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FOR THE ATLANTIC PROVINCES OF CANADA.

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CONTENTS:

EDITORIAL.....	177-178
Supplementary Reading.....	178-179
Nature Study and Science.....	179-180
Suggestions for Primary Grades.....	180-182
Cardboard Work No. 2 (Illustrated).....	182-184
Manual Training and its Effects upon Character Building.....	184-185
Male Teachers for Schools.....	185
Teaching versus Preaching.....	186
A Children's Page.....	187
Busy Work—Memory Gems.....	188
CURRENT EVENTS.....	189-190
SCHOOL AND COLLEGE.....	190
'ROUND TABLE TALKS.....	190-192
RECENT BOOKS.....	192-194
FEBRUARY MAGAZINES.....	194

NEW ADVERTISEMENTS—
C Flood & Sons, p. 194—Harvard University, p. 194—Teachers Wanted, p. 194.

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EDUCATIONAL REVIEW,
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IN the present number of the REVIEW will be found a second contribution from Mr. Kidner on Cardboard work. These articles, with the illustrations that accompany them, are of great value to teachers, enabling them at a slight expense to their scholars to introduce a simple but effective series of exercises in manual training. Mr. Kidner's drawings are models of neatness and accuracy, and the simple directions laid down in the exercises should encourage teachers to do their utmost to ensure habits of neat and accurate work in their pupils. It should be remembered that the illustrations on another page are reduced to nearly one-third the size of the original drawings. We have on hand some copies of the January number with Mr. Kidner's first article of the series.

THE REVIEW congratulates Mr. J. B. Calkin, M. A., of Truro, on the well-deserved compliment extended to

him on his election to membership in the National Geographical Society of America. Mr. Calkin's work as a geographer and historian has not been confined to his native province, but is recognized abroad.

THERE are many vacant schools in New Brunswick this term. Teachers should read the advertisement in another column.

MR. BRITAIN's suggestion in this number of the REVIEW should receive attention. School libraries and apparatus, we fear, have suffered loss from carelessness on the part of teachers and the want of a little expense and forethought on the part of trustees.

FROM Chickering & Sons, piano makers, Boston, comes a very striking and unique sketch, commemorating the Historical Musical Exhibition in that city in January. It is the work of Will Bradley, the famous designer, and is one of the best pieces of work in this line that he has ever done.

WE have received from Hon. Clifford Sifton, Minister of the Interior, Ottawa, the Atlas of Western Canada, showing fine maps of the provinces and territories of Canada, North America and the British Islands, with photographic views illustrating the scenery and productions of the west. There is also a great mass of information about Canada, and especially the great Northwest, embracing facts and figures derived from the recent census. It is an excellent and useful publication.

A Summer School of Manual Training will be held in St. John in July next, conducted by Professor MacCready and his assistants of the Macdonald School of Fredericton. Those who availed themselves of the excellent opportunities afforded last summer will be glad to hear that a continuation of the course is to be given next summer.

THERE is a steady demand for the volume of Canadian History Readings published by the EDUCATIONAL REVIEW. It is sent postpaid to any address for one dollar. Its 350 pages of sketches and stories supplement admirably the text-books on Canadian History now in use. A copy should be found in every school,

Educational Advance.

The time has gone by when manual training, nature study and domestic economy were considered as "fads." In Sweden, Germany, France, Switzerland, the United States, even in conservative England, the need of a more practical training has asserted itself, and the result has been to bring the schools into closer touch with the needs of the people. In Canada the movement in this direction has been of slower growth, but lately, owing to the magnificent generosity of Sir William Macdonald and the energy and skill of Prof. Robertson, public opinion in nearly every province has been aroused, the initiative steps taken in the more energetic communities, and a satisfactory degree of interest shown in others. It would seem that nothing is needed now but for our people to wisely consider their educational needs, then to set to work with vigor and faith, and show the men who have invested brains and money for the public good that this expenditure has not been made in vain.

As our readers already know, a plan for the improvement of education in rural districts was brought before the Dominion Teachers' Association at Ottawa last August. Sir Wm. Macdonald has again come forward with money to carry out the details of the scheme. Prof. Robertson has conferred with the leading men in each province, and with specialists at Washington. The result is that a scheme has been devised, far reaching and national in character, which will help to improve the status of the schools throughout Canada. Guelph, Ontario, has been selected as the place for the establishment of a training institute for teachers. The Ontario government is co-operating, and buildings will be erected there, which, with the Agricultural College, will be used for the training of teachers from all parts of the Dominion. In addition to this, one or more schools will be established in each province, in a position where the advantages of centralization may be exemplified, where school gardens may be managed for the better study of nature and agriculture, where domestic economy and manual training can be taught by experts to teachers and pupils alike. In such schools the ordinary school branches will not be neglected, but will be taught more definitely and with greater interest because of the awakening of a new spirit in the learner, which will quicken his mind in proportion as his eye and hand are trained. It is the experience of the best teachers in the schools where manual training and nature study are taught that the pupils do not fail in the purely intellectual work. And this should be true; for quality of work, not the quantity, is the aim sought for in education.

The N. B. Normal School.

The many friends of Dr. Wm. Crocket will be glad to hear of his appointment to the principalship of the Normal School of New Brunswick, in place of Mr. Eldon Mullin, who resigned to take charge of the normal school at Pretoria, South Africa. Dr. Crocket has had a wide experience in the educational work of this province, having been principal of the normal school for many years before he assumed the office of chief superintendent of education. He comes to the position with the warmest wishes for his success, both from the new generation of teachers and those who have in years past been associated with him as friends and students. By the latter he has ever been regarded with respect and affection on account of sterling character his enthusiasm as a teacher and the high quality of his instruction. We congratulate the Board of Education on the choice it has made, which the teachers of the province will heartily endorse; and we hope Principal Crocket will be spared for many years to carry on a work with which he has been so long and so honorably associated.

The REVIEW extends to Mr. Mullin its best wishes for a pleasant voyage and a successful career in the position which he is about to assume in South Africa.

Supplementary Reading.

Editor Educational Review:

DEAR SIR,—Following a discussion in the Fredericton Teachers' Association on the best means to develop a taste for good reading among our pupils, a committee was appointed to form a short list of the best books for supplementary reading in the various grades. The following list was approved, and, as it was thought it might possibly be helpful to teachers in other parts of the provinces, I was instructed to send you a copy for publication.

I. ELEMENTARY GRADES: I TO IV. INCLUSIVE.

1. In the Child's World..... Emilie Poulsson.
2. Child Life in Many Lands... Etta Austen Blaisdell.
3. Child Life in Literature..... Etta Austen Blaisdell.
4. Child Life in Tale and Fable..... Etta Austen Blaisdell.
5. Alice in Wonderland..... Lewis Carroll.
6. Through the Looking-glass Lewis Carroll.
7. Andersen's Fairy Tales... ..
8. Grimm's Fairy Tales... ..
9. Myths..... Helen M. Beckwith.
10. Myths and Fables..... Andrew Lang.
11. The Bird's Christmas Carol..... Kate Douglas Wiggan.
12. The Story Hour..... Kate Douglas Wiggan.
13. Patsy..... Kate Douglas Wiggan.
14. The Story of a Short Life..... Mrs. Ewing.
15. Jack-a-Napes..... Mrs. Ewing.

16. Hiawatha Primer..... Florence Holbrook.
17. A Child's Garden of Verses..... R. L. Stevenson.
18. Eugene Field's Poems.....
19. Little Lord Fauntleroy..... Mrs. Burnett.
20. Under the Lilacs..... Louisa Alcott.
21. The Birds of Killingworth.....
22. Black Beauty.....
23. Beautiful Jo..... Miss Saunders.
24. Little Nature Studies..... John Burroughs.
25. Nature Studies in Elementary Schools.....
..... Mrs. L. L. W. Wilson (MacMillan & Co.)
26. Seed Babies..... Margaret W. Morley.
27. Water Babies..... Charles Kingsley.
28. Five Little Peppers.....
29. Wilderness Ways..... Wm. J. Long
30. Wild Animals I Have Known..... E. G. Thompson.
31. Classics for Canadian Children..... A. & W. MacKinlay.

II. ADVANCED GRADES: V TO VIII, INCLUSIVE.

1. Swiss Family Robinson.....
2. Robinson Crusoe..... Defoe.
3. Little Men..... Alcott.
4. Little Women..... Alcott.
5. Arabian Nights.....
6. The Last of the Mohicans..... Cooper.
7. The Pathfinder..... Cooper.
8. Ivanhoe..... Scott.
9. The Talisman..... Scott.
10. Tales of a Grandfather..... Scott.
11. Christmas Stories..... Dickens.
12. Old Curiosity Shop..... Dickens.
13. Phillips' Picturesque History of England.....
14. Roberts' History of Canada.....
15. Scottish Chiefs..... Porter.
16. Uncle Tom's Cabin..... Stowe.
17. Tom Brown's School Days..... Hughes.
18. Treasure Island..... Stevenson.
19. Sketch Book..... Irving.
20. Grandfather's Chair..... Hawthorne.
21. Twice Told Tales..... Hawthorne.
22. Tales from Shakespeare..... Lamb.
23. Penelope's English Experiences..... Wiggan.
24. My Saturday Bird Class..... Miller.
25. The Seats of the Mighty..... Parker.
26. Charles O'Malley..... Lever.
27. Picture from English Literature..... Hamlin.
28. A Sister of Evangeline..... Roberts.
29. Readings in Canadian History..... EDUCATIONAL REVIEW.
30. In the Heart of the Ancient Wood..... Roberts.
31. The Sky Pilot ("Ralph Connor")..... Gordon.
32. Ben Hur..... Wallace.
33. The Lives of the Hunted..... E. S. Thompson.
34. A Book of Short Biographies of Famous Men, Authors,
Inventors, etc.
35. The Youth's Companion, and other good periodicals for
young people.

It is hoped that the above list may be supplemented by the names of books which other teachers have found to be helpful.

Yours faithfully,

BERTON C. FOSTER.

For the EDUCATIONAL REVIEW.]

NATURE STUDY AND SCIENCE.

By JOHN BRITTAI, NORMAL SCHOOL, FREDERICTON.

Hints on the Teaching of Elementary Science.

The papers written in the Normal School Entrance Examinations in New Brunswick show that, from year to year, a little more attention is being given to nature studies, and that in some schools the teachers give a connected and effective series of lessons based on observation and experiment.

It is still, however, only too evident that in the majority of the schools little real nature study is done, and that lessons on natural objects and phenomena play no serious part in the work of the school—what little is attempted being performed in a loose and hasty manner, often, in the case of candidates for normal school, by memorizing descriptions taken from text-books and note-books.

It seems—and I am convinced it is—a great pity that nature should be practically excluded from so many of our schools. Surely the diligent and earnest teacher, by a wise adjustment of time and classes, could find a place for a short series of nature lessons each term without neglecting the prescribed book work.

During our long winter, there is little opportunity for the study of plants or birds. But in schools where the older pupils have passed the elementary grades, nothing would be more useful than a series of well-arranged and wide-awake lessons on the common gases of the air, water and earth, and the common minerals, of which, in a finely divided state, the soil, both of the country farm and the town garden, are made up. These lessons, to be interesting and effective, must be based on experiments and practical tests, in which all the older pupils, and not merely those intended for normal school, should be allowed to take part. Such a course of lessons would open their eyes and minds to the basal facts and elementary principles of physics and chemistry—the two sciences upon which all the industrial arts and applied sciences are founded—and make it possible for them to become more intelligent and resourceful workers in every sphere of human action.

The writer has, during the last few years, selected sets of apparatus and minerals adapted for such a course of lessons, for about 150 schools. The cost of a supply for an ordinary school need not exceed from \$5 to \$10, and will last for years with an annual outlay of about \$1 for replenishment. Quite often, however, the school has no cabinet in which the apparatus can be arranged and locked up. And so it happens that, after the teacher through whose efforts the apparatus was pro-

cured has left the school, through the neglect of the school authorities, or of the succeeding teacher, the apparatus is lost or broken, and the specimens of minerals scattered. It seems to me that the Board of Education would do a very good thing were it to oblige every district to provide a cabinet, no matter how plain, of sufficient capacity to hold a small library above, with a closet below in which natural history specimens and apparatus for lessons in elementary science might be arranged and safely kept.

As spring advances, lessons on our native trees and other plants are in order, and for these lessons material is abundant and accessible, without cost in money, even to the schools of our villages and towns.

We have but few birds in winter; but by the first of April the migratory birds will be beginning to return to the land where they broke their shells and first opened their eyes on the bright but dangerous world. And then the children and the teachers, too, can find much to learn on their way to and from school, and on their other walks. Town and village children, with sharp eyes and sympathetic hearts, will find much to see, for during the season of migration, many birds frequent the suburbs, parks and shores.

A nature calendar should be kept in every school. If black-board space cannot be afforded, the entries may be made on a sheet of foolscap paper, pasted on cardboard and hung upon the wall.

The spring calendar may begin with that day in March upon which the sun reaches the equinoctial. In this calendar should be recorded the more striking weather phenomena — snow-storms, rain-storms, floods, droughts, the disappearance of the snow, the opening of the brooks and rivers, etc.; the state of the buds on the trees, the swelling of the buds, the order in which the leaves of the different species open out, when the leaves of each are half-grown and full-grown, when each species blooms; and the dates of the early and later spring flowers. The first arrivals of the different species of migratory birds should be entered in their order; when observed the second time; when they begin to build their nests; the first bumble-bee and the first butterfly seen; the opening of the music of the frogs and toads. Easily observed celestial phenomena should be included—when and where the new moon was first seen—and the full moon; the hour at which the sun rises at the first of each month, and when it sets; the length of the day (time of day-light), counting from sun-rise to sun-set at the first of each month, and the length of the night, etc.

If encouraged by the teacher, most of the children will watch closely for contributions to the calendar, and

and will thus quicken their observing faculties and broaden their sympathies and interests. The teacher and each pupil should make a copy of the calendar for preservation.

Questions for February.

(Answers to be sent to the editor of this department, J. Brittain, Normal School, Fredericton, by March 15th.)

1. Get a branch from a birch tree out of doors, and make a drawing of that part of it which bears buds.
2. Do the same with a maple branch.
3. Find how long a time intervenes between sun-rise and sun-set, and between sun-set and sun-rise, on St. Valentine's Day. Show the arithmetical operation.
4. What wild birds did you observe during the last half of February? How did you know each? and what was each doing at the time?
5. Find how many toes a dog has on each foot. How do his claws (toe-nails) differ from those of a cat?

Suggestions for Primary Grades.

BY MRS. S. B. PATTERSON.

Short Talks on Fuel.

Introduce the subject of heat on one of these cold mornings when Jack Frost is nipping everybody's fingers. How do we keep him out of our houses? Perhaps by stoves in the different rooms, or, possibly, by hot water, steam, or hot-air furnace. The children will be interested by the reference to their respective homes, and may be allowed to describe the method used.

What sort of fuel do we use? Can you tell of any people who have neither wood nor coal to warm their houses? This should suggest last month's talks about the Eskimos with their stone lamps in which pieces of blubber from the whale are melted into oil, burning on a wick of dried moss. Refer also to the peat used in Ireland and other places. Tell of the use of natural gas for heating and other purposes, where men have simply to bore deep down into the earth and sink pipes leading the gas to their houses and into the empty stoves, dropping in a piece of burning paper to set it on fire. There it blazes away, heating the house, and doing all the cooking they wish without leaving behind it any ashes to lift.

WOOD.—Why is wood brought to our houses mostly in winter? By a few questions as to the farmer's work during different seasons of the year, lead the children to see that the men have more time for such work in the winter. Show also that a load is more easily hauled in sleds on the snow than on bare ground with wheels.

Again, describe the ordinary wood-roads, rough and almost impassable in swampy places at other seasons, but in winter frozen over and packed in with deep snow.

What is the difference between green wood and dry? Which costs more? Why? How is the sap to be dried out of the wood? Sometimes the mother puts green-wood under the stove to dry, but does she like to have to do that? How many can tell hard-wood from soft? Which gives the more heat? Which is better for kindling? Why? Name some soft-wood trees, some hard-wood.

Tell of the care that must be taken by men felling trees in the woods. Describe the process of chopping off the limbs, splitting the trunk, and cutting it into sticks, usually four feet long. How is a pile of wood measured? How long is a cord of wood? How wide? How high?

COAL.—Where does our coal come from? Speak of it as one of the hidden treasures stored away by God for our use. He knew that some day wood would be scarce, and so He made the coal, hiding it away in the earth for men to find when they needed it. By looking closely at it, studying the places where it is got, and thinking carefully about it, wise men have found out how coal was made.

Long, long years ago, before there were any people in this world, there were great forests of tall trees, not like our maples and elms, but more like palms and giant ferns. There they grew in swampy, hot places, drinking in the air and bright sunshine until they became large and closely packed together. Showers of leaves and cones and seeds often fell to the ground; and, finally, the trees and giant ferns themselves, getting old and decayed, tipped over; and the whole tumbled down forest sank lower and lower in the soft, wet earth. Then the sea was allowed to roll in over these fallen forests, bringing with it great quantities of sand and mud or clay, which pressed the huge ferns and other plants into a solid mass, burying them out of sight. And there they lay in the hot, dark place, turning blacker and blacker, and harder and harder as the years went by.

After a long time a new forest began to grow in the earth which had buried the old one. Then when it got large and dense, it decayed and fell down, and the sea rolled in more sand and clay, pressing it into a hard mass. So it went on, forests growing, getting old and falling into the soft earth, then being pressed down by heavy layers of sand. Buried up in the dark where it was so damp and hot, the thick masses of plants were turned into what we call coal, and the layers of sand and clay themselves were pressed into stone or shale.

Sometimes as the moist clay or sand was pressed down hard, it took the picture of some little leaf or plant on which it lay. A little girl was walking one day along the north shore in Colchester County, N. S., and, looking down, she saw a flat piece of grey stone at her feet with a picture of a fern on it. It looked as if the fern-leaf had been laid on and pressed into it until it had made a bed for itself. But the stone was hard. She picked it up and wondered. Could you tell her how that picture got there?

Who digs the coal for us? What do you suppose the inside of a coal-mine is like? Think of a cellar without any windows, then of underground passages from it to other cellars. But a mine is deeper far than any cellar. Imagine ourselves going down a deep, deep well, down, down, down, until we are landed at the foot of the shaft in a hot, dark place, with only a small lamp to show us the way. At first we can scarcely see any thing, but after awhile our eyes get more used to the darkness, and we see the passages and rooms where the coal has been dug out. As we walk along we see the miners hard at work, digging away at the coal-walls with their pickaxes. When some of the coal is loosened and broken up it is shoveled into baskets to be emptied into a car, or it may be shoveled right into the car itself.

We notice the rails laid along the dark passages, and hear the noise of the cars as they run along, some filled with coal on its way to the mouth of the pit, and others returning for more. The rumbling noise near us makes us look up, and we see, away in the distance, a tiny light coming nearer and nearer until presently we find it belongs to a train of coal cars, with a merry-hearted boy for a driver sitting on the edge of the front car and singing at the top of his voice. No steam engines here, only horses to haul the cars. We wonder if the horses are ever home-sick for sunshine and fresh air, for, of course, they cannot go up at night and come down again in the morning as the men and boys do. They must just stay in the dark mine; but plenty of fresh water and good hay is taken down for them.

How does the miner get enough light? He needs both hands for his work, so very often he has a tiny lamp fastened to his cap. Sometimes, however, he has a lantern, which he hangs on some projecting piece of rock or coal; or, he may drive a pickaxe into the wall of coal and use its handle for a hook.

The miner's work often brings him into great danger. There are times when the air gets very bad, so that it is hard for him to breathe, and sometimes great masses of coal fall down suddenly from the roof or the walls, and again, if some one is careless, a fire may break out in the mine.

Down in the Deep, Deep Mine.

"Oh miner, down in the deep, deep mine ;
 Oh miner, down in the dark ;
 Oh miner, with your pickaxe strong,
 You work so hard the whole day long,
 And help to do your part.

You bring us iron so hard and strong,
 And coal to keep us warm,
 And brightly sparkling silver ore,
 And gleaming gold, and even more,
 By working with your arm."

—Selected.

Busy Work.

Fold paper and practise tearing evenly through the creases. After tearing off a number of strips, make them into lamp-lighters for home use.

Narrow strips of paper may be cut or creased and torn evenly into certain given lengths, four-inch, or five-inch pieces, etc. After each piece is torn off, not before, test accuracy by actual measurement. For this purpose the children may have sticks of the given length, or strips of card-board, or a foot-rule. Good pieces may be kept for making paper chains.

Draw pictures of given number of houses, each house having a stated number of windows.

Take impressions of leaves on moist clay. By doing this the children gain a clearer idea of the way in which fossils were formed.

Fold paper caps from memory. (The children should have folded them at least once previously from dictation, as follows:) Use an oblong sheet of paper any size from a small piece 3x4 inches to half a sheet of newspaper which makes a cap large enough for a child's head. Lay the oblong sheet of paper on the desk with the long edges at the right and left. Fold the front edge to the back. (The back edge is the one farthest away.) Without opening, fold the right edge to the left. Now open the last fold and observe the crease made. Fold half of the front edge to this crease. Fold the remainder of the front edge to same crease. Open the paper at the back edge, folding the upper portion towards the front as far as it will go. Fold remaining portion similarly on opposite side of cap. If the edges that extend past the triangular form are now folded over and gummed, the cap will be stronger and of better shape.

Mica has been found a few miles from Yarmouth, Nova Scotia, in considerable quantities.

FOR THE EDUCATIONAL REVIEW.]

Cardboard Work — No. 2.

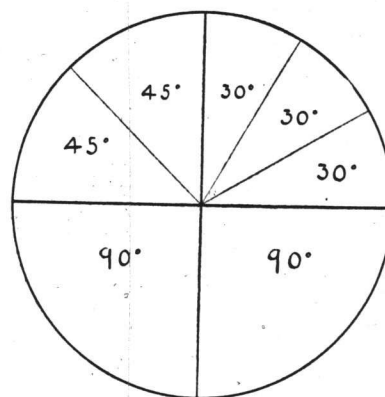
By T. B. KIDNER.

(All rights reserved.)

A little preliminary practice in the manipulation of ruler and set square, and the drawing of lines at right angles, may be required in some cases, but it is better to get the necessary dexterity by drawing *something* rather than a series of practice lines which come to nothing in the end.

The drawing finished, the pieces of card are then distributed. These should be cut about three-quarters of an inch larger each way than the finished exercise. The drawing should then be carefully made on the card, ready for the cutting out. Next, the proper method of holding the scissors should be demonstrated, for a great deal depends on it. The thumb must be placed in the

Figure 2.
 Blackboard diagram used in
 teaching angles &c.



upper loop, the *middle* and *third* finger in lower loop, with the forefinger in front of it. Holding the card in the left hand, open the scissors *wide* and cut steadily forward on the *right* hand side of the figure, steadying the right arm by holding the elbow close to the side. Do not bring the points of the scissors together; better results are obtained by not cutting with them, though the children are apt to do so at first. When the first cut is completed, it is well for the children to hold the card up while the teacher passes rapidly round inspecting the cut, pointing out the weak places and approving of the good, straight edges. The other three sides of the square should then be cut and the complete figure *laid on* the drawing to test its accuracy. Great stress should be put on this feature of the work by the teacher, and from the first no deviation from truth should be accepted by

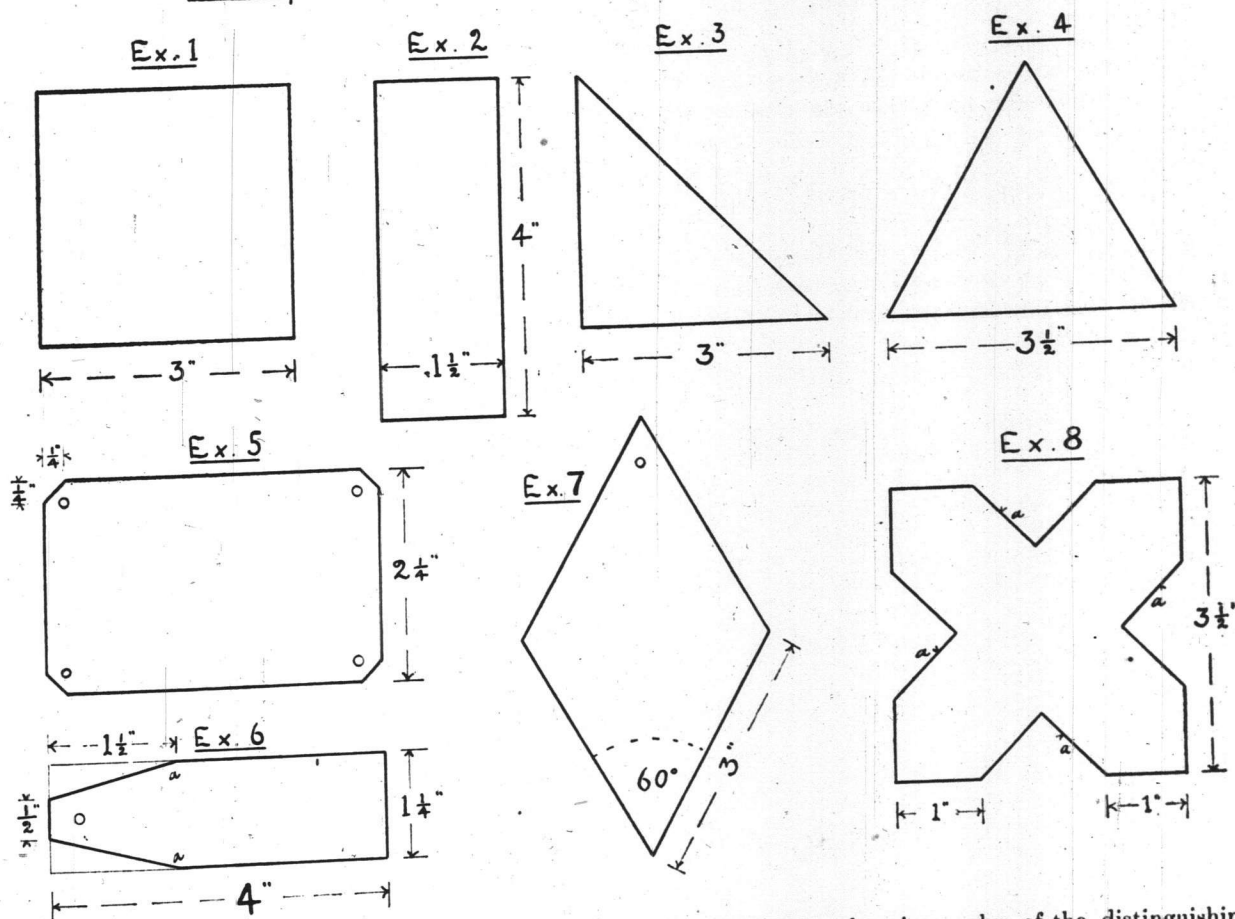
the teacher as satisfactory. The cutting may not at first be all that is desired, but the importance of exactitude in measurement should be insisted on. The names of the children should be neatly written on the cards, and the number of degrees in a right angle also put in one corner.

EXERCISE 2.—The oblong. As each new step is to be from the standpoint of something already accomplished, the oblong card is a fitting exercise to follow No. 1. Commence by getting the children to point out, first, the similarities to the square, and then the differ-

ences from it. The definition may thus be educed and pieced together from the children's answers as in the first exercise. The drawing presents no new features, except that the half inch is introduced. The cutting out is slightly more difficult, owing to the oblong being longer than the edges of No. 1.

new figure is half a square. Reviewing the two previous lessons, there should be little difficulty in getting the children to calculate the number of degrees in a triangle, $90^\circ + 45^\circ + 45^\circ$, as the acute angles are half a right angle. As a piece of information, they may then be told that *all* triangles, whatever their shape, contain 180 degrees. The drawing is simple, but care must be taken to get the sides of the triangle exactly equal. In cutting out, the acute angle will involve an increase of care in commencing the cut along the hypotenuse of the triangle. During the exercise, the meaning of "tri-

The first eight exercises - Marking & cutting.



ences from it. The definition may thus be educed and pieced together from the children's answers as in the first exercise. The drawing presents no new features, except that the half inch is introduced. The cutting out is slightly more difficult, owing to the oblong being longer than the edges of No. 1.

EXERCISE 3.—A right-angled triangle. As the base and perpendicular of this figure are to be made equal, the acute angles will, of course, be 45° . By demonstrating with a large sized triangle, cut out of cardboard, lead the children to see that the

should, of course, be given, also of the distinguishing adjective, "right-angled."

The teaching of angles, degrees, etc., is much assisted by a simple diagram, which should be drawn on the blackboard during the early lessons, and added to from time to time as new angles are introduced. This is shown in Fig. 2, (p. 182) and should at first be formed of the circle and vertical and horizontal lines through its centre, giving four right angles. Four times $90 = 360$, the number of degrees a circle is divided into for the purpose of having a standard to measure angles by.

EXERCISE 4.—An equilateral triangle. Begin by reviewing the last exercise—naming the angles as “right” and “acute,” and eliciting the number of degrees in each, and their sum. “All triangles, remember, have 180° in them.” That being so, the equilateral triangle having equal angles, the number of degrees in each is easily obtained from the children. To draw the figure, first put in a horizontal line for the base, and from its centre erect a perpendicular by the aid of the set square. Next, measure off from one end of the base a distance equal to it, swinging the ruler until it meets the perpendicular line. This will give the apex of the triangle, and the figure is easily completed. The cutting out calls for no special remark.

EXERCISE 5.—A name tablet. This exercise is based on the oblong, and also brings in again, in another form, the 45° right-angled triangle. The oblong should first be drawn with faint lines, then the small triangular pieces measured off, and the actual outline of the tablet lined in. A small ticket punch will be needed for this and many of the following exercises. By a clerical error, this was omitted from the list of appliances last month. Such punches can be obtained for twenty cents each at any stationer's, and are used for punching small, round holes, for various purposes, in the exercises. The position of the holes should be indicated in the drawings by tiny crosses, and it will be seen that in the present exercise they are located by lines joining the corners after the little pieces have been cut off. In cutting, great care must be taken with these corners, for the children are apt to snip them off at random.

EXERCISE 6.—A baggage tag. Another exercise based on the oblong. The drawing is simple, but the cutting of the very acute angles at *a a* needs care, or the tag will be lop-sided. The hole must be carefully marked—half an inch from the end, and at equal distances from each side. The marking of the half inch in the centre of the oblong, to form the end of the tag, gives an opportunity for a little arithmetic. By a little questioning, and perhaps a sketch on the board, the number of eighths in an inch-and-a-quarter can be elicited from the children, and the margin to be cut off on each side, viz., three-eighths, easily obtained.

EXERCISE 7.—The rhombus. By punching a hole in one corner this can be used as a key-label, thus combining the educational and practical, and creating an interest in it from the child's point of view. The properties of the rhombus must be brought out—“a square pushed out of shape”—therefore, it will have four equal sides and two pairs of equal angles. By making its acute angle 60° , the figure is readily drawn by constructing two equilateral triangles about the same base. The cutting out is simple.

EXERCISE 8.—A wool winder. This is based on the square, but involves very accurate measurement to obtain good results. If the oblique lines are parallel, a square is formed in the centre by their intersection, and the portions cut out are also right angles.

It forms a good drawing lesson if taught so that these

points are brought out, as it gives the repetition of *principles*, as well as a variety of form,—an important point in any school work whatsoever.

The cutting of this introduces work with the *point* of the scissors, and also cutting with the scissors held at the left hand of the card, on the edges marked *a a a a* in the drawing. Great care must be taken that the cuts actually meet in the angle, neither going too far or stopping short and leaving a ragged corner.

Manual Training and its Effects Upon Character Building.

BY MISS ELODIE E. BOURQUE, MONCTON, N. B.

No doubt every teacher is trying to observe the good old commandment received upon entering the profession, namely, to aim at the development of the ethical, physical and æsthetic nature of the child as well as of his purely intellectual nature. However, we sometimes find that some of our teachers, excellent in some lines of teaching, are apt to overlook, as it were, an important branch of our curriculum. I refer to manual work. Manual training develops certain faculties of the eye and mind which would otherwise not be called into play. It can also be the means of producing a good effect upon the character.

The teacher who demands neatness and exactness from the pupil in all his habits is building on that child's success in the world. The child will learn to be thorough; and thoroughness often leads to success. What profit would it be for the child if he stores his mind with knowledge and at the same time acquires habits of carelessness. This would not tend to make him a useful citizen. His education would not be well proportioned. We are not accomplished because we know and can do things, but because the value of these things has passed into our character.

Carefulness on the part of the pupils in doing their manual work will bring in its turn two valuable results. In the first place, most of the children will become skilled in manual work, and this is no mean accomplishment. The second, and I believe the most important result of this carefulness, is the good influence which it will have upon their character. The daily effort made by the child to write his lesson well is most beneficial; it is conducive to the forming of good habits. He will also cultivate a love for the right, the good and the beautiful; he will form ideals which he will try to reach. The teacher who succeeds in getting her pupils to take a pride in having their work look well has taught an excellent lesson. The boy who knows how to consider such a worthy trifle as dotting his *i*'s or crossing his *t*'s properly is the boy who promises to become the famous inventor; in the same way, the girl who is neat and tidy in all her duties during child-

hood is following the footprints of the ideal housekeeper and homemaker; and how much of the greatness of our country is due to our good homes!

One division of manual work often neglected in our schools is penmanship. Still this is so important. We know that one of the educational qualifications most helpful upon entering a business life is to be able to write a good, legible hand. If writing has its own value, it is proper that we teachers should understand its teaching, both in theory and in practice. Once we have given certain directions, let us see that they are carried out, and everyone is thereby benefited. For instance, after giving a lesson in writing, we must not suppose that our task is completed, and all we have to do is to idly sit, with folded arms, and watch the class performing. On the contrary, this is the time for training. The thoughtful teacher will go around from pupil to pupil, giving help where it is needed. He will thus come into direct and immediate contact with each individual, and no child, however dull or brilliant, will be overlooked. A good plan is to point, or rather let the child himself point out, the faults by comparing his own work with the model.

Drawing seems to be a stumbling-block for many teachers. Certainly to teach this subject in all its departments, which are so different in their methods of teaching and in the objects to be attained, it would require more time than is generally allowed during school hours. However, by correlating subjects, we can take up the simple courses such as outline drawing, and perhaps a little freehand perspective drawing. Map drawing at its best requires patience, preciseness, besides giving an opportunity to the child of displaying his taste. A short exercise is sufficient to allow pupils to use their will and choose between doing their work as well as possible or else in some careless manner. Let us sing praises to the teacher who succeeds in having her pupils choose right. She has thus built a keystone for their character, since the perfect character is the perfectly controlled will.

I do not suppose that the skilful devices of the active teacher will be a panacea for all the poor manual work found in schools. Sometimes we find children who can not make great progress in this branch of education, no matter how much they try.

Others we will find who have the ability, but are lacking in ambition, and do not even try. Give those to understand that their very best is expected, and nothing else will be accepted. Be scrupulous in supervising not only the copy-books, but all their work, and particularly their home exercises. The work our pupils do after they cease to be under our supervision shows how much good they have derived from our teaching. The teacher who accepts a home exercise scribbled in leadpencil on a sheet of paper, torn from an exercise book, is making a serious mistake. She is undermining any principle of exactness which she might have tried to establish.

It sometimes happens that a school will acquire a love for neatness and preciseness by noticing these qualities in the teacher. Naturally we can expect this. Children must be wonderful imitators, since we have for one of our axioms: As is the teacher, so will the

pupils be. With this in view, let our blackboards be models of neatness and taste. A neat little border or frame in colored chalk sometimes adds much to the appearance of a set of questions or whatever the exercise may be. Once a map or any drawing has lost its former freshness let it be replaced by new ones. I have heard one of our experienced teachers remark that when she renewed the drawings on her blackboards she always noticed an improvement both on the children's slates and in their conduct. Even the appearance of the school-room and grounds in general would tend to elevate the sentiments of the school.

The teacher's highest reward is the satisfaction of knowing that she has done her duty. If we wish to succeed in our work we must be happy in doing it. Ruskin tells us that in order to be happy in our work we must fulfil three conditions: "We must be fit for it; we must not do too much of it; and we must have a sense of success in it, not a doubtful sense such as needs testimony of others for its confirmation, but a sure knowledge that so much has been done well and fruitfully done whatever the world may say or think about it."

Male Teachers for Schools.

Toronto News: The decision of the public school board to fill vacancies in the senior fourth classes in future by male teachers only, will meet with general approval. There can be no question of the wisdom of the move. Experience has shown that after a certain age boys require more masculine moral and intellectual stimulant than a woman is usually able to give them. The whole secret of the matter, we believe, lies in the fact that women seldom understand or can place themselves in sympathy with the boys who are beginning to look forward to manhood. They fail utterly to gain their confidence; and their influence, where it produces results at all, tends to retard rather than assist the right development of character. There are, of course, female teachers who are as successful in bringing out and encouraging the best traits of boys as the most capable male teachers, but they are rare. Women, as a rule, fail to influence larger boys, and to a certain extent, even girls, as men do. They may have the gift of imparting knowledge, and may be able to maintain perfect order in their classes, but in most cases they are quite out of touch with their pupils, purely and simply because they have no sympathy with those boyish characteristics which, under proper training, develop later on into what is called manly character. The influence of women is distinctly feminine, and all experience goes to prove that boys, during the period approaching adolescence need robust, masculine guidance. One objection made to the new measure is its expense. That might be met by separating the boys and girls when they reach the senior fourth book, the girls remaining with lady teachers and men being put in charge of the boys. By such a re-arrangement there would be little, if any, additional cost entailed in carrying out the idea, and substantial advantage would accrue to the pupils.

Teaching Versus Preaching.

BY PROFESSOR WALTER C. MURRAY.

Too frequently our teaching degenerates into preaching. Even the best teachers err in this respect. After the lesson has been explained, they think it necessary to emphasize the moral. This they do in a serious talk, instead of trusting to the suggestion of the story. At this point an observant teacher notices the boys slip away from him. The less troublesome compose themselves in resignation and think of something else; the more energetic grow restless and play tricks on their neighbors. The teacher persists out of a strict sense of duty, although he feels that he is only beating the air. These times of failure are remembered by both teacher and scholars as the unpleasant experiences.

Why do even the best teachers fail here? Is it not because they cease teaching and begin lecturing? Poor teachers who do all the talking, never get control of the attention of their scholars. What they say may be excellent. They themselves may be most worthy persons, yet their very virtues repel the children. Their words of wisdom are called goody-goody talk, and are denied entrance to the youthful mind. The failure is due to the attitude of the would-be teacher to the scholars. The right attitude is more important than method, more important than almost anything else. If the teacher be intelligent, and if he consciously or unconsciously adopt the right attitude of mind, the proper methods will present themselves sooner or later.

The lecturer and the teacher adopt very different attitudes to those whom they instruct. The lecturer talks to an audience—to listeners. He proceeds upon the assumption that those before him are waiting to receive the valuable information that he is to give them. He pours out his learning and they take it in. His work is to diffuse, pour out, useful knowledge. The audience before him is in a receptive mood, is willing, nay eager, to drink in his words of wisdom. Consequently, he tries to present his ideas in the clearest manner possible. His subject is well thought out, clearly reasoned, even to the minutest detail, and is presented as a complete whole. A lecture, like a photograph, should be clear, distinct, and complete.

The teacher's task is quite different. His object is to direct and, if need be, to stimulate the activity of the boy. If, for the present, we neglect moral and physical education, and confine ourselves to the boy's acquaintance with the world in which he lives, we might say that the aim of the teacher is to awaken the boy's curiosity and to guide him in his attempts to satisfy it. The teacher proceeds upon the assumption that the boy is not

a receptacle to be filled, but an activity to be directed. Consequently, his thoughts do not centre about the book to be explained, but about the boy to be taught. He studies the boy's interests, in order to find out the best way to awaken his curiosity about the lesson. He questions him, in order to awaken that curiosity and to lead it by suggestion where it may find satisfaction. He avoids telling him what he could easily find out, for he knows the boy delights in finding out things for himself. The teacher uses the book or the lesson as a tool. Consequently, he tries to adapt the book to the boy, not the boy to the book.

The course of the lesson is very different from that of the lecture. The latter proceeds in an orderly, systematic fashion from start to finish. The lesson, on the other hand, follows the twistings of the boy's mind. The teacher keeps in mind the idea which he wishes the boy to grasp, but he does not feel bound to follow one track to reach his object. He adapts himself to the peculiarities of the boy. It is a rare thing for two boys to reach the same result in exactly the same way. When they do, the lecturer has overcome the teacher and sacrificed some of the boy's interest and the power which he develops in finding things out for himself. The teacher's dependence on the turnings of the mind of the boy forces him to leave many things abruptly and to remain content with an increased interest and the gleam of intelligence that indicates that the boy has grasped the essential thing.

Since, then, the interest of the good teacher centres in the boy, it becomes a matter of great importance for him to study the workings of the boy's mind. He should be as much interested in the ways the boy's mind works as the physician is in his body. The physician studies the body to discover what causes its diseases, how to avoid, and how to cure them. The teacher's concern is not limited to the mind's ills; he wishes to shape it as it grows.

Thring begins one of the chapters in his "Theory and Practice of Teaching" (one of the most suggestive books on education), with a graphic description of the teaching that does not educate. "It is useless pumping into a kettle with the lid on. Pump, pump, pump. The pump handle goes vigorously, the water pours, a virtuous glow of righteous satisfaction beams on the countenance of the pumper; but the kettle remains empty; and will remain empty till the end of time, barring a drop or two which finds its way in unwittingly through the spout." Thring adds: "This is no unfair picture of what is going on in the school-world to a great extent. The whole theory and practice amount to nothing more than a pouring out of knowledge on to the heads underneath."—*The Teacher's Monthly*.

A Children's Page.

ANSWERS TO TWENTY QUESTIONS.

In the December REVIEW twenty questions were given. Partial answers have been sent in by the following five pupils: Clara E. Mahan, Mary M. Ryan and Alice M. Ryan, of Lingan Road, C. B.; Nina Boutilier and Gordon Dauphinee, of Tantallon, Halifax County. The first named pupil answered ten questions correctly out of the twenty. The others did not do so well. Below will be found answers which children should be asked to verify as far as possible:

1. Why has a cat whiskers?

Answer.—To aid its sense of feeling, especially when roaming about in the dark; the whiskers being highly developed nerves protruding in front and at the sides of the cat, as it has occasion to employ them.

2. Do robins and chickens walk alike?

No; robins hop, using both legs simultaneously in a similar motion, while chickens walk by alternately placing one foot in front of the other.

3. How many legs has a garden spider?

Eight.

4. How does an elephant dig?

With his tusks, trunk, and by wallowing.

5. Why does a rabbit wobble its nose?

To remove the mucus and keep its nostrils clear.

6. How does a horse use its legs in trotting?

The left front and the right hind, and the right front and the left hind move forward simultaneously.

7. In what order does a fly move its legs in walking?

In pairs, one on each side, the forward ones being advanced and remaining stationary until the hind ones are brought up.

8. Why is a fish dark in color above and light underneath?

To prevent it from absorbing light, and thus becoming easily distinguishable to its foes, either in the water or above the surface.

9. How many times does a crow fold its wings after alighting?

Three.

10. When sheep get up from lying down, do they rise with their fore or hind legs first?

With their hind legs.

11. Do rabbits run?

No; they hop about, using their hind legs to propel themselves forward.

12. Where is the oyster's mouth?

Beneath a kind of hood formed by the union of the two edges of the mantle near the hinges of the shell.

13. Why do horses turn their ears?

To facilitate the sense of hearing, the ears being turned in the direction whence instinct tells them the sound is coming.

14. How many legs has a house fly?

Six.

15. How can a fly walk on the ceiling?

The feet of the fly are hollow, and when in contact with a plain surface, as a ceiling or window pane, a suction is created which holds them firmly.

16. Which end does a wasp sting with?

Only the female wasp stings, and the stinger is located at the end of the abdomen, the after extremity.

17. Why is a tiger striped, the leopard spotted?

For their better protection, the tiger's stripes aiding it to conceal in the jungle, while the spots perform the same service for the leopard in the trees.

18. Do pigs grunt as an expression of pain or pleasure?

As an expression of pleasure.

19. Do little pigs show any sign of affection for each other?

Yes. Affection is an emotion common to all creatures.

20. What is the difference between the upper and lower sides of the leaf of a fern?

The upper side is smooth and hard after the manner of a shield, while the lower side holds and produces the sori, or fruit dots, which contain spores, by which ferns multiply.

"SILVERTIP."

We are indebted to the courtesy of *St. Nicholas* for permission to publish the following illustrated story which recently appeared in *St. Nicholas League*, a department in the magazine conducted especially for children. The story and illustration, by a boy of twelve years of age, are suggestive:

During our summer vacation at Lake Ripley, Wisconsin, we go for milk to a farm near by. The farmer's wife, Mrs. Black, has several cats. One night, when we went for milk, we found that one of the cats had caught a young cottontail rabbit. We succeeded in getting it away from her, and we took him home.

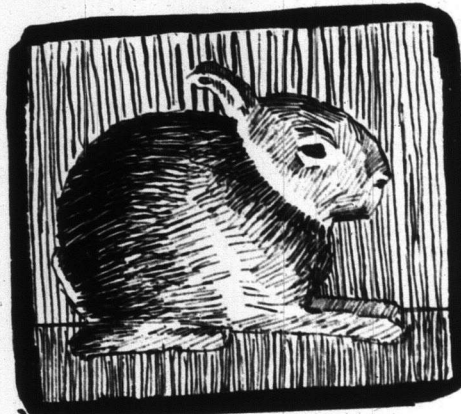
We made him a bed lined with lots of cotton. We named him "Silvertip." He was very tame, and would eat milk from a teaspoon.

When he was hopping around, I drew his picture. He posed perfectly and seemed to know enough to stand still.

One rather cool night, in spite of the best of care, he crawled out of his box, and was so chilled that in the morning he was found dead.

He lies buried under a tree in back of the cottage, and his grave is decorated with ferns and wild flowers. He was mourned much by our family and friends.

We present above one of the drawings which have won prizes in the League. It is loaned us by the publishers of *St. Nicholas*. Young folks who wish to join the League will be supplied with a badge and full instruction on application to the publishers of *St. Nicholas*, Union Square, New York.



BUSY WORK.**ARITHMETIC WORK.**

Copy and finish.

In 1 yard there are ——— feet.

In 2 yards there are ——— feet.

In 1 foot there are ——— inches.

In 2 feet there are ——— inches.

In 3 feet there are ——— inches.

In 1 gallon there are ——— quarts.

In 1 quart there are ——— pints.

In 1 pint there are ——— gills.

In 6 pints there are ——— quarts.

In 8 gills there are ——— pints.

Make up exercises similar to this from other tables.

1. Eleven inches lacks how much of one foot?
2. How many inches, then, in one foot?
3. How many inches in one-half foot?
4. How many inches in one-quarter foot?
5. Draw a line one foot long.
6. Divide it into twelve equal parts; into six equal parts; into four equal parts; into three equal parts; into two equal parts.

7. How many inches in each part?

Make up similar exercises from other tables.

INDUSTRIAL QUESTIONS.

These are not for test purpose, but to awaken an interest in real life to help children to open their eyes.

1. Name three kinds of mechanics.
2. Name five things that you have seen mechanics make or do.
3. Name five articles that you have used that were made by mechanics.
4. Of what use is an anvil?
5. Of what use is a plane?
6. Name two kinds of saws.
7. Name three kinds of nails.
8. Name the kinds of wood used (a) for shingles; (b) for floors; (c) for sleighs; (d) for pianos; (e) for ship building; (f) for dining tables; (g) for writing desks; (h) for blinds; (i) for fences.

9. What wages have you ever known any of these mechanics to receive: (a) blacksmith; (b) carpenter; (c) shipbuilder; (d) miller; (e) machinist; (f) moulder.

10. What hours have you known mechanics to have to work?—*Primary Education.*

If woman would only remember that her influence over a child the first few years of its life can have greater effect, and produce wider and more lasting results than her whole life given up to walking in the ways of men!—*Cardinal Gibbons, in the January Ladies' Home Journal.*

MEMORY GEMS.

The February sunshine steeps your boughs
And tints the buds and swells the leaves within.

BRYANT—*Among the Trees.*

Trials teach us what we are; they dig up the soil, and let us see what we are made of; they just turn up some of the ill weeds on to the surface.

SPURGEON.

To be trusted is a greater compliment than to be loved.

GEORGE MACDONALD.

Dare to be true; nothing can need a lie;
A fault which needs it most, grows two thereby.

HERBERT.

It is as easy to draw back a stone, thrown with force from the hand, as to recall a word once spoken.

MENANDER.

Work first and then rest.

RUSKIN.

Attempt the end, and never stand to doubt;
Nothing's so hard but search will find it out.

HERRICK.

Character is higher than intellect. . . . A great soul will be strong to live, as well as to think.

EMERSON.

A cheerful temper joined with innocence will make beauty attractive, knowledge delightful, and wit good-natured.

ADDISON.

Labor to keep alive in your breast that little spark of celestial fire, called Conscience.

GEORGE WASHINGTON.

Knowledge is the hill which few may wish to climb;
Duty is the path that all may tread.

LEWIS MORRIS.

Ill habits gather by unseen degrees,
As brooks make rivers, rivers run to seas.

IVID—*Metamorphoses.*

Winter Dreams.

Deep lies the snow on wood and fields;
Gray stretches overhead the sky;
The streams, their lips of laughter sealed,
In silence wander slowly by.

Earth slumbers, and her dreams—who knows
But they may sometimes be like ours?—
Lyrics of spring in winter's prose
That sing of buds and leaves and flowers;

Dreams of that day when from the south
Comes April, as at first she came,
To hold the bare twig to her mouth
And blow it into fragrant flame.

—*Frank Dempster Sherman in the February Atlantic.*

I believe that to make a country beautiful will do more than anything else to make its people happy and contented. Nothing will do more to encourage patriotism than to have the surroundings of our homes so attractive that they will be loved and admired.—*O. S. Simonds.*

It is all but useless to plant seeds when the spring-time is gone; the harvest of character must depend in part upon planting the soil in the time of awakening.—*January Ladies' Home Journal.*

CURRENT EVENTS.

In Arizona, where so many remains of a prehistoric civilization have in recent years been found, there is said to exist a wonderful series of ancient waterways that have once been used for irrigation. The region is believed to have been the home of a dense population at a time much more remote than the age of the cliff-dwellers.

The order stating that after fifteen years the English language only would be used as the official language of Malta has been withdrawn, much to the gratification of the small portion of the Maltese people who speak Italian.

Fighting is still going on at the Isthmus of Panama. The Columbian commander, General Alban, was killed in a battle with the insurgents in the harbor of Panama, and there have been other engagements, in which, though the government forces were generally victorious, the revolutionists have shown more strength than was anticipated.

The French company owning the unfinished works of the Panama Canal have offered to sell to the United States for \$40,000,000. It is quite possible that this offer will be accepted, and that the interoceanic canal will yet be constructed by the Panama route, in preference to the Nicaragua route.

The volcano of Colima, Mexico, is again active. This is possibly connected with the fact that earthquake shocks have been felt in various parts of North America within the past few weeks.

According to recent reports, civilization is advancing rapidly among the native races in German East Africa. The people have adopted European dress and manners, even in the interior districts.

Russian engineers are to raise the level of the Sea of Azof by building a dam at Kertch.

A new railway, to rival the Siberian road is proposed. It is to connect Cairo with Shanghai, connecting with the present railway system of India.

Sir Robert Ball, the astronomer, foretells the coming of another glacial period, when great fields of ice will drive all living things from this latitude for thousands of years. This ice age will be brought about by the influence of other planets upon the path of the earth's revolution. It is not, however, to be expected for some thousands of years; so the expectation will not affect the immediate value of property in the temperate zones.

Fishes, according to recent investigators, have a magnetic sense, which resides in the sensitive line or lines running along the sides of the fish, from head to tail. These lateral lines may also, it is held, warn them of the approach of danger, as well as give them the sense of direction.

Prince Henry of Prussia, brother of the Emperor of Germany, is about to visit the United States, and great preparations are being made for his reception.

President Schurman, of Cornell University, the distinguished Canadian who was placed at the head of the United States Philippine commission, declares that the

Philippines must ultimately become an independent nation, and that nothing else can justify the presence of United States forces in the islands.

The newly elected head of the government of Cuba, President Palma, has been for twenty-five years a resident of the state of New York, where, since the outbreak of the last Cuban rebellion, he acted as head of the Cuban junta. His feelings towards the United States, it is thought, will lead him to favor the annexation of Cuba to the neighboring republic.

A thousand New Zealand Maoris have volunteered to do duty anywhere in the British dominion, with the object of relieving a like number of British troops for service in South Africa. The Maoris regret that the British government will not accept the services of two thousand native scouts in South Africa, and have long been eager to show their loyalty to the empire by taking some part in the war.

The Boer officer, Commandant Scheepers, who was taken prisoner in October last, has been tried, condemned and shot for the murder of natives and other crimes.

The Boers in the concentration camps are tired of the useless struggle, and are determined, many of them, to help the British to end it. With this object, General Vilonel, a surrendered burgher, has received permission from Lord Kitchener to raise an additional Boer corps of 1,500 men for the British service.

General Viljoen (pronounced Feelyoon) one of Botha's most able officers, has been taken prisoner; and, in a later engagement, DeWet has lost his last field gun.

The premier of Holland has made overtures to our government looking to negotiations for peace. The Dutch premier has been told that his Majesty's government do not intend to accept the intervention of any foreign power; but that if the Boers themselves wish to open such negotiations there is no reason why they should not do so.

The overland telegraph from South Africa northward has been completed as far as Ujiji, on the eastern shore of Lake Tanganyika. It will be pushed forward down the Nile until it connects at Fashoda with the line now in operation to Khartoum and Alexandria, and will then be one of the longest telegraph lines in the world.

The Canadian canal at Sault Ste. Marie was open to navigation for 246 days last year, during which time 4,204 vessels passed through it.

Canada now ranks third in the list of gold producing countries, with a total output of \$27,000,000 worth in 1900. The total value of all Canada's mineral products for that year was \$63,000,000.

Signor Marconi predicts that the wireless telegraph will be working across the Atlantic in June next.

The Canadian government will ask for appropriations for wireless telegraphy in some places now not connected with cables. It is stated that Greenland, Iceland and the Faroes will soon be connected with Canada by the Marconi system.

The last detachment of the second Canadian Mounted Rifles sailed from Halifax for South Africa on the 28th ult.

SCHOOL AND COLLEGE.

At a concert and social held in Glencoe, Restigouche County, the sum of \$53.50 was raised. A new stove and teacher's desk have been purchased, and the balance will be used to improve the school grounds. COM.

[We shall be glad to hear from our correspondent again, and from others who can record improvements.—EDITOR.]

The principal of the schools at Grafton, N. B., is Mr. Arthur P. Davis. He began his work there after the vacation.

The schools in Kentville, N. S., which had been closed for nearly three months on account of smallpox, resumed work after the Christmas vacation.

Mr. A. B. Boyer, of Carleton County, N. B., entered upon his duties as principal of the superior school at Harcourt, Kent County, at the beginning of the New Year.

We regret that Inspector G. W. Mersereau met with a painful accident early in January, which made it necessary for him to remain at home during the greater part of that month. He is now at work, and during this term the following schools will be visited in order: Derby, Newcastle (ungraded) and Alnwick, Northumberland County; Richibucto and Weldford, Kent County; the ungraded schools and afterwards the graded schools in the remaining parishes of Northumberland County; Bathurst in Gloucester County; and, beginning about the first of June, the parishes of Restigouche County.

Dr. MacCabe, principal of the Ottawa Normal School, spent a pleasant and well-earned vacation in visiting many of the normal schools of the United States.

The school at Prince William, York County, N. B., taught by Miss Beatrice Richards, has raised, by means of a concert, the sum of \$11.00, with which to purchase a set of apparatus, chemicals and minerals for lessons in elementary science. The school at Hatfield's Point, B. F. Johnson, teacher, has procured a similar set. The Prince William school will have a cabinet put up in which to arrange the apparatus and natural history specimens.

The calendar of the Summer School for the Atlantic Provinces will soon be issued containing the course of study, local arrangements and other information for intending students. The authorities and citizens of St. Stephen are preparing to extend a cordial welcome to the school, and there is every prospect that the approaching session will be the most successful in its history. Teachers should inform themselves thoroughly of the objects of the school and its great advantages to themselves. Their work in the future will be greatly stimulated by the fine course of study which the school affords, together with the opportunity for healthful recreation.

If domestic life has its cares and responsibilities—and what life has not?—it also has its sweetness and its consolations, its joys and its benefits, that are infinitely superior to anything that can possibly be obtained in hotels or flats.

'ROUND TABLE TALKS.

F. A. T.—Please solve the following questions:

1. If the hands of a clock indicate 3 o'clock when the proper time is one minute to three, and 4 o'clock when the proper time is half a minute past four, what is the proper time when the hands of this clock coincide between 4 and 5? Academic Arithmetic, Question 5, Ex. 44, p. 125.

2. What is the largest number of trees that can be set in a garden 120 yards square, so that the trees shall be at least 10 yds. apart and not less than 5 yds. from the fence by which the garden is enclosed? Academic Arithmetic, Question 4, Ex. 45, p. 126.

3. The stock in trade of two partners in a tea business consisted of 1020 chests of tea, B's share in the business being $\frac{2}{3}$ of A's. Having agreed to dissolve partnership, B took 900 chests, A took 120 and received \$1050 from B. Tea then rising 16 $\frac{2}{3}$ % in price, each sold his stock. After the sale, what fraction is A's property from this source of B's? Academic Arithmetic, Question 5, Ex. 51, p. 129.

4. Divide \$4941 among A, B and C so that 3 $\frac{1}{2}$ % of A's share, 33% of B's share, and 4 $\frac{1}{2}$ % of C's share may all be equal. Academic Arithmetic, Question 1, Ex. 54, p. 130.

1. True time when clock indicates 3 hrs. is 2 hrs. 59 min. Time from 3 (clock time) to 4.21 $\frac{9}{11}$ (time indicated by clock when hands are together between 4 and 5) is 81 $\frac{9}{11}$ min. (clock time).

60 min. clock time = 61 $\frac{1}{2}$ min. true time.

81 $\frac{9}{11}$ m. clock time = $\frac{61\frac{1}{2} \text{ m.} \times 81\frac{9}{11}}{60} = 83\frac{1}{2}$ of true time.

Adding 83 $\frac{1}{2}$ min. to 2 hrs. 59 min. we get 4 hrs. 22 $\frac{1}{2}$ min.

2. Plant 12 trees and 11 trees alternately for 8 rows. In the remaining space, 5 rows of 12 trees each can be planted. This will make 152 trees.

3. A's share of chests = 540; B's = 480. Since A took 120 chests and \$1050, the value of 360 chests = \$1050, and value of 1 chest = \$2.50.

Value of one chest after increase = \$2.91 $\frac{2}{3}$.

900 chests at \$2.91 $\frac{2}{3}$ = \$2625

120 " 2.91 $\frac{2}{3}$ = 350

B's net receipts were \$2625 - 1050 = \$1575

A's " " 350 + 1050 = 1400

As A's property : B's :: 1400 : 1575

or $\frac{2}{3}$.

4. 3 $\frac{1}{2}$ % of A's = 4 $\frac{1}{2}$ % of B's.

100% (all) of A's = $\frac{4\frac{1}{2}\% \times 100}{3\frac{1}{2}\%} = 128\frac{4}{5}\%$ of C's.

Similarly all of B's = 120% of C's.

A's + B's + C's = \$4941

348 $\frac{4}{5}$ % of C's = \$4941

C's = $\frac{\$4941 \times 100}{348\frac{4}{5}} = \1417.50

M. M.—A man who has a two-acre field, twice as long as it is broad, can sell the whole at 10 cents per sq. ft., or he can sell it in lots of 100 ft. by 30 ft. for \$380 each. Which is more advantageous, and how much? If he sells in building lots, what fraction of the land will remain unsold? Academic Arithmetic, Question 5, Ex. 22, p. 115.

$$\text{Area of field} = 87120 \text{ sq. ft.}$$

$$87120 @ 10c. = \$8712$$

$$\text{Length} \times \text{Breadth} = 87120$$

$$2 \text{ Breadth} \times \text{Breadth} = 87120$$

$$2(\text{Breadth})^2 = 87120$$

$$\therefore \text{Breadth} = 208 + \text{ft.}; \text{Length} = 416 + \text{ft.}$$

By measuring frontage on length, and depth of lots on breadth, we get 26 lots.

$$26 @ \$380 = \$9880; \$9880 - \$8712 = \$1168$$

$$\text{Area of lots, } 78,000 \text{ sq. ft.}; 87120 - 78000 = 9120$$

$$\frac{9120}{87.120} = \frac{38}{363}$$

[The answer to a second question of our correspondent is given above.—EDITOR.]

TEACHER.—What is the weight of a piece of granite 9 ft. 4 in. long, 2 ft. 3 in. wide, and 1 ft. 3 in. thick? (Sp. gr. of granite is 2.72). Academic Arithmetic, Question 4, Ex. 2, p. 27.

$$(9\frac{1}{2} \times 2\frac{3}{4} \times 1\frac{3}{4}) \text{ cu. ft.} \times 62\frac{1}{2} \times 2.72 = 4444.65 \text{ lbs.}$$

[Subscribers sending problems to be answered should write them out in full, as well as the references to page, etc., of the text-book. And do not, if you please, send too many at once; and *only those* that you have failed to work out after repeated efforts.—EDITOR.]

M. R.—Will you please solve for me the following questions in Hamblin Smith's Arithmetic, Examination Paper, page 263, Nos. 125, 138 and 140:

125. How many years' purchase should I give for an estate so as to get $3\frac{1}{2}$ per cent interest for my money?

138. At billiards A can give B 5 points in a game of 50 and C 10 points in a game of 50. How many points can B give C in a game of 90?

140. A level reach in a canal, 14 miles 6 furlongs long and 48 feet broad, is kept up by a lock 80 feet long, 12 feet broad, and having a fall of 8 feet 6 inches, how many barges might pass through the lock before the water in the upper canal was lowered one inch?

$$125. \quad \text{Suppose rental} = \$100$$

$$\text{Then } 3\frac{1}{2}\% \text{ of purchase} = 100$$

$$\text{Whole purchase} = 3000$$

$$\$3000 \div 100 = 30$$

30 years' purchase.

138. Since A can make 50 when B makes 45

And A " 50 " C " 40

" B " 45 " C " 40

And B " 90 " C " 80

" B can give 10 points.

140. Amount of water drawn from canal when water is lowered 1 inch = $(77880 \times 48 \times \frac{1}{12})$ cubic feet.

$$\text{Water in lock} = (80 \times 12 \times 8\frac{1}{2}) \text{ cubic feet.}$$

$$\frac{77880 \times 48 \times \frac{1}{12}}{80 \times 12 \times 8\frac{1}{2}} = 38 +$$

\therefore 38 barges pass through *before* water is lowered one inch.

J. B.—While teaching a school in Havelock, N. B., some years ago, a gentleman who resided close by, one August afternoon, brought into our schoolroom a humming bird, in which he knew we all would be interested. And, after holding it in his hand until we each had a good look at it, he let it go in the room. And as the windows were well opened from the top, we expected to see it go out. But the ceiling was high, and the bird kept constantly upon the wing as high as it could fly. Soon we tried every device we could think of to get it to come down to the open windows, but to no purpose. Next we took recess, all leaving the schoolroom; but still our poor little prisoner never came low enough to find an open window, and never rested. And, at four o'clock, it was still constantly flying backwards and forwards, as it had done all the afternoon. And, by that time, we all were very sorry it had been let go in the house.

We left the doors and windows open until dusk, when they were closed. But, next morning, when we came to school, the poor bird lay dead upon the floor. To all appearance, it had continued flying around the upper part of the room until it dropped dead.

In such a case, what might have been done to save the life of that bird?

It might have been caught in a net.

C. S.—Will you please oblige me by giving answers to the following questions: Which is proper—(1) A hen *sits* or *sits*, (2) The coat *sits* or *sits* well, (3) A *sitting* or a *setting* hen, (4) The sponge has *risen* or the sponge has *raised*, (5) What causes the tides each day, (6) What is the proper name for what some people call "scooch" or "cooch" grass?

1, 2, 3. The intransitive verb *sits* is required in all these cases; as, the hen *sits*; the coat *sits* well; a *sitting* hen. 4. The intransitive *rise* is correct; as, the sponge has *risen*. 5. The attraction of the moon and sun in connection with the rotation of the earth on its axis. (Consult a good dictionary, or a work on geography or astronomy for a fuller explanation). 6. The grass you refer to (*Agropyron repens*) is called *couch grass* from the horizontal position of its root-stocks in the soil; it is also called *quitch* or *quick* grass, probably from its vigorous growth and great tenacity of life, derived from the old meaning of *quick*, living. Compare "quickness and the dead" of the New Testament.

TEACHER.—1. Is it advisable to take up all the mathematical subjects, as algebra, geometry, arithmetic, and also bookkeeping, in one term of the school year, or take some of the branches

in one term and the remainder in the next term? Also, is it better to take up geography and history in the same term or in alternate terms? These questions refer particularly to Grades VIII, IX and X.

2. Should mental arithmetic be graded for the different classes, or is it well to save time and give all the grades the same exercises in mental arithmetic?

3. How often, in the ordinary subjects, should reviews be required?

1. You will find it better to devote the time you allow for mathematical studies mainly to one of the above subjects at a time. On Friday of each week, exercises based on the work they may have previously done in the other subjects should be given to keep the pupils from retrograding in them. Geography and history may alternate, or the geography and history of a country may be taught together.

2. If the time is limited, exercises to promote accuracy and quickness may be given with advantage to more than one class at a time.

3. A review should be taken whenever you find your class is losing hold on facts and principles which are necessary to further progress. But in no case should a review be a mere repetition of former lessons, as that would be dull and uninteresting.

J. B.

NATURALIST.—Can beavers cut through the trunks of very large trees?

H. G. Tyrrell, C. E., in his explorations in North Western Canada found stumps of trees eight inches in diameter cut through by beavers. Prof. W. F. Ganong and G. U. Hay found in Northern New Brunswick white birch trees ten inches in diameter at the point of cutting. Mr. Kilgour Shives, of Campbellton, N. B., has in his possession the section of a tree-trunk, eighteen inches in diameter, cut through by beavers, and says that even larger tree-trunks have been found showing the work of this industrious animal.

M. L. D. —

“Half way down hangs one
That gathers samphire; dreadful trade.
Methinks he seems no bigger than his head.”

SHAKESPEARE'S *King Lear* — Scene VI.

Is the samphire referred to the same as the samphire which grows in the sand along our coasts and on the borders of our tidal rivers, and used as greens?

No; our plant is the marsh samphire (*Salicornia herbacea*) a saline plant with horn-like, fleshy branches. It is an annual. Shakespeare's samphire is a perennial found on rocky cliffs, by the sea shores of England and farther south. The plant was formerly held in high esteem for its pleasant aromatic taste, its qualities as a cordial, and was used for salads and as a pickle.

RECENT BOOKS.

MANUAL OF THE FLORA OF THE NORTHERN STATES AND CANADA. By Nathaniel Lord Britton, Ph. D., Director-in-Chief of the New York Botanical Garden, Emeritus Professor of Botany in Columbia University, etc. Cloth. Pages 1080. Price \$2.50. Henry Holt & Company, New York, 1901.

Students of botany throughout the north-eastern states and Canada will look upon this new manual with mingled feelings. The area is rather more extended than that embraced in Gray's Flora, covering more of the west both in the United States and Canada; the descriptions, in smaller type, are somewhat fuller, with a wider range of localities than in Gray; all measurements are given in the metric system; order and family are not regarded as synonymous terms; and instead of beginning with the Ranunculaceæ and ending with the higher Cryptogams, the new manual begins with the ferns and their allies and ends with the Compositeæ,—an arrangement of orders and families proceeding from the simple to the complex. But the sweeping change is that made in the scientific names of plants. The student will look in vain for many familiar names, nor will the book or index help him much in his search for the departed, unless he is fortunate enough to possess the author's three-volumed “Illustrated Flora.”

One would wish that we may henceforth be spared the lack of stability in the scientific names of plants. We do not pretend to understand the principles of nomenclature, but we do know that if names are unstable and liable to frequent change the result is confusion and waste. Unanimity, it would seem, is wisdom here. The principles of nomenclature adopted in the present manual are those of the botanists of the American Association for the Advancement of Science, and these are essentially the same as those adopted by the International Congress of Botanists held in Paris in 1867. It would, therefore, appear wise for the individual opponents of the new nomenclature to lay aside their own preferences and adopt, for the general good, the broader and doubtless well considered scheme.

The new manual is convenient in size for field work. Its descriptions are as free as possible from technical language. One is struck on glancing over the book with the multiplication of new species. For instance the genus *Viola*, which in the later editions of Gray's manual embraced eighteen species and nine varieties, now includes forty-three species and four varieties. An excellent feature is the association with each species described in the manual of one or more English, or common, names, chosen in reference to some distinctive feature of the plant.

ENGLISH LITERATURE. By Stopford A. Brooke, M. A. Cloth. Pages 358. Price 75 cents. The Copp Clark Company, Ltd., Toronto.

Brooke's “English Literature” has become a national classic. For the past twenty-five years it has been the favorite of students and instructors from the time it appeared as a primer to the present more ambitious volume, embracing the revision and additions of 1896, and four chapters (IX-XII) by Mr. Geo. R. Carpenter, of Columbia University, bringing the account of English literature up to the present time. Two of these chapters are devoted to prose and poetry in the United States. The publishers would have won the lasting gratitude of Canadian students if they had added an appendix, showing the beginnings of a Canadian literature. Have we not Howe, Haliburton, Dawson and others to begin with, and names of more recent date that have won some renown in the world of English letters? We hope that the enterprising publishers, who have done so much for the reading public of Canada, will soon bring out a second edition of this book supplying this needed addition.

BRIEF BIOGRAPHIES, Supplementing Canadian History. By J. O. Miller, M. A., Principal of Ridley College. Cloth. Pages 152. Price 35 cents. The Copp Clark Company, Ltd., Toronto.

These sketches of eminent discoverers in America, men and women who have assisted to make Canada, are intended not only to stimulate the interest of the boys and girls of the schools in the history of the country, but also to provide them with materials and suggestions for essay-writing. The contents embrace sketches of twenty-one characters from Columbus to Laura Secord. The achievements of these heroes and heroines are told in graphic and interesting language.

SEASIDE AND WAYSIDE NATURE READERS By Julia MacNair Wright. No. III. Cloth. 288 pages. Illustrated. Price 45 cents. Publishers, D. C. Heath & Co., Boston.

A revision of these admirable readers—four in number—has recently been made after fifteen years of usefulness. No series of readers has been so helpful to young children in giving them an interest in nature. They tell of the homes with many rooms in them which hang in the branches of the trees; of the "little bugs" that hunt and fish, make paper, saw wood, are masons and weavers; of flowers and trees and how they have gone into business with insects and birds as partners to feed the world; of the "Fin Family" in the brooks, ponds, rivers and seas; of the shells and curious treasures which the ocean waves bring to the shore; and of world life in its various aspects and periods.

PRACTICAL CHEMISTRY. By R. Abegg and W. Hertz, University of Breslau. Translated by H. T. Calvert, B. Sc., London. Cloth. Pages 118. Price 6s. Macmillan & Co., London. The Copp Clark Co., Ltd., Toronto.

This guide-book for beginners is based on modern physical chemistry and contains the most advanced views and methods of study. Its tables, exercises and directions for laboratory practice render it particularly valuable for the student.

HYGIENE FOR STUDENTS. By Edward F. Willoughby, M. D., London. Cloth. Pages 563. Price 4s. 6d. Macmillan & Co., London. The Copp Clark Co., Ltd., Toronto.

This useful book may be regarded as a complete manual of the principles and practice of public health, based on the latest scientific knowledge in regard to foods, stimulants, clothing, exercise, dwellings, ventilation, drainage, disease, school buildings, occupations, etc., with chapters on vital statistics, meteorology and many other subjects which come within the range of public health and safety.

AMERICA'S STORY FOR AMERICAN CHILDREN, No. V. By Mara L. Pratt. Cloth. Pages 172. D. C. Heath & Co., Boston.

This series, published in five beautiful illustrated volumes, is designed to prepare for the regular study of United States history and to supplement it. The books present in vivid and familiar style pictures of prominent events and persons of the past, and are full of picturesque incidents which attract and hold the interest of children.

Theodor Storm's **IMMENSEE.** Edited with Introduction and Notes, by Richard Alexander von Minckwitz and Anne Crombie Wilder. Cloth. Pages 89. Mailing price 50 cents. Ginn & Company, Boston.

In his "Immensee," Storm has laid before us an idyl both charming in form and pure in thought. The notes are brief and to the point: the vocabulary is arranged in the most practical and modern style.

ALGEBRAICAL EXAMPLES. By H. S. Hall, M. A. Cloth. Pages 172. Price 2s. Macmillan & Co., London. The Copp Clark Company, Ltd., Toronto.

This little book is intended to supplement the exercises in Hall & Knight's Algebra for Beginners, and the Elementary Algebra as far as quadratic equations. It will also be found useful for teachers who wish for a series of graduated examples separated from the text.

ELEMENTS AND NOTATION OF MUSIC. By James M. McLaughlin, Director of Music in the Boston Public Schools. Flexible cloth. Pages 124. Mailing price 55 cents. Ginn & Co., Boston.

This is a manual of elementary theory for teachers and students of vocal-music reading. The general arrangement of its subject-matter, its progressive treatise on the primary essentials of musical knowledge preparatory to the study of harmony, its numerous notational and other illustrations, its comprehensive index, and its question section, make it at once a valuable reference book to every teacher of vocal music, and a desirable textbook in all classes wherein the theory of music is systematically taught.

DOMESTIC ECONOMY. By Ethel R. Lush. Cloth. Pages 251. Price 2s. 6d. Macmillan & Co., London. The Copp Clark Company, Ltd., Toronto.

This book has been compiled to meet the requirements of students for the King's Scholarship examination and the certificate examination of the Board of Education, London. The chapters on hygiene and household management deal with the subject on modern scientific lines, and the book, abundantly illustrated and neatly printed, will be found useful for students everywhere.

HERBARIUM AND PLANT DESCRIPTION, with directions for collecting, pressing and mounting specimens. By W. H. D. Meier, Superintendent of Schools, Griggsville, Ill. Portfolio containing 25 sheets for description and preservation of specimens. Mailing price, 70 cents.

Meier's "Herbarium," consists of a cover holding twenty-five sheets for the mounting of pressed specimens, with directions for collecting, pressing and mounting. The sheets are so arranged that the pressed plant appears side by side with the notes and drawings of the fresh specimen, so that comparison may easily be made.

MACMILLAN'S NEW GEOGRAPHY READER, "America," and "A Country Reader," (Macmillan & Co., London) previously noticed in these columns, may be obtained from the Copp Clark Company, Ltd., Toronto.

HEATH'S MODERN LANGUAGE SERIES: Storm's *In St. Jurgen*; Heyse's *Niels mit der offenen Hand*; Korner's *Zriny*. D. C. Heath & Co., Boston.

These neat little textbooks for first year students in German, costing 30 cents each, are provided with careful notes and vocabulary. They are masterpieces of their authors, written in easy and simple style, and the stories cannot fail to interest young readers.

Daudet's *Le Petit Chose*; *Mon Oncle et mon Cure*. These are abridgements of two attractive French stories. The first abounds in choice descriptions of natural scenery, manners and customs, interspersed with bits of humor and pathos. The second is an interesting character sketch written in bright idiomatic, but simple, language. It abounds in quaint colloquialisms and clever allusions to the studies pursued by the heroine of the story under the guidance of her clerical tutor.

Spanish teachers and readers will be interested in the issue by the same publishers of one of Echegaray's masterpieces of the drama, *O Locura o Santidad* (madness or saintliness), edited with notes by Professors Geddes and Josselyn, of Boston University. Price 40 cents.

SIEPMANN'S ELEMENTARY GERMAN SERIES. Goebel's *Hermann der Cherusker*. Edited by J. Esser. Cloth. Pages 163. Price 2s. Macmillan & Co., London.

This series, as we have noticed before, introduces a number of works by distinguished German authors, not well known in England. This book, as well as the excellent ones of the series previously published, contain graduated and wisely arranged reading matter for students.

ENGLISH WORDS: A Textbook for Schools and Colleges. By Edwin W. Chubb, Litt. D., Professor of English in Ohio University. Cloth. Pages 192. Price 75 cents. C. W. Bardeen, Syracuse, N. Y.

This book presents many observations and lessons on English words, mingled with interesting reflections upon them by the author.

FEBRUARY MAGAZINES.

In the *Atlantic* the editor furnishes a timely discussion of the relations between College Professors and the Public; Edward Thomas contributes one of his delightfully descriptive papers on February in England, and A. C. Lane writes a sparkling article on Universal Eminence. . . . Under the title The Story of Home Gardens, the movement in Cleveland which has had for its object the beautifying of home surroundings and especially the advocacy of Home Gardens, is described in *The Outlook* magazine number for February, in a most interesting way by Star Cadwallader. The illustration and decoration of the article make it particularly effective. . . . A novel feature of the Year of American Humor in the *Century* is The Book-Agent, Miss Herford's first contribution to magazine literature, and decorated by Oliver Herford. Other humorous tales are The Don't Hurry Club by Albert Bigelow Paine, A Government of the People, a story of Oklahoma, by J. W. Piercy. There is

an account of Artemus Ward at Springfield, Mass., besides other sketches and poems—in all ten articles. . . . In *St. Nicholas* Old Strategy is a story of the hunting of mountain lions—a sport made popular by President Roosevelt's yet recent hunting trip in the West. This story is in praise of some big dogs who had learned to fight mountain lions so skilfully that one of them was known by the name "Old Strategy," and gives title to the story. To the children themselves the departments of the magazine offer great attractions, there being awards of prizes in three out of the four departments. . . . Civilization is having its effect upon the Indian papoose as well as upon the warrior and medicine man, says W. R. Draper, in *The Delineator* for February. In a few years more there will be no more little full-blood babies, so fast is the extinction of the red race being accomplished. And when the redskin children are no more, the West will note the absence of its most stoical little Americans, the most picturesque of all babies. . . . Physical Education Applied to Housework, is the subject of the current instalment of The Chautauquan Reading Course for Housewives in the February *Chautauquan*. Illustrations of correct and incorrect ways of doing housework add to the value of this article. . . . An article on Marconi, a new serial and other noteworthy features, make the February *Canadian Magazine* decidedly attractive. The Hon. J. W. Longley traces Canada's Religious Development, and protests against assuming from the statistics of ecclesiasticism that religion has developed. Mr Longley thinks people are not so devout and religious today as they were a century ago. Norman Patterson describes the famous tidal bore at Moncton; and M. O. Scott writes of the changing aspect of Sable Island. . . . The *Journal of Geography*, consolidating The Journal of School Geography and the Bulletin of the American Bureau of Geography, has been received. It is an illustrative magazine of over fifty pages, devoted to the advancement of geographic education. It makes a creditable appearance, and will prove a boon to students.

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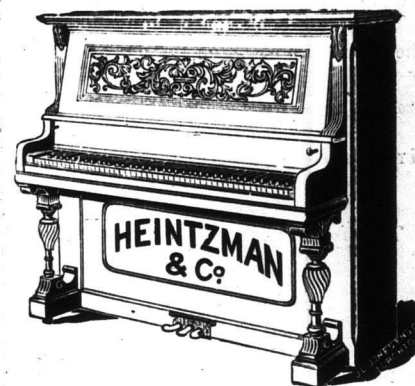
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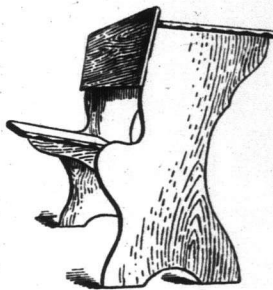
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