

of all other materials. Slating may be procured from all dealers in school apparatus.

3. *Color.* Green is most grateful to the eye, and answers for all purposes as well as black. After years of observation and experiment, I am constrained to recommend the use of green. Give the board two coats of black, then two of green, and it will not need repairing for several years.

4. *Erasers.* During recitation, each member of the class should have an eraser. Small strips of sheepskin will answer, but it is better to secure a sufficient number of the best erasers.

5. *Crayon.* The common, cheap crayon gives the best satisfaction. If the erasing is done slowly, and with a downward movement, the dust is not seriously offensive. Pupils need to be trained to erase properly.

6. *Crayon Trough.* The wainscoting should extend up to the board. At the bottom of the board should be securely fastened a trough, three inches wide and one inch deep. In this is kept the erasers, also a supply of crayon. This is the best possible arrangement. Pupils need to be trained not to touch the crayons except in class, or by direction of the teacher.

7. *Use of Blackboard.* The least competent and most obscure teachers use the board in mathematics. The skilful teacher uses it in all recitations. In language and grammar the exercises are written on the board, and sentences are analyzed and parsed on the board. In geography maps are drawn and lessons outlined. In reading, words are spelled and defined; inflection, emphasis, pitch, force, and quality of voice are marked. But it is needless to enumerate. The qualified teacher will no more attempt to teach without ample blackboard surface than the farmer will attempt to farm without a plow.

II. READING APPARATUS.

Illustrated reading charts, slates and blackboards are all that are needed. To interpret and illustrate the lessons, every available object will be marshaled into service.

III. MATHEMATICAL APPARATUS.

Form and number must be taught to children concretely. Every step must be first taken objectively. Interest, clear ideas, and culture of the perceptive faculties result from this method.

1. *Geometrical Forms.* These can be made by teacher and pupils, but it is better to secure a box of accurately made forms. These forms are of great value in education.

2. *Bundles of small sticks,* 6 inches long, and about the thickness of matches, furnish the best means of illustrating the processes and operations of arithmetic. Each pupil is furnished a bundle of these sticks and trained to use them.

3. *The numeral frame* is valuable, and should have a place in every district school.

4. *Weights and measures* are necessary aids. With these, the drudgery of committing to memory unmeaning tables disappears. The study of denominate numbers becomes a real pleasure. The pupils understand what they are doing. Each child learns easily what he himself demonstrates by experiment. With these, the metric system may be rendered familiar to all, and the way prepared for its universal use.

IV. GEOGRAPHICAL APPARATUS.

The earth is the real basis of instruction in this branch. Each lesson is based on the child's observation and experience. Correct teaching leads the child to observe and discover for himself. Apparatus greatly aids.

1. *Globes.* A globe, in a case, eight to twelve inches in diameter, and a five-inch hemisphere globe are needed. With these nearly all geographical topics may be illustrated.

2. *Maps.* A set of outline maps, and local maps of the township, the county, and the State, are indispensable. These maps, as well as the globes, will be advantageously used in almost every recitation. Only quack teachers are guilty of the crime of leaving these valuable aids unused, or of suffering them to be destroyed. Shame on such stupidity and neglect.

3. As important as any of the instrumentalities mentioned, is the box of sand, the use of which gives the pupils accurate ideas of certain physical features of the earth. No teacher is excusable who omits making use of these easily obtained articles.

V. CABINET.

A small collection, to illustrate the natural sciences, can be made by the teachers and the pupils. The school board, of course, will provide cases.

1. *Mineral specimens* of the neighbourhood can be collected and

classified. Exchanges can be made with other sections. The pupils may secure the donation of fine specimens. Many geological specimens may also be procured.

2. *Botanical specimens.* The kinds of wood, leaves, flowers, grains, etc., of the surrounding country, may be prepared and arranged for the purposes of illustration. While affording recreation, the work of collecting and preparing these specimens will prove to be exceedingly profitable.

3. *Zoological specimens.* Birds, insects, shells, etc., may be secured and classified. These, and indeed nearly all the other objects collected, may be used to illustrate reading lessons, object lessons, lessons in geography, etc., etc.

4. *Value of the cabinet.* A small cabinet, suitable for a country school, is inexpensive; and, from year to year, it will increase in importance. Its value, educationally and practically, is very great. Pupils are trained to the habit of analytic observation. They learn to gain knowledge at first hand. It enables the teacher to open up to the children some of the most interesting phases of nature. The basis is laid in experience for all future achievements of science. The masses no longer limited to the R's, are introduced to the great realms of the natural world.

VI. COST.

It is astonishing, when we find that the common school set of apparatus costs only about \$60, that any school should be unsupplied. It is mortifying to know that less than one-third of the schools of the United States are unsupplied. Men squander millions on their appetites, and leave their children destitute of the necessities of intellectual life. Judicious expenditure is true economy. Money invested in

SCHOOL APPARATUS

pays the highest possible dividends.

VII. USE OF APPARATUS.

A prominent work in normal schools and normal institutes is to train teachers in the use of apparatus. But without such training the ingenious teacher may work up to a high degree of skill. Teaching is decidedly common sense work. Here is the child to be educated. Here are the instrumentalities. (Great educational principles are the teacher's chart and compass. Good judgment guides in the application of means to ends.

The teacher is an artist. He fashions immortal spirits. Here, avoidable mistakes and the withholding of the necessary educational instrumentalities are worse than crimes.—*American Journal of Education.*

The Carleton Place *Herald* in an article on "School-room Headaches" says:—"Many people who have public school teachers among their acquaintances are firmly of the opinion that the school-room has a headache system all its own, and their impression would be strengthened if they were to interview boys and girls. There is nothing strange about the complaint; the only wonder is that it is not continuous and that anybody escaped it. With systems of heating and ventilation that are almost uniformly defective, and, worse yet, under the control of janitors who have no knowledge whatever of these departments of their business, and who are as apt as any other men to neglect or despise whatever they do not understand, many of our school-rooms are boxes almost hermetically sealed, into which hot air is being driven and compressed. The heat is frequently intolerable, the expired breath and other physical emanations of the children pollute the air to a degree extremely dangerous to health, so teacher and children, who, at nine o'clock entered the room in fair health and spirits, emerge at noon with listless step, aching head and deranged vital organs."

A mistaken notion of love sometimes induces a form of caresses and a show of affection not prompted by the heart, and only worthy of being despised. We have personally known teachers who were seized with an indiscriminate, overwhelming affection, at the very moment of their entrance into a school, who scattered in lavish profusion the most endearing adjectives, and who closed every day by sending each young hopeful home to his mother with a parting kiss.

A certain jolly member of the board of education once visited such a school. Four o'clock came, and the boys and girls stood up in marching order. The school-mistress took her station at the door, and, one by one, the departing urchins received a loving embrace. The afore-mentioned "member," to use his own words, in the excitement of the moment, forgot himself, and, thinking he was a boy again, joined the procession.