beauty and elegant lightness and symmetry of its form, peculiarly fitting it for fleetness and agility. Its head is very pointed, ears short and erect, but pendent at their tips. Its limbs are slender, its body thin, and standing high; its fur smooth, with short hairs. In disposition it is gentle and affectionate. It is principally used in hunting the hare, which it pursues chiefly by sight, not having so keen a scent as other dogs of the chase.

The *terrier* is another of the sporting dogs. Two of these dogs usually accompany the fox hounds. They are also most useful in catching rats. The terrier is a thick-set, brisk-looking animal, with rather short legs, its muzzle not projecting so much as that of the spaniel. Its short legs enable it to creep under the grass and through brakes and bushes. There are two species: one, the Scotch terrier, has very rough and wiry hair; the other has a smoother coat, and altogether is more delicate in appearance. It is supposed that the terrier is the native dog of the British Isles. It is remarkable for the eagerness and courage with which it makes its way into the earth after those animals, from the fox to the rat, which are usually called *vermin*. It possesses great sagacity, and is most daring in its attacks upon larger animals. It is used as a guard to the house, as well as in the chase.

These lessons on the sporting dogs may be useful as exercises for the children in drawing out a description of the various dogs they may see in pictures, or with which they may be familiar, the teacher supplying whatever escapes their observation. They should be led to observe the education these dogs receive, and the improvement it produces, and draw the inference that they should themselves value education, and be thankful for being taught. Not only are the senses of these dogs rendered more acute by their being used in the service of man, but they are also wonderfully trained to forego the indulgence of their own natural propensities, and to use their powers, not for their own gratification, but for that of their master. Their carnivorous appetites would prompt them immediately to devour the animal which their scent

has discovered, were they not trained to obey their master at the sacrifice of their own inclinations.

Dogs—(*continued*).

In what service are those dogs employed, upon which you have had lessons? What organs are most useful in the chase? How would you characterize their motion? How are their feet adapted to fleet motion? Why, for instance, can they run more swiftly than the bear? In what respect are their bodies better fitted for motion than that of the bear? They are light and slender, and their muzzle pointed. Now repeat together: "The dogs of the chase are fitted for rapid motion by being digitigrade, and by having a light, slender body, and pointed muzzle." What sense is very important in directing their pursuit? How has the Creator wisely provided for this necessity? What do they need in addition to the power of pursuing their prey? The power of catching and eating it. By what organs are these actions accomplished? By the teeth and claws. How are their teeth and claws fitted for seizing and eating animals? What is essential to the life of animals? What is the chief food of dogs? How are they fitted for their flesh eating propensity? What are the lessons which their history affords you? Tell me some other uses of dogs other than that of the chase. They guard our houses, our property, and our lives. Here is a picture of two dogs which are especially useful as guards to our dwellings and property—the bulldog and the mastiff. What do you observe when you compare these with the spaniel tribe? The head is thicker, the muzzle short, and the aspect very fierce. They are bold and ferocious. How does man make use of this disposition? He turns it against those who would injure him or his property. There is another very useful dog, which perhaps some of you may have seen, which is much used in the old countries in watching and guarding flocks on the mountains, and in driving them from one place to another. What dog is this? The shepherd's dog. What does the shepherd's dog do? Yes; he drives the sheep along the streets; he keeps them together, and allows none to straggle. Looking at his

master, he receives his directions, and then faithfully and sagaciously executes his will. The dog you see thus employed in the streets is called a *drover*. The dog that guards the mountain flocks is a much finer animal, and it is very beautiful to see how he can keep a very large flock of sheep within their proper bounds, bringing up every straggler without any violence, and knowing the sheep of his master from those of every other flock. Do you think that it is natural to these dogs to take care of sheep? No. How, then, do they become such a valuable help to the shepherd? You remember what we remarked as to the dogs of chase, how their natural instincts were turned to man's account. What, then, is done, should you think, with the drover and the shepherd's dog? They are educated by man, who teaches them their lesson, and that which they thus learn becomes a second nature to them. How do these dogs carry out the lessons given to them? What virtues do they display? What may children learn from them?

Is the dog useful to the rich only? No; he is also the poor man's friend. Can you tell me how? Yes; he will guard his clothes while he is at work, and will lead about the poor blind man. The following is a remarkable instance of the docility and sagacity of the dog: One of these animals was in the habit of conducting a blind beggar through the streets of Rome. This dog, besides guiding his master in such a manner as to protect him from all danger, learned to distinguish, not only the streets, but the houses where the blind man was accustomed to receive alms. Whenever the dog came to any one of these streets, he would not leave it till a call had been made at every house where his master was usually supplied. When the beggar began to ask alms, and was received, the dog would lie down to rest; but the master was no sooner served or refused, than the dog rose, without either order or sign, and proceeded to the other houses where the poor man generally was successful. When a halfpenny was thrown from a window, the sagacious animal went in search of it, carried it in his mouth, and placed it in the beggar's hat. Even when bread was thrown, he would not take it unless he received a portion from his master's own hand.*

* A story renders the subject under discussion very attractive. There are

The Fox.

The most obvious characteristics of the fox may be discovered by the children; as, its pointed head, its long narrow pupil, and its long bushy tail. They may be told that the shape of the pupil marks it as a nocturnal animal; and they may be led to understand why its eye should be so formed, by considering the effect that light has upon eyes accustomed to darkness, and to admire the goodness which, by thus enabling the eye to contract and take in but few rays of light, provides for the comfort of the animal, and affords another instance of the kind care that the Creator bestows on his creatures.

The fox is distinguished from the wolf and dog by its longer and more bushy tail, its larger head and more pointed muzzle, its long body and short limbs, its triangular ears, and the form of its pupils, which contract under the influence of light to a mere line. The odor emitted by the fox is very disagreeable. The usual length of the animal is about two and a half feet ;* the height, one foot. The color is fawn, intermixed with black. The fox digs out holes under ground, to which our Saviour refers in Matt. viii. 20. It is a cunning, wily animal. In the dusk of the evening it steals from its burrow with noiseless step, to prowl about for prey. Its sense of smell and of hearing are very keen; it listens, and snuffs the breeze, attentive to every sound, and observing every odor. With a crouching attitude† it advances on its prey; it surprises the rabbits gambolling near their burrow, the hare in her form, and the poultry on their perch. It slaughters all it finds; and when its appetite is satisfied, it buries the remainder in the earth, to supply future necessities. It is exceedingly particular in the choice of its quarters. When it has selected the spot for its

many very interesting narratives illustrating the fidelity and sagacity of dogs. The beautiful story of the dog at Bethgelert is well known. There is another in the "Library of Entertaining Knowledge, Menageries," vol. i., p. 79.

* When the children are told the size of an animal, they may be required to mark it on the board; and also when told the color, they may point to some specimen of the color named.

† Attitude marks character. The wolf is bolder than the fox, and is more erect.

abode, it explores the country to see what advantages it may afford, examining every spot likely to prove a safe retreat in the hour of danger. Its excessive suspicion and caution render any new object a source of distrust and inquietude; it is uneasy until it has discovered what it may be, and approaches for the purpose of observation with slow and hesitating step, and by circuitous paths. It passes the day at the bottom of its hiding place, and sallies forth in search of prey during the obscurity of twilight or the darkness of night, gliding along stealthily to surprise the partridge. When it cannot find game, it contents itself with field mice, frogs, and even snails. It is very fond of honey, and its liking for grapes is the subject of a well-known fable, and is also alluded to in the Bible, Song of Solomon ii. 15.

The young are playful, and remain with their parent about four months. She is tender, watchful, and most resolute in their defence. The children may be told these facts, and then be questioned upon them, being required also to draw up from them a sketch of the character of the fox; and to say what in the animal we may imitate, and what avoid.*

There is an instance on record of the great sagacity of the fox. The Earl of Thanet had a seat at Hothfield, in Kent, and another in Westmoreland. At the former place an extraordinarily large fox had been taken, and the earl ordered it to be conveyed to Westmoreland. The following year, in Kent, a fox which had run into the earth was dug out, and declared by the huntsmen to be the very individual that had been taken to Westmoreland. Lord Thanet was incredulous, but having earmarked the animal, it was again removed to Westmoreland. In the following season a fox was killed at Hothfield, which proved to be the one in question, and it is evident that it must have found its way twice from Westmoreland to Kent, a distance of about 320 miles.

The Wolf.

The children should first determine to which of the animals already examined the wolf bears the closest resemblance, and in

* Teachers should especially avoid having one plan for all their lessons. Variety gives interest, and draws out different intellectual powers.

what respect it is like the dog, as in its general form and appearance, its teeth and claws, &c. Which are the organs that mark the habits of an animal? If an animal have claws and sharp-pointed teeth, what might we expect to be its food? And if it feed on animals that it catches, for what kind of motion must it be fitted? How is an animal fitted for pursuing its prey? Let the children then consider the wolf, and say what they think its habits must be. Its claws, sharp teeth, and light, pointed form, indicate that it lives on animals which it pursues. What sense guides carnivorous animals in the chase? The wolf has a very keen scent. Let them compare the erect, forward ears of the wolf, with the thrown-back ears of the pursued hare, and find out the reason for those of the one being directed forward, of the other backward; and acknowledge in this the wisdom and the goodness that fits each animal in every respect for the habits that are special to it. Having determined the points of resemblance between the wolf and the dog, the children should discover in what respect they differ, and so arrive at the characteristics of the wolf. The wolf is stronger and larger than the dog; it possesses great muscular power; its height at the shoulder is about two feet six inches, and about two feet four inches behind; the length, from the tip of the muzzle to the root of the tail, three feet eight inches;* its coat is very rough and coarse, of a grayish yellow color, with a black oblique stripe on the fore legs; its eyes are placed obliquely, and its tail hangs down. In character it possesses none of the noble qualities of the dog; whilst it is ferocious, cruel, and sanguinary, it is also cunning, wary, and cowardly. In former times this animal was the dread and terror of Great Britain. The month of January was then called wolf month, because at that season the wolves, not being able to find their usual food, used to come forth from the forests and attack man. King Edgar did much to rid the land of these pests, by changing the tax levied upon the Welsh into an annual tribute of 300 wolves' heads. In the early settlements of some portions of this country they were also quite troublesome. How thankful should we be that we are not now exposed to such dangers! (The children should draw the comparison, and say what feelings our improved condition should inspire.) There are many allusions in Scripture to the ferocious character and nocturnal habits of the wolf. (See Matt. vii. 15; Ezek. xxii. 27; Acts xx. 29.)

* The children should mark the size on the board.

Though the wolf is in general a solitary animal, it unites in troops for the purpose of securing its prey, and shows its cunning in the stratagems it employs. When wolves attack the deer, which is greatly their superior in swiftness, they arrange themselves in the form of a semicircle, and creeping slowly toward the herd, they either completely hem them in and surround them, or urge them by hideous yells over some precipice in the only direction they leave open to them.

This course may be completed with reference to the list given at the end of the Step.

MISCELLANEOUS SKETCHES.

For the sake of variety, occasional lessons may be given on animals belonging to various classes. Variety secures interest. For sketch on a bird, see "The Ostrich."

1. *Sketch of a Lesson on the Ostrich.*

Adaptation of its structure to its mode of life:

1. The size of the head is adapted to its long and slender neck.

2. The eye, furnished with an additional lid which can be drawn down at pleasure, is peculiarly protected against the intense heat of the sun, and the fine sand of the desert lands in which it dwells.

3. The feathers of the wings, being loose, and not furnished with barblets, aid the bird in running.

4. The great strength of its large legs enables it the better to take those long journeys which it is obliged to travel in search of food.

5. The membrane of the foot, and the pad which it incloses, give this bird lightness and buoyancy, and fit it for its passage over sandy deserts.

6. The pad on the breastbone constitutes a safeguard against injury from any hard substance when the bird is resting on the ground.

The lesson should conclude by drawing the proper inference from such complete adaptation of organs to the peculiar wants of the bird.

Birds, as a class, are referred to the Fourth Step. It would prolong the Third Step too much, did it include a full course on birds as well as on mammals.

Moreover, children, when they make the advance of a Step, like new subjects, as well as new plans.

A class of students might construct "The Lion," "The Camel," or "The Eagle," as "The Ostrich."

2. *Sketch on a Reptile—The Tortoise.*

1. *Habits.*—The tortoise lives either on land or in water. It moves slowly on the ground, but swims beautifully. It comes on land to deposit its eggs, of which it lays a great number; scrapes a hole in the sand, and leaves them to be hatched by the heat of the sun. How their eggs may be distinguished? The eggs of birds become hard by boiling; those of reptiles become soft. The eggs of the tortoise become soft. What, therefore, would you infer that it is?

2. *Parts, &c.*—The tortoise has a small head like that of a serpent; four legs; a tail. Children to decide how it defends itself. Name means of defence possessed by other animals. It has no horns, no sharp teeth. Children to infer that it cannot fight. Reference to the hare and the mouse; also other creatures that cannot. What these do when an enemy approaches? But the tortoise cannot run away. How, then, kept in safety? It has a hard covering. Describe shell. Very strong, thick, and hard; formed of many pieces. (Draw on the board, to show how these are joined.) Draw a diagram representing the shell of the back. There are *thirteen* large pieces in the middle, and *twenty-three* round the margin. Let the children count the number of pieces which compose the shell. Under part also covered with

shell. What they can call the tortoise, and why? Compare with crocodile, &c. Children to name the parts the shell does not cover. Tail has a scaly covering of its own. Head and four legs uncovered. How protected? Can be drawn into shell. Picture out the tortoise on a bright summer day, floating on its back in a calm sea, and enjoying itself. No enemy able to hurt it. How kind it is in God to create this creature for happiness. After floating for some time, it will want to swim. With what? How fishes swim? How the tortoise will be able to swim without fins? Show how beautifully its feet are formed as "paddles" for this purpose. After a while it will have to come to land to lay its eggs. Whether likely to go far inland, and why not? Care it takes to find a safe place for its eggs. Who enables it to do this? What would happen to the eggs if this were not done? It scrapes away the sand: how formed for doing this?

Summary.—The tortoise is a reptile. It is protected by a hard, strong shell, which covers its body, and underneath which it can draw its head and legs. Its feet are formed into "paddles," to enable it to swim, but furnished with nails hard enough to scrape away the sand where it wants to make a hole for its eggs. If time allows, tell the children that the shell is used for making combs, &c.; that men catch tortoises by turning them on their backs, with spikes, when they are on land; that they cannot get up; they then take them away, and hold them over a very hot fire; the upper shell loosens from the lower one, and falls off. The poor creature is then set free, and in another year a new shell appears.

Students in training may construct a sketch on "The Frog," as "The Tortoise."

For a sketch on an "Invertebrated Animal," see

3. *The Earth Worm.*

MATTER.—I. Habits. II. Parts. III. Uses.

I.—1. Worms live under ground. They come to the surface when disturbed; also in search of food.

2. Worms, when they appear above ground, keep their tails firmly fixed in their holes, that they may retire on the least alarm. Even when altogether on the ground, they adhere to the surface, and are not easily removed.

3. Worms feed on a very fine mould, which contains particles of putrid matter. They sometimes eject their food. What they throw up is called *worm casts.*

II.—1. The worm is boneless, and covered with a thick skin, which is formed into more than a hundred little rings.

2. Every ring has four sharp, hooked bristles on the under side. These the worm can lift up or press down at will.

3. The head is sharp and pointed. It has a mouth with two fleshy lips, but no eyes, nostrils, ears, nor brain.

4. The worm has a large stomach, which runs along the body to the end of the tail.

5. The worm has four holes down the back, by means of which it breathes.

6. It has reddish blood, which is cold.

III.—1. It removes and consumes decaying vegetable matter.

2. Worm casts are a fine manure for grass.

3. It loosens the ground.

4. It serves as food to various classes—birds, moles, and fish.

METHOD. I.—1. Where the children have seen worms? Where they hide? Disturbing causes likely to bring them to the surface; as, digging, uprooting of trees, &c. Necessity of the worms moving about in order to obtain food, brought out by comparison of animals with plants.

2. Refer to previous observation and experiment.

3. Children to judge what food worms are likely to find under ground—roots, slugs, grubs, &c. Why such food is unsuited to the worm? It has no teeth, therefore its food must be soft. Give information, and explain *putrid.*

II.—1. Bring out *boneless,* by comparison with the arm, or by letting the children feel the worm. Illustrate by means of a piece of spring wire with a long needle put through the ring, to show that while a boneless body can contract and lengthen, a body

formed with a skeleton cannot do so. Show the use of this contraction and expansion, by explaining how the creature moves. To show that the skin should be tough, refer to the effect of digging the ground with the hands.

2. The difficulty of lifting the worm from the ground. The advantage of this to the worm. Refer to the condition of a worm on a street pavement, or in a stone quarry. Why, in such a place, it must perish?

3. *Head.*—Why no eyes and ears? Refer to its habitation. No nostrils. Finds its food by touch of lips. Compare animals having brains, with brainless animals. Children draw conclusion from examples.

4. Refer to the character of the food; whence children judge of the small amount of nutriment it contains, and what difference this makes as to the quantity consumed.

5. Refer to the holes in our face. Absence of nostrils rendering some other means of breathing necessary.

6. Refer again to the habitation of the worm. Compare it with warm-blooded animals living under ground. The mole. Its covering. The exercise it takes. The worm has no covering, and no power of taking rapid exercise; but these are not needed by it.

III.—1. Refer to the nature of its food. Effects, if not removed.

2. Tell this.

3. Compare garden beds with garden paths, to show that in loosened soil the rain penetrates. The fibres of plants expand.

4. Refer to previous observation.

IV. *Summary.*—Children write out what matter they can remember under each head.

Students in training may construct "The Dor-Beetle," as "The Earth Worm."

4. *The Fish.*

I. *Habits.*—Found in water; some in salt, some in fresh; some emigrate from one to the other; some frequent shallow, some deep water. Usually they move with great rapidity, and in direct

lines, discovering their prey by the sense of sight, darting on it, catching it, and instantly swallowing it alive; red blooded, though cold blooded; breathing air found in water by means of gills; dying when taken out of the water; young produced from spawn; hatched by the heat of the sun.

Let the children condense what has been found out. Classify the actions of the fish under three heads:

1. Moving (swimming).
2. Preying.
3. Breathing. (W. B.)

II. *Adaptation of Parts to Habits.*—1. How adapted to swimming?

(*a*) By its shape: Pointed muzzle; head set on shoulders, without a neck; shoulders rounded; body rounded and tapering; tail set edgewise. Why?

(*b*) By its covering: Scales—strong, light, smooth, water proof, often varnished. Why? Refer to the artificial flies used by anglers—formed of many pieces. Refer to a suit of armor.

(*c*) By its limbs. Fins—light, strong, flat, undivided. Why? Compare with position of the fingers when swimming, and with the webbed foot of a water bird. How the fin offers resistance to the water; also its use in balancing the fish. Refer to the instability of the element in which the creature moves.

Tail compared with the fins as to size and position. From the difference in position, lead the children to infer that the use would be different. Use of the tail in guiding the course of the fish described and simply illustrated.

2. How formed for preying.

(*a*) Eyes—size, position. Absence of eyelid. Why?

(*b*) Mouth—its width. Teeth—compare with teeth of mammals, and refer to the food of the fish. Number of rows, shape, direction.

3. How formed for breathing in the water? Refer to the human lungs, as a spongy substance, pervious to air, and full of veins, filled with blood, to which the air penetrates. Examine the gills. How they differ. External organs, consisting of a succession of plates. The skin wrought into fringes at the end of each, so as to expose the greatest possible quantity of blood to the air. By experiment with a piece of sea weed, or of a buffalo robe, show that the blood is brought into contact with the air only when the gill is under water.

III. *Summary.*—Children write out what they can remember under each head and sub-head.

Students in training construct a lesson on "The Whale," as "The Fish," and then draw up sketch on "Comparison of Fish and Whale."

Lessons on Parts of Animals are sometimes advantageously given.

EXAMPLE.

5. *Horns of Animals.*

Get the children to name any animals they know having horns. Show the picture of a cow, a goat, and a deer. Let them find out the difference in the horns of these.

1. *As to Position.*—The horns of kine are placed in front of the head, and extend upward and outward. (W. B.) The horns of goats slant backward. (W. B.) The horns of stags branch in different directions. (W. B.) Bring this out by drawing the outline of a head, and let children represent the three kinds and directions of horns.

2. *As to Form.*—(*a*) The horns of kine are round, broad at the base, and tapering toward the point. (W. B.) (Compare with cylinder and cone.) They are curved. (W. B.) (*b*) The horns of goats have the same general form, but are larger than those of kine, and less curved. (W. B.) (Compare them.) (*c*) The horns of stags spread out from the base, like the branches of a tree. (W. B.)

3. *As to Substance.*—Horn is a stiff, hard, semitransparent, yellowish-brown substance. The horns of kine and goats have a bony core, that fills up the interior space of the horn. Stags' horns differ, in being solid. (W. B.) Children observe and describe the material of which horns are composed. Are told that the cow's horns are sometimes used as drinking cups. Why?

That goats' horns are the same in substance. How stags' horns differ?

4. *As to Uses.*—Horns are given as a means of defence to creatures that would otherwise be defenceless. (W. B.) (What cows do with their horns? goats? rams? Refer to the poor hunted stag when it stands at bay.) Why God has given horns to these animals? (Compare the teeth and feet of horned animals with those of carnivorous animals.)

Students in training construct a lesson on "The Teeth or Feet of Animals."

LISTS OF SUBJECTS.

Class Mammalia.

I. Monkey.
Ourang-outang.
Baboon.

II. Bat.

III. Mole.
Hegdehog.
Porcupine.
Ant Eater.

IV. Weasel.
Stoat.
Ferret.
Sable.

V. *Domestic Dogs.*
Spaniel.
Pointer.
Hound.
Terrier.
Fox.
Wolf.

VI. Cat.
Lion.
Tiger.
Leopard.
Panther.
Hyena.

VII. Brown Bear.
Polar Bear.

VIII. Seal.
Whale.

IX. Hippopotamus
Rhinoceros.
Elephant.
Tapir.
Pig.
Horse.
Ass.
Zebra.

X. Buffalo
Cow.
Sheep.
Goat.
Antelope.
Camel.
Giraffe.
Deer.
Reindeer.

XI. Beaver.
Squirrel.
Hare.
Rabbit.
Rat.

XII. Kangaroo.

MISCELLANEOUS SUBJECTS.

Boa Constrictor.
Rattlesnake.
Viper.
Common Snake.
Shark.
Dolphin.
Torpedo.
Cuttlefish.
Lobster.
Starfish.
Bee.
Ant.

Alligator.
Turtle.
Tortoise.
Frog.
Toad.
Salmon.
Cod.
Sole.
Herring.
Pike.
Housefly.
Beetle.
Spider.
Earth Worm.

FOURTH STEP.

CLASS OF BIRDS.

The teacher should begin by procuring a full set of pictures; specimens are still better. The children give the name that applies to all; then, as far as they can, the name that applies to each. Are told that it is the object of the lesson to put all these birds into classes, or groups. Children exercised in finding points according to which a classification may be made: According to color; according to size; as wild or tame; according to habitation, food, or structure. Children led to decide on the best basis for classification—structure. The best points on this basis are *beaks* and *feet.* They may then begin to classify. If they need guidance, teacher may direct their attention.

I.—1. To the eagle—the king of birds. Why so called? How characterized? Size, beak, claws. Children to infer the habits indicated by this structure. Select birds with similar characteristics; as, condor, hawk, owl. W. B. in column under title of "Birds of Prey."

2. Children to find a distinct group of birds. They choose, say the hen, turkey, peacock, on account of their resemblance, having blunt beaks, strong legs, heavy bodies. W. B. in column. Give the term *Ground Birds.* Children say how this name applies.

3. A third set of birds to be found. Children select, say stork and heron, for their long legs, bony beaks and necks. Form column under "Stilt Birds." Name—why given?

4. Children may perhaps next select the duck, goose, &c. May be told that all birds that frequent large bodies of water, whether fresh or salt, have one important characteristic, which

they must find out (webbed feet). Write column under "Web-footed Birds."

5. To lead them to discover another class, they must be told to compare the feet of the birds that remain unclassified. They will soon distinguish the climbing birds. Name given, and column made.

6. Children to be told that all the remaining birds are classed together as Perching Birds.

II. Children mention various birds, and decide in which column each name is to be written. The blackboard may appear as follows:

Birds of Prey.	*Ground Birds.*	*Still Birds.*	*Web-footed Birds.*	*Climbing Birds.*	*Perching Birds.*
Eagle.	Hen.	Heron.	Goose.	Woodpecker.	Raven.
Condor.	Turkey.	Stork.	Duck.	Parrot.	Magpie.
Hawk.	Peacock.	Flamingo.	Penguin.		Pigeon.
Owl.	Quail.	Ibis.	Gull.		Canary.
	Partridge.		Frigate Bird.		Lark.
	Ostrich.		Albatross.		Nightingale.
					Thrush.
					Wren.
					Robin.
					Kingfisher.

In recapitulating, the orders should be arranged as given by naturalists, and the term *order* given. Whether or not to give scientific terms, as *Raptores*, may be left to the discretion of the teacher. The English terms would seem to be as good as the Latin; thus,

1st Order.	*2d Order.*	*3d Order.*	*4th Order.*
Raveners.	Perchers.	Climbers.	Scratchers.
	5th Order.	*6th Order.*	
	Waders.	Swimmers.	

When the teacher names the order, the children should be able to give examples. Examples given by the teacher; they refer to the order. Lessons need to be given on the subordinate groups; as,

Raveners { Diurnal. { Feeders on fresh flesh. / Nocturnal. { Feeders on carrion.

Perchers { The Crow tribe. / The Swallow tribe. / The Finch tribe, &c.

Refer to any good work on Natural History. For example of Method, see sketch on

1. *The Swallow Tribe.*

I. Teacher tells the children that they are about to inspect a species of bird which spends almost all its time in the air, and hardly ever touches earth. Requires them to tell, first, what organs will be in constant use (wings). Of what general character these must be (large and strong). Secondly, which organs will hardly be used at all (legs). Of what character these (probably) will be (small and slender). Thirdly, what kind of food the birds will be able to find in the air (insects). Fourth, what birds will do when the cold winter comes, and no insects are to be found? (go to a warmer climate.) Fifth, whether they (children) can name the species they have thus far described?

II. Teacher produces specimen of the swallow (also a specimen of a bulfinch for comparison). Children will tell the structure: Long, slender, tapering, and light body (compared with bulfinch); very long wings (compared with the body); broad and forked tail; very wide mouth; very delicate beak (compared with that of bulfinch); short, slender legs; delicate but long and curved claws; thick plumage, smooth and glossy.

Children required to explain the adaptation of this structure to habits. If they have been previously trained, it will no longer be found necessary to question them on separate points. They will at once give the required explanation. Thus: Body light, that it may be easily sustained in air; long, slender, and tapering, that it may pass through air more swiftly and readily; thickest just below the neck, where the muscles of the wings are devel-

oped, that the muscles may be large and powerful enough to move them; tapering, for lightness; tail expanded, to help to support the body; length of wing, indicating the immense power of flight; very wide mouth, for catching its prey on the wing; delicate beak, corresponding with the general delicacy of the bird, indicating the soft character of its food; slender legs, not required for walking; thick plumage, to meet alteration of temperature; glossy plumage, that little friction may impede its flight. Teacher directs attention to habits, which children do not so readily discover: That of keeping insects in the mouth till many are collected; that of clinging to roofs, &c., when resting for a moment in flight.

III. Teacher presents specimens of swift and marten. Children compare these with swallow. Find swift the largest; can fly farthest; marten the least. Swallow distinguished by the peculiar beauty and burnish of its plumage. Information given as to the number of hours these birds pass in the air daily. Character of their movements. (Exercise the conceptive faculty.) Kind of nest. Special kind of food. Time of their appearance and departure. Countries to which they migrate. Scripture and poetical reference.

Summary.—Children write out lesson under heads:

I. Birds of swallow tribe. How distinguished?
II. General structure.
III. Habits, and adaptation of structure to them.

2. *Incidental Lesson on the Habitations of Birds.*

I. *Introduction.*—Get a list from the children with reference to the various habitations and localities of birds. (W. B., supplying their omissions.) The list may stand thus: Eagle, owl, lark, rook, magpie, ostrich, hen, swallow, heron, sea gull.

II. Let the children say what they know about the eagle. What sorts of places it frequents, or where it rears its young? Give any information required, and help the children to form a vivid conception of the craggy mountain top, far above the distant village; the few sticks that indicate a nest, &c.; the owl in the church tower, covered with ivy, looking forth at night like a sentinel; the lark, hidden in the meadow, springing up, soaring, singing; the rook, with its companions in the tops of the tall trees near the mansion house; the magpie on the apple tree in the cottage garden; the ostrich, with even pace, faster than the gallop of a horse, scudding over the interminable expanse of sand; the hen in the farmyard, by the barn door; the swallow circling above the pond; the heron on the edge of the marshy pool in the hollow of the dark moor; the sea gull cresting the white waves, or resting on the cliffs that border them. The children will recognize the goodness of God in peopling the world with so many beautiful and happy creatures. They will be ready to say: "O Lord, how manifold are thy works; in wisdom hast thou made them all; the world is full of thy goodness."

CLASS MAMMALIA.

1. The children, having finished the course on birds, may be required to draw on their previous knowledge of mammals, and to make a classification of them on the blackboard. A record of their work should be kept.

2. Next time teacher offers some help, directing their attention to the points which should guide them in classifying; as, limbs, teeth. They make a second list.

3. Next time the teacher gives them the number of orders. Children make third classification, which is compared with the proper one. Where this differs from theirs, and why?

The separate groups of mammals may now be taken up, but usually with brevity. Example:

1. *The Dog Tribe.*

I. Origin of dogs. Other animals of the dog tribe. Animals of the dog tribe named. Their general characteristics. Origin of the domestic dog. Whether from the jackal? the fox? the wolf? or an original dog? Resemblance in habits to the jackal, and in structure to the wolf. Point of difference in posi-

tion of the eyes, and possible reason for this. Comparison of the wolf and dog as to disposition.

II. Domesticated dogs. Different groups, and characteristics of each. European dogs compared with those of the East. Scripture illustrated. European dogs divided into three groups:

1. Arctic dogs.
2. Hunting dogs.
3. Watch dogs.

1. *Arctic Dogs.*—Where found? From the name, children decide in the north of Europe and Iceland, though also in Kamtchatka and China. How distinguished? Very sharp muzzle; pointed ears; shaggy hair, long at the neck; elevated curled tail; color black, white, or black and white. How connected with the second group (by the Newfoundland.)

2. *Hunting Dogs.*—Where found? In all the temperate regions, but especially in Europe. How distinguished (large pendulous ears; large jaws; long legs; thick tails). What the group includes (fox hound, stag hound, pointer, setter, terrier, and Danish dog—spaniel a cross).

3. *Watch Dogs.*—Found in all temperate climates. Physical characteristics not so marked as in the other groups. Greater variety in all respects. Reason for this. Includes all shepherd dogs; also mastiff, bulldog, and greyhound; the two last at first sight dissimilar, but nearly allied, having delicate feet, slender tail, good sight, imperfect smell, ferocious disposition. Irish greyhound called *wolf dog*. Anecdote of. How the third group is connected with the first? By the shepherd's dog. How with the second? By the greyhound.

III. Conclusion drawn as to the general characteristics of each group. The first are nearest to a state of nature; the second show in the highest degree the effects of physical cultivation; the third have most intelligence. Anecdotes proving this. Use of the dog to man, in every state. Goodness of God in giving him such a friend.

2. *The Cat Tribe.*

Animals of the cat tribe compared with those of the dog tribe. (Terms *feline* and *canine* given.)

1. Compared with respect to structure: Body, limbs, feet, shape of head, eyes, and teeth, covering, feelers.

2. With respect to habits: One found in packs, and the other alone, or with its mate. Character of food. Methods of securing their prey, &c.

3. With respect to appearance: Beautiful markings, spots, &c., on the glossy fur of the one; shaggy hair of the other.

4. With respect to distribution: The canine tribe is found all over the globe; the feline tribe chiefly in torrid regions, thinly inhabited by man. Wisdom of this arrangement. Species of each tribe distinguished. What species are found in the Old World, and what in the New?

INCIDENTAL LESSONS.

3. *Animals Used in Hunting.*

I. *Animals of the Dog Tribe.*—Draw from the children the fact that animals hunt as well as men. What kinds of animals hunt? Dogs. Children to say how the dog is adapted for hunting. Refer to the wolf as a natural hunter.

II. *Animals of the Cat Tribe.*—Tell the children that in Eastern countries animals of the cat tribe are used for hunting. Let them compare these with creatures of the dog tribe, and find out which make the best hunters. Creatures of the cat tribe (*a*) cannot run far; (*b*) are less docile; (*c*) are more bloodthirsty. Give account of the chetah, and, from the facts before discovered, let the children say why it must be brought in a cart to the field? Why blindfolded? Why allowed to drink the blood of its prey?

III. *Animals of the Weasel Tribe.*—Produce picture or specimen of a ferret. Refer to its tribe. Kind of animals it hunts (rats and mice). How adapted to this kind of hunting? Tell children that it is often muzzled, and set to hunt rabbits. Compare the cat, dog, and ferret, as *tameable* creatures. Refer to the

otter and ichneumon, creatures of the ferret tribe, as employed in India and Egypt. Conclude with reference to the power given by God to man over the inferior creatures. How it should be used?

4. *Sketch on Rodents.*

I. *Order.*—Present stuffed specimen or picture of the squirrel, rabbit, hare, rat, mouse. All or any, with a picture of a beaver. Children, who name each, are told they are grouped together, and required to find the basis of classification. It might be *size*, for they are small animals; or *disposition*, for they are timid; or *character of food*, for they live on hard substances; but the children know that animals are classed according to structure, especially the structure of the feet and teeth. Examination of the feet presents no special characteristics. We must look to the teeth. These creatures are named from the manner in which they use these. They gnaw, and are therefore called *rodents.*

II. *Structure of Teeth.*—Teeth of specimens examined, and diagram placed on the board.

1. Incisors: Sharp at the edge, chisel shaped, meeting the opposite teeth in a semicircle ⋛. Tell children that the front surface is of the hardest enamel, the inner surface of softish bone. What must happen to teeth that are constantly working against very hard substances? They must wear away rapidly. How this is provided for by constant growth of teeth, &c. Which surface will wear away the sooner? (The inner surface.) Effect of this arrangement on the shape of the teeth—securing always a sharp edge.

2. Grinders: Ridges—their direction, from side to side. Children find in what direction the rodent must move its mouth to grind its food. Are told the creatures are furnished with a strong muscle, which gives great power to the movement of the jaw.

3. Canine teeth absent. Rodents have no weapon of defence. Children to find five means by which they are protected.

1. They are small.
2. They are very timid.

3. They have large eyes.
4. They have ears pointing backward.
5. They have long bodies.

Use of each point to the rodent?

III. *Summary.*—Substance written on the board as dictated by the children; the teacher, however, leaving ellipses for them to supply in reproducing the lesson on paper.

Gnawing animals include ——. They are so named because ——. They have sharp ——, which enables them to ——. The front surface is ——, the under merely ——. Constant feeding upon —— causes ——. This is remedied by ——. The soft bone wears away, while the ——. The advantage of this is ——. The grinders are ——, so that in masticating the food the jaw must be ——. The jaws have great power, owing to ——. Canine teeth are ——. The rodents have many enemies; cannot ——, but often escape, because ——.

5. *Clothing of Animals.*

I. *Introduction.*—Let the children know the subject of the lesson. Get them to name animals having different clothing. If they are slow in giving examples, suggest the animal, and let them say how it is clad. Put down each answer on the board, thus:

The cat is covered with fur.
The herring is covered with scales.
The horse is covered with hair.

II. *Classification.*—Help the children to classify the facts, putting them on the board, asking where each creature lives, and marking those that live on earth with fig. 1; those that live on air, with fig. 2; those that live both on land and in water, with fig. 3; give the term *amphibious;* and those that live in water only, with fig. 4. Children state the clothing of each set (W. B.) from dictation. Mammals are clothed with fur, hair, wool, or skin only. Birds are clothed with feathers; some have an undergarment of down. Reptiles with a thick skin, scales, or shelly plate. Fish, with thin scales.

III. *Adaptation.*—Let the children imagine a creature like a horse, with a covering of feathers. Why they would not suit him? They would be much too warm. With a covering of scales not warm enough, yet would check perspiration. Refer to the condition of horses after a gallop; the structure of their skin, &c. With a shelly covering; this, by its weight and stiffness, would impede motion. The horse has a skin just suited to it. But feathers are the covering for the eagle—why? Scaly plates for a crocodile—why? A thick, hairless skin for an elephant—why? Scales for a mackerel—why? Why jointed? Go over the list, leading the children to see the adaptation in each case. One cannot do this without reference to the infinite wisdom and goodness of God manifested in this adaptation.

A series of lessons corresponding to the last should be given, thus:

1. Limbs of animals, and their movements.
2. Localities (general) in which animals are found.
3. Breathing, and circulation of blood.
4. Form in which the young first appear.
5. Finally, the children should be led to distinguish vertebrated animals from others, and to put them into the four great divisions:

Mammals. Birds. Reptiles. Fishes.

The teacher can proceed in the same way with invertebrated animals. It is evident, however, that the later courses must become less full, and more general, than the earlier ones.

In conclusion, the scholar should be led to recognize all the groups as component parts of the one great system of animated nature. See Mrs. Redfield's "Chart of the Animal Kingdom."

LESSONS ON PLANTS.

DESIGNED AS THIRD STEP LESSONS.

On the Nature of Plants.

THE teacher should be prepared with an object for the lesson selected from each grand division of the natural kingdom; as, a plant, an animal, and a stone. Call upon the children to observe that the three are very different. Tell them to find out something which may be said of all of them, but which could not be said of a hat, a knife, or a watch. The plant, the animal, and the stone, were made as they are by God; man did not make them. We call them *natural.** To which of the three objects are *you* most like? In what respect do you and the plant differ from the stone? What will some day happen both to you and to the plant, which never can happen to the stone? We and the plant shall die. (See that the children understand, that when we speak of death, as applied to plants, we mean that they cease to live, and then decay.) In what, then, does the stone differ from animals and plants? The stone has not life. What can you say of a vegetable? That it has life. What do living things need to support their life? Food. Where do animals take in their food? By what organ? By the mouth. Where do vegetables take in their food? By what organ? By their roots. In what, then,

* It is not expected that the children will so immediately arrive at this conclusion, but the question is suggested in order to show that the idea is to be drawn from them, their minds being stimulated and directed by the questioning of the teacher. The answers are inserted in order to indicate the point to which they are to be brought.

2 : 10 to 2 : 25.—Sub. 4, Number, with Objects.
2 : 25 " 2 : 35.—Singing, Roll-call, and Dismissal of Youngest Children.
2 : 35 " 3 : 00.—Reading from Books.

Children not engaged in Class exercises, are occupied with their slates in printing, or drawing.

B Class, or Second Year.

A. M.

9 : 00 to 9 : 15.—Opening Exercises.
9 : 15 " 9 : 40.—Sub. 1, Reading. Sub. 2, Making Tables on Slates.
9 : 40 " 9 : 45.—Physical Exercises.
9 : 45 " 10 : 5.—Sub. 2, Reading. Sub. 1, Making Tables on Slates.
10 : 5 " 10 : 20.—Phonic Spelling, both Divisions.
10 : 20 " 10 : 35.—Recess.
10 : 35 " 10 : 55.—Examine Work on Slates.
10 : 55 " 11 : 20.—General Lesson.
11 : 20 " 11 : 35.—Recess.
11 : 35 " 12 : 00.—Sub. 2, Number. Sub. 1, Print Phonic Spelling.
12 : 00 " 12 : 5.—Singing, and Dismissal of Sub. 2.
12 : 5 " 12 : 30.—Sub. 1, Phonic Spelling from Slates.
12 : 30 to 1 : 30.—Intermission.

P. M.

1 : 30 to 1 : 50.—General Lesson.
1 : 50 " 2 : 5.—Inventive Drawing.
2 : 5 " 2 : 10.—Physical Exercises.
2 : 10 " 2 : 25.—Sub. 2, Phonic Spelling. Sub. 1, Drawing, or Printing.
2 : 25 " 2 : 45.—Sub. 1, Number. Sub. 2, Drawing, or Printing.
2 : 45 " 3 : 00.—Examination of Work on Slates.

A Class, or Third Year.

A. M.

9 : 00 to 9 : 15.—Opening Exercises.
9 : 15 " 9 : 40.—Sub. 1, Reading. Sub. 2, Preparing Reading Lesson.
9 : 40 " 9 : 45.—Physical Exercises.
9 : 45 " 10 : 5.—Sub. 2, Reading. Sub. 1, Preparing Tables on Slates.
10 : 5 " 10 : 20.—Sub. 1, Phonic Spelling. Sub. 2, Preparing Tables on Slates.
10 : 20 " 10 : 35.—Recess.
10 : 35 " 10 : 55.—Sub. 1, Number. Sub. 2, Drawing on Slates
10 : 55 " 11 : 20.—General Lesson.
11 : 20 " 11 : 35.—Recess.
11 : 35 " 11 : 55.—Sub. 2, Number. Sub. 1, Drawing or Slates.
11 : 55 " 12 : 00.—Singing.
12 : 00 " 12 : 30.—Examination of Work on Slates.
12 : 30 to 1 : 30.—Intermission.

P. M.

1 : 30 to 1 : 55.—General Lesson.
1 : 55 " 2 : 10.—Tuesday and Thursday, Inventive Drawing. Monday, Wednesday, and Friday, Reading Stories to the Children.
2 : 10 " 2 : 15.—Physical Exercises.
2 : 15 " 2 : 35.—Sub. 2, Phonic Spelling. Sub. 1, Occupied with Slates.
2 : 35 " 3 : 00.—Examination of Slates.

The following Programme will show more minutely the work in Object Lessons. It is taken from the books in Model School, being a Programme for the Second Month of the First Term, from May 20th to June 9th.

C Class.

Birds.

Redbreast.—Parts that distinguish. General conversation; cultivate humane feelings.

Peacock.—How distinguished. Moral lesson.

Lark.—How distinguished. Number of parts—Two eyes, two wings, one body, one tail, &c.

Parrot.—How distinguished. Names of parts.

Stork.—How distinguished. Position of parts.

Falcon.—How distinguished. Principal and secondary parts, or parts of parts.

Dove.—Number and position of parts.

Nightingale.—Names of parts which are distinguished as principal and secondary.

Place.—*First Step.*

1. Objects placed in different positions by the teacher; children to imitate with minute accuracy.

2. As 1.

3. Objects placed in different positions; teaching the meaning of the term to express the position; as, *beside, between, under;* and the children imitate and apply the terms; then place the objects as directed, without a pattern.

4 and 5. As 3.

6. Objects placed; their position described, and represented on the blackboard.

7 and 8. As 4 and 5.

Size.—*First Step.*

1. Idea of *large* and *small.*
2. " *long* and *short.*

3. Idea of *wide* and *narrow.*
4. " *thick* and *thin.*
5. " *deep* and *shallow.*
6. " *deep* and *high.*

7 and 8. Various objects described with reference to all their qualities.

B Class.

Color.

1. Yellow, Red, Blue, Orange, Green, Purple, Citrine, Olive, Russet, distinguished, named, and matched.

2. Children form patterns with colored cards. *First,* like those made by the teacher, and then as they will. They are, however, limited as to the colors they put together, in order to accustom the eye to harmonious combination of colors merely.

Yellow and Purple.
Red and Green.
Orange and Blue.

3. Orange and Purple.
Green and Purple.
Orange, Green, and Purple.

4. Citrine and Red.
Citrine and Blue.
Citrine, Red, and Blue.

5. Russet with Blue.
Russet with Yellow.
Russet with Blue and Yellow.

6. Olive with Red.
Olive with Yellow.
Olive with Red and Yellow.

7. Black with Red.
Black with Yellow.
Black with Red and Yellow.

8. Black with Orange.
Black with Green.
Black with Orange and Green.

Though the exercises in Color Patterning are not exhausted, and must be referred to again, it will be better now, for the sake of variety, to proceed to the Third Step in Color.

1. Re-calling Color.—Lesson on Red.
2. " Yellow.
3. " Blue.
4. " Green.
5. " Orange and Purple.
6. " Citrine, Russet, and Olive.
7. General Term.—Beauty of Color, &c. Color of Inanimate Nature.
8. General Term.—Color of Animated Nature.

PLACE.—*Cardinal Points.*

1. Idea of *East* and *West.*
2. Idea of *North* and *South.*
3. Idea of *Cardinal Points.*
4. Idea of term, *Cardinal Points.*
5. Exercises on the term, *Cardinal Points.*
6. Exercises on all the Points.
7 and 8. Necessity for having Four Points.

A Class.

BIRDS.

1 and 2. Eagle.
3. Condor.
4. Falcon.

PLACE.

Practice in drawing to Scale.
Schoolroom, adjoining rooms, school building.
Schoolroom with furniture, &c.

LANGUAGE.—*Begin the Course.*

Forming sentences with the name of an Object.

Forming sentences with a word expressing Quality.
Forming sentences with some part of the verb "to be."

EXAMPLE.—*The Pencil is Sharp.*

Forming sentences in which different qualities are ascribed to the same object; as,

Sugar is sweet.
" white.
" brittle, &c.

The different sentences afterward contracted into one.

Forming sentences in which the same quality is ascribed to different objects; as,

Glass is brittle.
Chalk is brittle.
Coal is brittle, &c.

The different sentences contracted into one.

THE END.