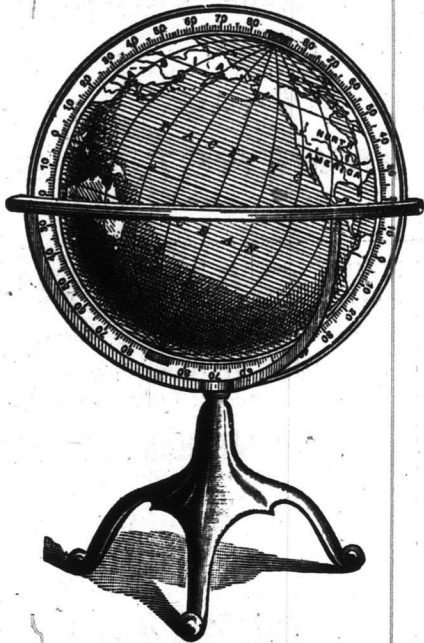


THE EDUCATIONAL REVIEW

VOL. XX. No. 9.

ST. JOHN, N. B., FEBRUARY, 1907.

WHOLE NUMBER, 237.



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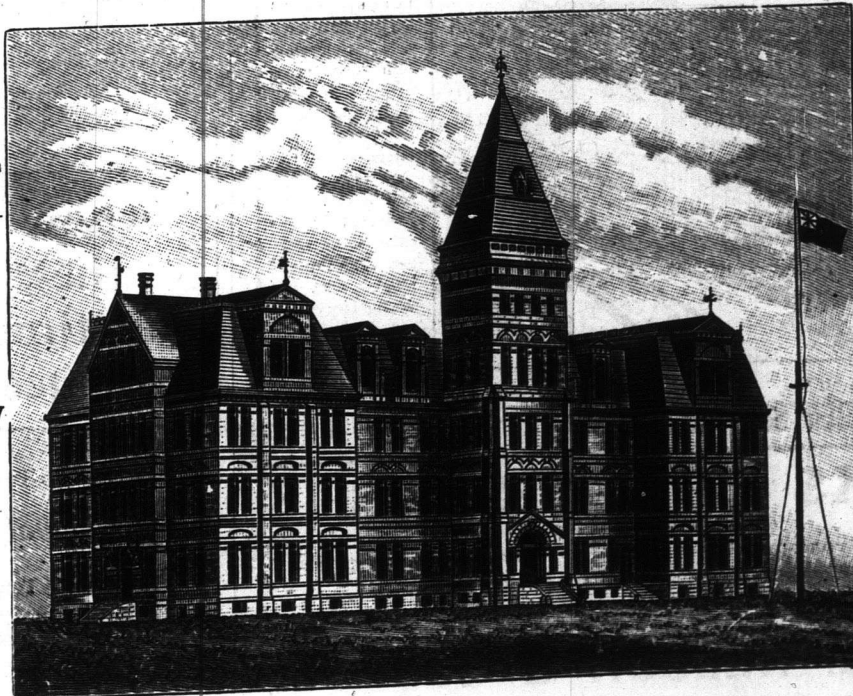
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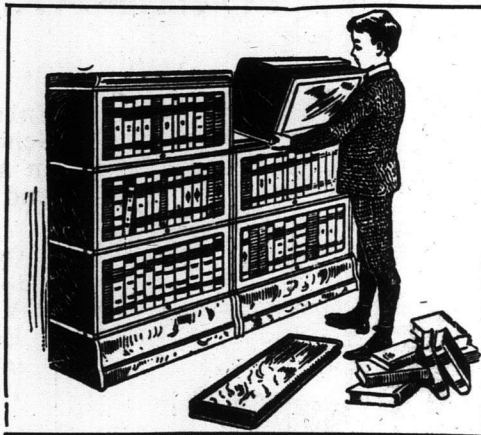
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St. John, N. B.

THE REVIEW regrets, owing to a cause not foreseen in time to remedy, that no picture is sent out with this month's number. The March REVIEW will contain the usual attractive picture supplement.

THE seventh annual meeting of the Canadian Association for the Prevention of Consumption and other forms of Tuberculosis will be held in Ottawa the 13th and 14th of March next. A public meeting of the members of the association and of the citizens generally, at which His Excellency will preside, will be held at the Assembly Hall of the normal school, Ottawa, Wednesday evening, March 13th, at which Dr. Sheard, the chairman of the Ontario Provincial Board of Health, will deliver a lecture upon "Home Treatment of Consumption."

A daily paper is in error when it refers, in bold headlines, to Supt. Dr. A. H. MacKay, of Nova Scotia as a recent convert to simplified spelling. Supt. MacKay has been an advocate of reformed spelling for a quarter of a century past. It is but just to say, however, that in practice Dr. MacKay is still in the ranks of conservative spellers.

THE Dominion Educational Association will meet in Toronto, July 9-12 of this year. The programme is now being arranged, and the readers of the REVIEW will be kept posted on the details of the meeting in future numbers. Special railway rates will be secured. The meeting promises to be one of great interest. Principal W. A. McIntyre, of Winnipeg, is the president, and Dr. D. J. Goggin, Toronto, the secretary.

SOME months ago the REVIEW received a large number of subscribers, each one of whom was to pay his or her subscription directly to the office at a certain specified time. It is a pleasure to note that the agreement was faithfully kept in nearly every case. This is mentioned simply as a matter of recognition on the part of the REVIEW toward these teachers, not as a measure of justice to them. The word of a teacher should be as good as a bond.

THE January number of *Acadiensis*, beginning Volume VII, is one of the most interesting numbers yet published of that magazine so ably conducted by Mr. D. Russell Jack. It is full of valuable historical articles, prominent among which is the History of Pokemouche, one of a series of North Shore (N. B.) Settlements, by Professor W. F. Ganong. The spirit of the author is admirably shown in these words, to which we would invite the attention of all desirous of rescuing fragments of our local history from oblivion: "It is my aim to collect the essential facts while yet there is time, and to preserve them thus for the future generations of New Brunswick men and women who will care for these things."

THE REVIEW is indebted to Mr. G. F. Chipman, formerly a teacher of Canning, N. S., now on the staff of the *Winnipeg Free Press*, for extracts containing late educational news of the Prairie provinces. There seems to be a strong demand there among school boards and inspectors for compulsory attendance. Nor do they stop there. If there is to be compulsory attendance of schools, there must be schools worth the attending, and ample provision for all the children. Many advocates of compulsory education forget this corollary.

Better Salaries.

From all parts of Canada comes a strong protest against the injustice of the present meagre salaries of teachers. The *Free Press* of Winnipeg, one of the most influential papers in Canada, has recently devoted considerable space to the subject and has strongly emphasized the pressing need of more remunerative pay. At the close of the Normal school recently in that city, Principal W. A. McIntyre, after showing the insufficient salaries of teachers compared with other wage earners, said:

"I am not complaining that the salaries of beginners are not high enough. They are often too high. Some teachers are worth \$500 a year less than nothing. The pity is that we should be forced to supply them. But the complaint is that higher qualification and length of service are ignored.

"The only remedy possible is, (1) That the municipal and legislative grants shall be graded, so that service and experience shall be recognized; (2) That the local school board shall give way to the municipal school board."

Principal McIntyre brought forward several instances to show that the novice in teaching is almost as well remunerated as the teacher of experience. It is much the same in the east.

While a novice may occasionally be worth more than the one who has had a long experience, it must be that service and experience, with some teaching ability to start with, are the only true standards to gauge advancement. And to make teaching a profession that shall attract and retain the best talent it is necessary to recognize that the central fact in the school system is the teacher, and that remuneration should advance in proportion as the teacher advances.

A superintendent of schools draws attention to the fact that \$600 ten years ago had the purchasing power that \$750 has to-day. But in spite of twenty-five per cent increase in the cost of living, teachers' salaries have not increased. A teacher complained recently in the *St. John Daily Telegraph* that few

women teachers in that city get more than \$300 a year, a sum that is no way adequate to secure a respectable living. There are many—perhaps more than half—of the teachers in the Maritime Provinces who do not get that much. Is this justice? Governments, school boards and parents should think of it, and exert themselves to remedy a matter that will soon grow to be intolerable. Comfortable living salaries should be the measure of appreciation that people render to good teachers for their services. It is admitted that teachers do not work for salary alone; but it is a mean thing for people to impose on them because they teach from a sense of duty.

A New Drawing Course.

The announcement, contained in recent numbers of the REVIEW, that the Board of Education had prescribed a New Brunswick edition of Augsburg's Drawing Course, must have been hailed with satisfaction by the teachers of the province. The absence hitherto of a graded and suitable course in drawing has been one of the greatest wants in the schools of New Brunswick. Thanks to the efforts of the Board of Education and Mr. H. H. Hagerman, of the Normal school, who has revised Augsburg's graded practice books and made them suitable to our needs, the teachers and pupils have a system of drawing which, with some enthusiasm and endeavor, should produce excellent results.

Augsburg's Drawing System is embraced in three books, and is designed for use in graded and ungraded schools. Each subject is treated topically and is arranged so as to give the widest latitude and the greatest flexibility in teaching.

Book I is a teacher's hand book, showing simple and effective methods of teaching drawing, including color work, in the first, second and third grades. An additional book on drawing with colored crayons is published with the set.

Book II is a regular text-book, containing the essentials of free hand drawing. It may be placed in the hands of the pupils of the fourth, fifth, sixth, seventh and eighth grades, and used the same as a text-book in arithmetic or other subjects. It may also be used in connection with a system of copy or blank books or drawing pads.

Book III contains short, yet complete, courses in brush drawing, wash drawing, water color drawing, pen drawing, the drawing of the human head and figure, decorative design and constructive drawing.

The practice books are designed for pupils of the earlier grades, but until some facility in drawing is acquired they may be used as far as grade eight. A set of cards, to aid in the teaching of action

drawing in the primary grades, form a valuable addition to the course.

The books are published by the Educational Publishing Company of Boston, and are for sale by C. W. Hall, Fredericton, to whom orders should be sent.

Color in February.

Some day after a snow storm we want you to try to see color in the landscape. Do you think an artist would paint a snow scene perfectly white? What colors do you see in the shadow of the tree trunks? Look at the tracks you made across the yard or field; can you see any color in them? Do not be discouraged if you fail in the first attempt. Look often and at different times in the day.

Perhaps in your school work, you have painted trees trying to represent the fresh green of spring, the rich color of summer, or the bright tints of autumn. Did you ever think to look for color in the bare trunks and branches of the trees in winter? See that mass of trees at a distance; another nearer by. Look in the morning, in the middle of the day, and just at sunset. Look on a bright day and on a "gray day." What colors do you see? Are they always the same? Watch the changes in the color of the twigs as spring comes on.—*Abbie E. Comstock.*

About Plans.

The following, taken from an exchange, shows that there is nothing like a good brisk walk in the open air to form and perfect plans for the school-room:

"She's an earnest soul with a determined face. She is on her way to school where a room full of eager faces are in waiting. Over an unprotected rough country road she is walking, with her head full of thoughts on a perplexing problem. Mary is a firm believer in a plan before she attempts to work. This walk of a mile has cleansed her lungs. The peach bloom is in her cheek and there's a sparkle and lustre in her eyes which show she is happy in the thought that she's going to help somebody. In spite of thirty daily recitations, in spite of the poor equipments, in spite of the lack of co-operation of trustees and patrons, Mary resolves that on this very day the plan must be tried."

Gross ignorance is 144 times as bad as just ordinary ignorance.

Glimpses into Schoolrooms—II.

BY THE EDITOR.

It was a country school,—not in a poor district, nor by any means a wealthy one. The children were plainly but neatly dressed. This caused me to look at the teacher. Attired in a plain grey dress, a neat white collar with a touch of red about her throat, her hair attractively arranged,—suggested that the girls had found in her a pattern of neatness. Her quiet orderly movements also suggested the cause of the good order which prevailed in the schoolroom.

As I approached the building a few minutes before, I noticed some boys and girls hurrying towards the entrance, talking and laughing as they went. They bade me a quiet, pleasant "Good morning," as they passed. There was no loitering at the door. They entered quietly as if impressed with the notion that serious work was before them, and that they intended to be partners in it. The teacher had been writing at the board when I entered, and stepped forward to welcome me as an old friend, assigned me a seat, and continued her work. The scholars did not stare at me; they looked, indeed, in my direction; a few to whom I was known gave me a pleasant smile and a nod of recognition which made me feel quite at home. They seemed to be all busy at something, and cast frequent looks at what the teacher was writing on the board.

A touch of the bell and instantly all filed to their seats, quietly, and with no show of doing anything in a way different from their usual custom. The teacher introduced me to the school, but did not ask me to make an address. Instead—a much better custom—we talked easily a few moments on off-hand topics such as the bright morning, the school and attendance. In this brief conversation the scholars joined, not obtrusively, but in response to some remark or question of the teacher. In short, they conducted themselves as well-behaved people do on such occasions; and they seemed like one happy family.

One of the familiar Psalms was read; another—the twenty-third—was recited in unison; the teacher in a few short simple words asked for a blessing on the day's work; and the school sang two stanzas of "My Own Canadian Home."

"This is our morning for Canadian history," said the teacher, turning to me. "We always have a little song, appropriate if possible, before we take up each lesson."

An excellent plan, I thought.

"But do you always begin the day with Canadian History?"

"Not always. In fact we change the order of our lessons nearly every week. Sometimes we take arithmetic first; sometimes a language lesson; and sometimes a nature-lesson, which the scholars always enjoy, as it gives them the opportunity to recall what they have seen in their walk to school, while it is yet fresh in their minds. Then this changing about relieves the work of monotony, and the scholars seem to enjoy the lessons better."

"History is very often a tedious subject for children," I ventured to suggest, but careful to speak loud enough so that the scholars should hear. A smile of incredulity passed over some faces; in others the eyes actually twinkled with ill-concealed merriment.

"It is not so here, I am happy to say. We find history one of our most interesting subjects," said the teacher quietly; and approving nods came from every quarter of the room.

Turning to the blackboard in the rear of the platform she said, "Here we have an outline map of Eastern Canada which I draw afresh for every lesson. It only takes a few moments; and you see we have none too much blackboard space. Then we have here certain dates, 1492, 1497, 1534, 1579, 1604, suggesting names of explorers in Canada. These dates and the outline map suggest the basis of the early exploration of Eastern Canada. As we study each explorer we draw lines on the map with colored crayon, following his line of travel, using different colors for different explorers. In order to fix the travels of explorers in their minds after we have gone over them in class, I give one explorer to each child and have him look up all the facts possible, from pictures, books, and conversation at home, about his dress, looks, birthplace, the style of vessel, crew, etc. Then I call upon him in class and he tells the story as though he himself were the explorer. If he can dress himself, or at least wear some token to make his personation the more real, so much the more vivid is his narrative.

"You would hardly believe," said the teacher, her animated face turned to me, "how interested the boys and girls are in these exercises. A few days ago as they were starting off on a snow-shoe tramp after school, one of them said, 'Come, let us be Columbuses, Cartiers, and Champlains today, and go to places where we have never been before.'

"Sometimes when we have a few minutes to spare

at the close of a lesson, one scholar volunteers to represent Cartier or some other explorer, and he is ready to answer questions about the Indians, or other experiences he has met in coasting along the eastern shore of New Brunswick or up the St. Lawrence river.

"Some days, to vary the lesson, we take the history as a reading book, and a few paragraphs are read in turn followed by questions and explanations. The pupils very often volunteer information that they have gained from other books or from conversations at home; and the lesson is conducted in a free and easy manner.

"We are always on the lookout for pictures of persons and scenes in Canada, which may be cut from illustrated papers, calendars, tourists' guides, magazines, etc. These we mount on cardboard or manila paper and distribute to the members of the class. If a pupil finds out a good deal about a picture or writes a very good story on it, he is allowed to keep the picture as his own on condition that he is to bring it to the class on any day it may be required for general use.

"We have a good way, I think, of allowing a member of the class to put a question on the board each day, of his or her own devising, indicating where or in what book the answer may be found. Each pupil is expected to look up the answers. One question the other day caused considerable searching and trouble before it was answered: 'Who sailed to Newfoundland in the ship called the Golden Hind?'

"Oh, there is no end to the interest which can be aroused in a history lesson," said this enthusiastic teacher. "The scholars are not required to memorize anything; but they remember everything." And the proof was in the lesson that followed.

"May I come in again, Miss ——?"

"Oh, yes, we shall always be glad to see you."

The day before St. Valentine's, draw on the blackboard, or get some one to do it for you after school hours, a large valentine; heart-shaped is the prettiest. Decorate it in colors according to your taste, and write on it, in ornamental lettering, "To my school, from its teacher." Then watch the faces of the children as they file into the schoolroom the next morning. I know how they will look, for I tried the effect of a blackboard valentine upon my pupils.

—*Hints and Helps for the Schoolroom.*

February and Its Noted Days.

ELEANOR ROBINSON.

The name of February is derived from the Latin verb *februare*, to purify; or from *Februa*, the Roman festival of purification, which was celebrated during this month. The old sayings and proverbs concerning February and its weather commemorate it as a moist month, and also betray the superstition that a fine February augurs ill for the weather to come. For example:

"All the months in the year
Curse a fair Februeer."

"If Candlemass Day be cold and clear,
The worst of the winter is yet to appear."

A German proverb says that the shepherd would rather see a wolf enter his stable on Candlemas day than the sun. Another German saying is that the badger looks out of his hole on Candlemas day, but if he sees the sun he goes back.

"February, fill the dyke
Either with the black or white."

—is an English saying, and the poet Spenser writes:

"Then came old February, sitting
In an old wagon, for he could not ride,
Drawn by two fishes, for the season fitting,
Which through the flood before did softly slide,
And swam away."

The second of February, commonly called Candlemas day, is a church festival, commemorating the events recorded in the second chapter of St. Luke's gospel, the presentation of Christ in the temple, and the purification of the Virgin. The popular name keeps in memory a very ancient custom, that of walking in procession with candles, and singing hymns. A description of this ceremony is given by a writer of the twelfth century, as follows:

"We go in procession, two by two, carrying candles in our hands, which are lighted, not at a common fire, but at a fire first blessed in the church by a bishop. They that go out first, return last; and in the way we sing, 'Great is the glory of the Lord.' We go two by two in commendation of charity and a social life; for so our Saviour sent out His disciples. We carry lights in our hands; first, to signify that our light should shine before men; secondly, this we do this day especially in memory of the Wise Virgins that went to meet their Lord with their lamps lit and burning. And from this usage and the many lights set up in the church this day it is called Candelaria, or Candlemas. Because our works should all be done in the holy fire of charity, therefore the candles are lit with holy fire. That they go out first return last, to teach humility, in honour preferring one another. Because God loveth a cheerful giver, therefore we sing in the way."

In 1539, King Henry VIII proclaimed:

"On Candlemas Day it shall be declared that the bearing of candles is done in memory of Christ, the spiritual light, whom Simeon did prophesy, as it is read in church that day."

In the time of Charles I, when candles were brought in at nightfall, people would say, "God send us the Light of Heaven."

In Scotland, Candlemas day is one of the four quarter days. It was an old custom in that country for children attending school to make small offerings of money to their school masters on that day. The boy and girl making the largest gifts were chosen king and queen of the day; a holiday was given, a procession, led by the king and queen, and a bonfire lighted, called the "Candlemas blaze."

The snowdrop, which appears in England about this time, is called the "purification flower," and also the "Fair Maid of February." Tennyson's St. Agnes prays:

"Make thou my spirit pure and clear,
As are the frosty skies,
Or this first snowdrop of the year
That in my bosom lies."

The teachers of the early church had a wise plan of substituting Christian festivals for heathen ones, and, where it was possible, even allowing the newly made converts to follow the old customs by giving them a Christian meaning. It is generally thought that the observance of Candlemas day is an instance of this. February was the Roman month of purification, and an especial feast was the Lupercalia, held on February fifteenth (see Julius Cæsar, Act I, Sc. I, line 72), and one of the rites of this festival was the lighting of candles in reference to those used by the goddess Ceres when she was seeking her daughter Proserpina. The ceremonies also included a drawing of lots by the young men and women, and this is supposed to be the origin of the old custom of drawing lots for Valentines on the fourteenth of the month. Pepys tells us in his Diary how this fashion was followed in England. Each gentleman was expected to give treats and presents to the lady whose name he drew and whose Valentine he was. On February 22nd, 1661, Mr. Pepys writes:

"Sir W. Batten yesterday sent my wife half a dozen pairs of gloves, and a pair of silk stockings and garters, for her Valentines."

And on St. Valentine's day, 1667, we find the following entry:

"This morning comes little Will Mercer to be my wife's

Valentine; and brought her name writ upon blue paper in gold letters, done by himself, very pretty; and we are both well pleased with it. But I am also this year my wife's Valentine, and it will cost me five pounds."

The sending of verses to the person chosen, or assigned by lot, as a "Valentine," is also a very old custom. This pairing off of couples is sometimes said to be in imitation of the birds, who were thought to choose their mates on St. Valentine's day. In "The Parlement of Foules," Chaucer says:

"For this was on Seynt Valentyne's day, when every foul (fowl) cometh ther to choose his make (mate)."

And the same poet has many other references to this saint. Michael Drayton (1563-1631) wrote some charming verses to his Valentine, beginning as follows:

"Muses bid the morn awake,
Sad winter now declines,
Each bird doth choose a make,
This day's Saint Valentine's.
For that good Bishop's sake
Get up and let us see
What beauty it shall be
That Fortune us assigns."

On the occasion of the marriage of the Princess Elizabeth, daughter of James I, and ancestress of our present royal family, on St. Valentine's day, 1613, the poet Donne wrote a marriage hymn beginning:

"Hail, Bishop Valentine, whose day this is.
All the air is thy diocese,
And all the chirping choristers
And other birds are thy parishioners."

No connection has ever been traced between the Roman bishop and martyr, St. Valentine, and the popular ceremonies with which his day is observed.

The great function of the public schools is to establish character. One of the essential elements of character is a sympathetic attitude towards the rights, privileges, and feelings of others. When a child has learned to sympathize with the feelings of animals, he has made a long step towards the recognition of the rights of his fellow-beings and has made a substantial gain in his education. Any effort looking towards an increased appreciation of the birds and animals around us is a legitimate part of public school work.—*Supt. Stratton D. Brooks.*

The REVIEW has been exceedingly helpful to me in my work. The picture supplements meant much to my school. After careful study they were passported and hung on the walls.

Hamilton, N. Y.

MISS A. W. WARREN.

Geography Match.

A pleasant and profitable game which often helps out in a Friday afternoon programme or in a regular geography class, is this. Have the class choose two captains, as in a spelling match. The captains then take turns in choosing their companions. When all are ready, the teacher writes as many names of rivers, lakes, mountains, cities, etc., as she thinks best on the blackboard, these names suggesting the lessons studied during the week.

The captain of one side begins with the first word on the board, and tells *one* fact about it. If the word is the name of a river, he may tell its source, what direction it flows, into what body of water, or some interesting thing about it. The captain on the other side takes the second name and does the same with it. The next in order takes the third, and so on, until all the words have been gone over. When one fact has been told about each, the list is gone over again, and a different fact is told the second time. The object is to be able to tell as many different things about the various places, rivers, etc., as possible, without repeating any fact. If this should occur; that is, if any one should happen to mention a point that has already been spoken of, he must take his seat. Thus the game goes on until all have been compelled to resign their places, or all has been told that can be. In order to be good geography matchers, it is necessary that the pupils study their every day lessons thoroughly; and this they are very likely to do for the sake of the Friday afternoon geography match.

In place of having pupils take seats on making a mistake, which deprives them of any further benefit they may receive from the exercise, a mark may be placed after their name showing that they have failed.

A pleasant variation of the regular reading lesson is this. Ask each pupil to pick out a story in his reader that he likes particularly well. Each one has a different story, this is in order to break the monotony. Have the children prepare their stories carefully, that they will be able to tell them well. The pupils in studying should jot down on a small piece of paper the subject of each paragraph, to be used if necessary. While pupils are telling their stories, the teacher should take a seat with the rest of the audience and leave the pupil to depend entirely upon himself. The children are all anxious to tell a good story, and so do their best to express themselves clearly and well.—*Ex.*

About Numbers.

Our readers may be interested in the extract below, taken from Victoria, B. C., *Colonist*. Verifying some of the results may form an exercise in arithmetic as a relaxation from severer problems:

For a first illustration, let us add up any column of figures, say:

$$\begin{array}{r} 476 \\ 536 \\ 892 \\ \hline 1904 \end{array}$$

Now add 1, 9, 0 and 4 together and you get 14, and adding the 1 and 4 together and you get 5. Now add the figures in the lines in the column crosswise, thus, 4, 7 and 6, equal 17, and so on with the others. You get as the result 17, 14 and 19; and if you add these three sums together you will get 50, and 5 plus 0 is 5, which is the same as you got by adding the digits in the first total. There is doubtless some reason why this is always the case, no matter what figures are used or how many enter into the calculation. But what is it?

For a second illustration take the following: Take any number, the digits of which added make 19. Thus 289, the digits which added make 19, and 1 and 9 make 10. Now subtract 289 from 1,000 and you have 711, and add these digits together and they make 9. And you will get 9 as your answer no matter what number you start with, provided its digits add up to 10, and the amount from which you subtract it is either 100 or some multiple thereof by 10, that is to say 1,000, or 10,000, and so on. There must be some reason why this is so, but it is not very apparent.

Take another series of figures, the digits of which, when added, will make 6, say 87. Thus 8 and 7 make 15, and 1 and 5 make 6. Now divide 87 by 6 and you have three for a remainder. Turn the digits around and you have 78, which divided by 6 leaves no remainder. Thus we reach the rule that any number, whose digits when added as above give 6 as the result, is divisible by 6 without a remainder if the last digit is an even number, and with a remainder of 3 if the last digit is an odd number. This rule, as well as that immediately preceding it, is of some use in making mental calculations.

Take a number divisible by 3, without a remainder, say 8754. This number is divisible by 3 without a remainder no matter in what order you place the digits. Thus 7845, 4785, and any other combination of these figures is divisible by 3 without a remainder. Now take 8754, and instead of 8 write any numbers which, when added, are equal to 8, and so with the other digits. Thus for 8 put down 521, for 7, 52, for 5, 14, and for 4, 31. Placing these in a row, you will have 521521431, which is divisible by 3 without a remainder just as the original number 8754 is. The variations of this exercise are very many, and it seems as though the rule deductible from them may be of value.

Perhaps you know that any number made up of three repetitions of the same number or series of numbers is divisible by 3 without a remainder. Thus 777, or 555, or 262626, or 131313 are all divisible by 3 without a remainder.

This, if not generally known, ought to be, for it is a little bit of very useful knowledge. In fact the last three rules come in quite handily in making hurried calculations.

A good deal of amusement can be extracted from all the above arithmetical curiosities, if one only takes the trouble to study out the results that can be obtained by becoming familiar with them. They enable seemingly impossible results to be obtained from the statement of some single number. Working out some of the calculations possible by their use is very excellent mental exercise. There are very many other curious things about numbers, and the more one investigates them, the more evident it seems that there is an undiscovered side to the science of arithmetic.

Questions on Any Pine in Your Locality.

What is the general shape of the tree, and where does it grow?

What is the shape of the cone?

What is the character of its bark?

How long are the needles, and how do they compare in length and thickness with any other species of pine in your locality?

How many needles grow together in a bundle?

Is this bundle enclosed in a little sheath at the base? (In the white pine the sheath drops off very soon.)

Are these bundles grouped in distinct tassels, if so, how many constitute a tassel?

What shade of green is the general color of the foliage?

Cut a pine needle in two and look at the end with a lens, and note its shape. The white pine differs decidedly from the others in this particular.

How can you tell this year's from last year's and from next year's cones?

How old is the cone when it opens and scatters its seeds?

How many seeds are there under a single cone scale?

How many kinds of flowers does the pine tree have and where are they borne?

How is the pollen carried?

What is the most important commercially of our pine trees?

What is the pine wood used for?

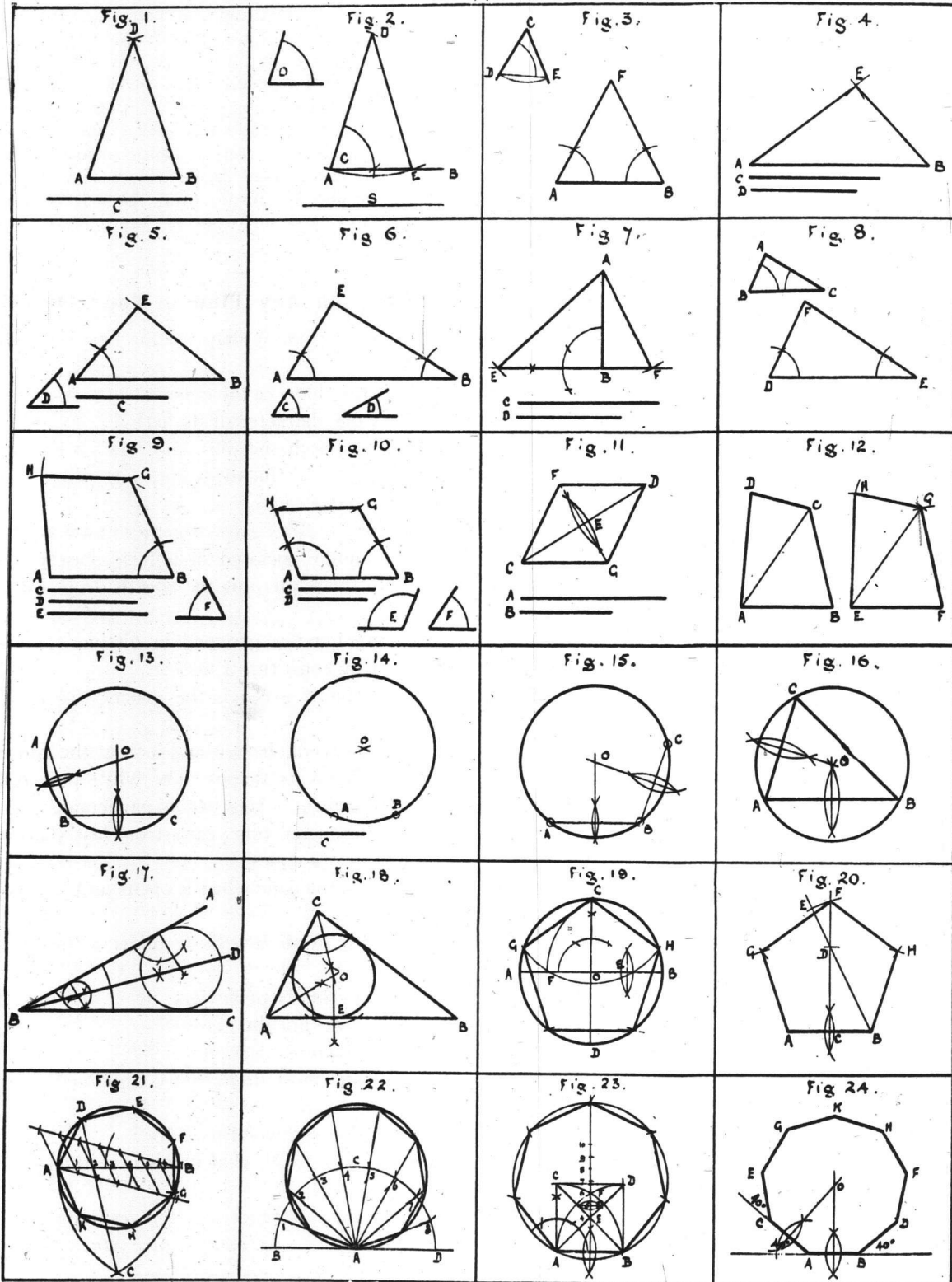
What is resin? Of what use is it to the tree? To the cone?

What is the difference between resin and rosin?

—Home Nature Study Course.

It is not enough to have earned our livelihood * * * the earning itself should have been serviceable to mankind.—R. L. Stevenson.

GEOMETRICAL DRAWING - GR. VII.



Geometrical Drawing — III.

PRINCIPAL F. G. MATTHEWS, TRURO, N. S.

The following exercises have been prepared for grade VII. They will be found to be easily graded, repeatedly bringing in principles already learned. Space has forbidden the drawing of more scales, but these should be continued and increasing in difficulty. In the early attempts with the problems in triangles and quadrilaterals, it is a good plan to use inches with decimals to one place. For this purpose, if the ruler does not shew tenths of an inch, the children can easily make a paper scale, dividing the inch into ten parts as in the problems 6 and 7 for grade VI. The protractor should also be constantly used in the construction of angles, as these are now required of all sizes.

It will be noticed that exercises have not been placed after every problem. These have been omitted to save space, and because they are so easy to formulate.

Teachers requiring more exercises can find numerous examples in one of the books prescribed for Nova Scotia, viz, "Mechanical Drawing," by S. A. Morton. (T. C. Allen & Co., Halifax.)

The remainder of the regular polygons have been included in the work for this grade, because they are favorites with children, and yet require such accuracy that they induce careful work.

FIG. 1. *To construct an isosceles triangle, the base and sides given.* Let AB be the base and C the length of sides. From A and B as centres, and radius equal to C, describe arcs cutting at D. Join AD and BD.

For an exercise this may be given to scale, thus, base 1.3 inches and sides 2.6 inches; and the children then required to determine the angles with protractors.

FIG. 2. *The same as Fig. 1, the sides and base angles given.* Let S be the length of sides and O the base angles. Draw any base line AB. At A make the angle BAD equal to the angle O. Cut off AD equal to S. With D as centre and DA as radius, draw arc AE. Join DE.

For exercise give the sides in inches or centimetres and the angle in degrees.

FIG. 3. *The same as Fig. 1, the base and vertical angle given.* Let AB be the base and DCE the vertical angle. With C as centre and any convenient radius, draw arc DE. Join DE. At A and B make the angles BAF and ABF equal to the angle CDE. Produce the sides till they meet at F.

FIG. 4. *To construct a triangle, having given*

the three sides. Let AB, C and D be the three sides. With A as centre and radius equal to C, draw arc at E. With B as centre and radius equal to D, draw another arc cutting the first. Join AE and BE.

This and the following exercises in triangles and quadrilaterals may be given to various scales. Example:—A man has a triangular shaped piece of land. The boundaries are respectively 215, 180 and 135 yards. Draw a plan of the plot to a scale of 100 yards to the inch.

FIG. 5. *The same as Fig. 4, two sides and one angle given.* Let AB and C be the sides and D the given angle. At A make the angle BAE equal to D. Cut off AE equal to C. Join EB.

FIG. 6. *The same as Fig. 4, the base and two base angles given.* Let AB be the base, and C and D the given angles. At A construct angle BAE equal to C, and at B make angle ABE equal to D, producing the sides to meet at E.

FIG. 7. *The same as Fig. 4, the perpendicular height and two sides given.* Let AB be the perpendicular height, and C and D the sides. Through B draw EF at right angles to AB. From A as centre, with radius equal to C draw arc cutting base at E, and with radius equal to D another arc cutting at F. Join AE and AF.

FIG. 8. *The same as Fig. 4, similar to a given triangle.* Let ABC be the given triangle. On a base of any suitable length copy the two base angles just as in Fig. 6.

FIG. 9. *To construct a quadrilateral, four sides and one angle given.* Let AB, C, D and E be the given sides and F the given angle. At B copy the angle F. Cut off BG equal to C. From G as centre and radius equal to D, draw arc at H. From A as centre and radius equal to E, draw another arc cutting at H. Join AH, HG.

FIG. 10. *The same as Fig. 9, three sides and two included angles given.* At A and B copy the required angles cutting off the sides equal to those given. Join HG.

FIG. 11. *To construct a rhombus, having given the diagonals.* Let A and B be the diagonals. Draw CD equal to A. Bisect it at E, and draw FG, making FE and EG each equal to a half of B. Join CF, FD, DG and GC.

FIG. 12. *To make a trapezium or any rectilinear figure equal to a given one.* By drawing diagonals cut the figure into triangles, and copy each triangle as in Fig. 4.

FIG. 13. *To find the centre of a given circle.* Draw any two chords AB, BC (these chords must

not be parallel to one another). Bisect each chord and produce the bisecting lines till they meet in O, which is the centre of the circle.

This may be worked by drawing one chord, bisecting and producing the bisecting line to form a diameter, and again bisecting the diameter.

FIG. 14. *To describe a circle of given radius which shall pass through any two given points.* Let A and B be the points and C the radius. From A and B as centres and radius equal to C, draw arcs cutting at O. O is the centre of the required circle.

FIG. 15. *To describe a circle which shall pass through any three given points.* Let A, B and C be the given points. Join AB and BC. Treat these as chords and bisect as in Fig. 13. From O as centre and radius OA describe the required circle.

FIG. 16. *To describe a circle about a given triangle.* Bisect any two of the sides and complete as in Fig. 15.

FIG. 17. *To find the locus of the centres of all circles which shall touch two given inclined lines.* Let AB and BC be the given lines. Bisect the angle ABC by line BD. All circles touching the two lines have their centres on BD.

FIG. 18. *To inscribe a circle in a given triangle.* Bisect any two angles and produce the lines till they meet in O. Drop perpendicular OE from O to line AB. With O as centre and radius OE describe the circle.

FIG. 19. *To inscribe a regular pentagon in a circle.* Draw two diameters AB and CD at right angles. Bisect OB in E. With E as centre and EC as radius, draw arc CF. With C as centre and radius CF, draw arc GFH. Then CG and CH are two sides of the pentagon. Cut off the others on the circumference.

Exercise. Join alternate angles to make a five pointed star.

FIG. 20. *To construct a regular pentagon on a given base.* Bisect the base AB and erect perpendicular. Cut off CD equal to the base AB. Join BD and produce to E, making DE equal to half the base. With B as centre, and radius BE, draw arc cutting the perpendicular in F. From A, B and F as centres, and radius AB, draw arcs cutting at G and H. Join AG, GF, FH, and HB.

FIG. 21. *To inscribe any regular polygon in a given circle.* Draw the diameter AB. Divide it into as many parts as the figure is to have sides, in this case seven. From A and B as centres and AB radius draw arcs cutting at C. Draw a line from C through the second division cutting the circumfer-

ence on the farther side at D. AD is one side of the polygon. Step off the rest.

This and the three remaining exercises require extreme accuracy to get correct results.

FIG. 22. *The same as Fig. 21.* Another method. Draw any straight line touching the circle at A. From A as centre, draw any semicircle. By trial divide this semi-circle into as many parts as the figure is to have sides. Join A₁, A₂, etc., producing the lines to cut the original circle. Join the points where they cut the circle to form the polygon.

FIG. 23. *To construct any regular polygon on a given base.* Let AB be the given base. Bisect it and erect perpendicular of indefinite length. On AB erect a square and draw diagonals cutting at E. Also on AB erect an equilateral triangle with apex at F. Now E is the centre of a figure of four sides equal to AB, and F is the centre of a figure of six sides all equal to AB. Bisect EF in G. This will be the centre of a figure of five sides all equal to AB. Take the distance EG, and step off from F, giving the points 7, 8, 9, 10, etc. These will be the centres of figures of the corresponding number of sides. For instance from 7 as centre and radius 7A, describe circle. With compasses step off the sides all equal to AB on the circumference to form a regular heptagon.

FIG. 24. *The same as Fig. 23.* Protractor method. Divide 360 by the required number of sides to find the exterior angle. By means of the protractor construct angles at A and B as shewn. Cut off AC and BD equal to AB. The figure may be completed by the protractor, but a better plan is to bisect two of these sides, and produce the lines till they meet in O. From O as centre and radius OA describe the circle. Step off distances equal to AB on the circumference.

Two Little Fellows.

I know a little fellow whose face is fair to see;
But still there's nothing pleasant about that face for me;
For he is rude and selfish, if he can't have his way,
And always making trouble, I've heard his mother say.

I know a little fellow whose face is plain to see,
But that we never think of, so kind and brave is he;
He carries sunshine with him, and everybody's glad
To hear the cheery whistle of that dear little lad.

You see it's not the features that others judge us by,
But what we do, I tell you, and that you can't deny;
The plainest face has beauty, if its owner's kind and true,
And that's the kind of beauty, my boy and girl, for you.

—Our Little People.

Comenius, Pestalozzi and Froebel.

MRS. C. M. CONDON, TRURO, N. S.

Three bright particular stars shed their light over the educational world from the time when Comenius, justly called, "The Father of Modern Education," began to teach in the year 1614, until the death of Froebel in 1852. John Amos Comenius was born at Nivnitz, in Moravia, in 1592, and died at Naarden, near Amsterdam 1671. Although fully prepared, his youth prevented him assuming the pastoral office until 1618. In the interim he was rector of the school at Preran, from which place he proceeded to the parish of Fulneck, where he remained six years.

From Fulneck, in common with all the evangelical pastors in the Empire, he was driven out in 1624, loss of wife, child, less books and all his possessions, by the cruel edict of Ferdinand II. He took refuge at Lissa, in Poland, where in 1628 he was invited to take office in the faculty of the Academy. During all these years he responded to invitations from Princes and Nobles to organize and re-organize, on his own sound principles, their system of education. His labors were so abundant, and bestowed in so many different quarters, that it is almost impossible to follow him minutely. Meanwhile his fame as a pedagogist spread abroad.

His *Janua Linguarum (The Gate of Languages)* which appeared in 1631, was at once translated into twelve European languages, and several Asiatic. Among other copies in the British Museum, is a 4th edition, 1640, in French, Italian, Latin and German, arranged in parallel columns. In 1642 an edition was also published in Greek and Latin. This important book greatly improved the teaching of Latin, by using the mother-tongue, as the medium of instruction.

In 1641 he was invited by the English Parliament to come to England, and to settle a national system of education. He was received with distinguished honor by the Universities of Oxford and Cambridge. Later on, they gave a very tangible proof of their esteem, by sending him the sum of nearly £6000 stg. to aid him in his educational enterprises. One cannot but speculate, in view of the present chaotic state of English educational affairs, on what would have been the result of Comenius' labors, if the Civil War had not frustrated the design. Oxenstiern, the famous Chancellor of Gustavus Adolphus, more fortunate than England, secured his services in 1642, and

Comenius drew up the scheme of a system of education for Sweden.

In 1648 he went to Hungary by invitation of one of the Princes to organize schools. In 1652 the Poles burned Lissa, to which he had returned, when losing for the second time everything he possessed, he narrowly escaped with his life. After many perilous wanderings, he reached Amsterdam, where he was accorded the generous welcome due to his genius, learning and piety.

In 1648 he had been made a bishop of the Bohemian Church, which, however, by the destruction of Lissa, was brought to an end as an organization; so that he was the 20th and last bishop of the Bohemian Brothers, the Episcopate of which had lasted 204 years. In Amsterdam he continued his life-work, and this truly great man, who bore his sorrows with fortitude and pious resignation, turned them to account by his writings. One, *The Labyrinth of the World and the Palace of the Heart*, is said to be equal to the *Pilgrim's Progress*; but this, and most of his religious writings, are overshadowed by his renown as an educationist and his *Orbis Pictus*, which lead the child by pictures and descriptions, to a knowledge of "the principal things in the world and the principal occupations of man." This ideal demands early training of the infant by the mother to prepare for the school; observation, perception, reflection, and expression of knowledge, as fast as gained, fluent and accurate speech, and in little works of skill, wisdom, knowledge, virtue and piety are the results to be aimed at. He complains that instruction is too much like "a load of wood well piled; whereas, it should be a growing plant." "Give knowledge as a seed to be developed by the mind of the child himself, not as a grown-up plant."

In his plea for nature-study, he says; "Everyone sits, as it were, in the amphitheatre of God's wisdom, the poorest and meanest may see something thereof, and should relate it." He deprecates severity in discipline, then rife, but would by firmness, gentleness and reason, "treat children as reasonable beings." Body, soul and spirit are to be trained for life here, and life hereafter, and no amount of learning can compensate the lack of virtue and piety.

He is separated from us by 250 years, but the more closely you study his doctrines and life-work, the more clearly you perceive how noble and true is his ideal of education, the blessings of which he would offer to all, without regard to rank or sex.

Pestalozzi was born in 1746, seventy-five years after the death of Comenius. He died 1827, sad, lonely and depressed by the sense of failure; yet he had sown seeds that have germinated and borne rich fruit all over the world. As long as men value education, his name will be held in honor.

Early in life he lost his father, and his loving mother. The faithful servant who had promised never to leave him, brought him up so tenderly that they made him weak in body, and gave him no freedom for self-activity. It is always well for a human being to make his mistakes early enough to retrieve them. Childish errors are seldom fatal; and are necessary for self-revelation. This advantage, Pestalozzi lacked to the detriment of his adult life.

His ignorance of the world, his want of sound training and instruction, and the late period of life at which he became an educator, fill us with wonder that he should have accomplished so much.

He was the connecting link between Comenius and Froebel, in his enthusiasm of humanity, and his self-sacrificing devotion to the cause of education. The children, left orphans by the Napoleonic wars, hungry, naked and forlorn, filled him with compassion. He gathered a few of them into his own house. "I was father, nurse, teacher; I lived with them, was their constant companion." Think what this association with filthy, half-savage creatures meant to the man brought up so daintily. An old convent near Stanz, was given up to him by the Cantonal Government to house the increasing numbers. His aim was to "teach the harassed poor to live like men."

His teaching of arithmetic, and object lessons attracted the attention of the civilized world, to a study of his methods, and in the fine Borough Road Schools of London, his methods were illustrated and carried out in a logical sequence, of which Pestalozzi himself was incapable. His discipline in which love ruled, raised the whole moral tone of school-life. But unlike Comenius and Froebel he could not explain, and set forth in due order, the principles on which his practice rested. "When asked to do so he would say; watch my teaching, and you will see." The noblest tribute to Pestalozzi has been paid by Froebel, who, with his own two pupils, spent two years at Yverdon, in Switzerland, studying and teaching in his institution. This inability of Pestalozzi to discern the operations of his own mind was a constant trial to Froebel, whose clear and logical acumen enabled him to disentangle, arrange and re-arrange a concept and view

it in its action and re-action and interaction with other concepts. But such power is the possession of few. The clue to Pestalozzi's success, lies in his oceanic heart of benevolence."

Froebel, was born 1782, and died 1852. Like Comenius he was a thoroughly educated man. He had had already a most chequered career, and a wide experience of men and things, when in 1805, he took the situation in the model school at Frankfurt on the Main, offered by Dr. Gruner, the principal, himself a disciple of Pestalozzi.

When Froebel stood before his large class of boys, he says; "I found my vocation; the fish was in its native element, the bird was in the air." He spent his vacation of a fortnight with Pestalozzi, and in 1808, passed two years at Yverton. In 1812 he enlisted in Lützow's famous Black Corps, for he felt that one who was not prepared to defend his country, was unworthy to instruct and train the young. There in camp, he became acquainted with his future faithful co-workers, Middendorff and Langethal, two divinity students, who gave up their profession, that they might help him in his ideal of raising man, through and by education, to a true conception of their relations to nature, humanity, and God. Many other faithful laborers have thrown light upon the problem of education, but, by general consent, these three men stand pre-eminent in the grandeur of their conception of man; in the soundness of their methods for his development; and in the sagacity with which they have brought down visions, floating in the air, and made them realities by means, skilfully adapted to the nature and needs of the infant, the child, the youth and the man.

Winter Nests.

O piteous nests of winter-time,
 Disclosed to every careless eye,
 In hedges dark with dripping rime,
 Where is your Summer secrecy,
 Your green pavilion of the prime?
 Poor little nests, that hang forlorn
 In bushes almost reft of leaves,
 And naked thickets of sharp thorn,—
 Robbed of your shelter by those thieves
 The frosts, and made a mark for scorn!
 Nests that so cunningly were thatched
 With fibres made to interlace,—
 In which the brittle brood were hatched,
 In your once cherished hiding-place,
 By Winter's harpies rudely snatched!

—*The Spectator.*

The Music of Poetry.

By D. F. FRENCH,

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Music is the expression of emotion without words and may, therefore, arouse feelings of sadness, joy, peace, etc., without involving the conception of any definite ideas. Poetry is the expression of emotion in words, and an attempt is made to produce, as nearly as possible within the limitations of ordinary speech, the effects of music. This attempt is the basis of all forms of metre.

Almost any one can recognize the difference between the slow, solemn tones of the Dead March and the quick, cheerful movement of an Irish Jig: the dreamy music of the waltz is readily distinguished from the "ragtime" of the negro melody. The difference in effect is caused by a difference in the length of the notes used and the number grouped in each measure, and a consequent variation of the accent. The fewer and longer the notes in a bar the more solemn and stately the music, while several short notes in succession produce a lively effect.

We find precisely the same thing in poetry: long vowels and short measures are in keeping with verse of dignity and deep thought; longer measures with shorter vowel sounds produce a form of metre suitable to lighter themes. We need only to read aloud the lines:

"Break, break, break,
On thy cold, gray stones, O Sea;"

and:

"So this is your cradle, why, surely, my Jenny,
Such cosy dimensions go clearly to show," etc.

—to tell from the movement of the voice alone that the theme of the former is full of deep, serious emotion, and that the latter is an extract from something light and humorous.

Examine the metrical form in these quotations: the first line of the first extract has but one syllable to a measure; in the second line two syllables is the rule; the vowels are mostly long. In the second quotation there are three syllables to a measure and the vowels sounds are mostly short.

You may refer to any poetical selections from good authors and you will find that our rule invariably holds true. Wordsworth, in his disregard for form, gives us his sweetly serious "Reverie of Poor Susan" in lively dance time and thus spoils the whole effect. How can one feel serious in reading:

"At the corner of Wood Street, when daylight appears,
Hangs a thrush that sings loud; it has sung for three
years."

The imitative harmony of poetry is usually the musical effect resulting from the variety in arrangement of long and short vowel sounds, changes of accent, and difference in the number of syllables used in the measure.

Every lover of poetry can collect abundant examples of musical effect in poems. We will, however, cite here a few quotations which will further illustrate the points mentioned.

In Tennyson's Lullaby we find an exact imitation of the rocking of the cradle.

Sweet and low, sweet and low,
Wind of the western sea.

Observe carefully how the monosyllabic foot and what we might call the curve of sound, produce a rythmical movement which, aside from any idea conveyed by the words, impresses a mental picture of the rocking cradle by imitating its sound.

In Longfellow's "Old Clock on the Stairs" the ticking of the pendulum is imitated by a similar device:

"Forever, Never,
Never, Forever."

Tennyson in the "Northern Farmer" makes the old man speak of the canter of his horse thus:

"Proputty, proputty, proputty, that's what
I hear 'em say."

Can't you hear the hoof-beats on the hard road?
The use of long vowels to give a slow movement to the verse corresponding to the sense, is shown in:

"The long day wanes; the slow moon climbs;
The deep moans round with many voices."

Compare with the above the movement of:

"Haste thee, nymph, and bring with thee
Jest, and youthful jollity,
Quips and cranks and wanton wiles,
Nods, and becks, and wreathed smiles."

In Tennyson's "Bugle Song" the arrangement of accent changes in the last two lines of each stanza. First we have:

"The splendor falls on castle walls."

Then in closing:

"Blow, bugle, blow, set the wind echoes flying,
Blow, bugle, answer, echoes dying, dying, dying."

In the refrain the gradual falling of the stress of voice in the pronunciation of the words in each measure imitates the dying away of the echoes. With the stress falling on the word at the end of the measure this effect could not have been produced.

While in much poetry the element of music is greatly subordinated to the meaning, in none—except such as Walt Whitman's—is it entirely absent. Tennyson and Swinburne are masters of the art of infusing subtle music into verse, while Dryden and Pope give us a minimum of musical effect. The poetry of the latter appeals more to the intellect, yet that of the former has a deeper effect since it touches the chords of human sympathy and through its music wakes to life our tenderest emotions.

A Canadian poet—Bliss Carman—says, "The measure of verse has an influence on us beyond our reckoning. The simplest statement of truth, thrown into regular verse, comes to us with new force."

Lines in Season.

Roll your ball of snow, children,
Roll your ball of snow.
The more you roll your snow ball up
The bigger it will grow.
Roll a kind thought around, children,
Roll it all around,
Until it gathers all kind thoughts
That loving hearts have found.

—Midland Schools.

Let us be content to work,
To do the thing we can, and not presume
To fret because it's little. —Browning.

The talent of success is nothing more than doing what you can do well, and doing well whatever you do.—Long-fellow.

The optimist sees the doughnut and the pessimist sees the hole.—The Lyceumite.

Count that day really worse than lost
You might have made divine,
Through which you scattered lots of frost,
And ne'er a speck of shine.

—Nixon Waterman.

I am little February,
Shortest month of all the year.
Short my days are, too, and few,
Cold, maybe, but very merry.
Not so many, it is true,
As my sisters bring to you,
But such good days and so dear.
I'm the month of February,
Short and cold, but full of cheer.

May every soul that touches thine,
Be it the slightest contact, get therefrom some good,
Some little grace, one kindly thought,
One inspiration yet unfelt, one bit of courage
For the darkening sky, one gleam of faith
To brave the thickening ills of life,
One glimpse of brighter sky beyond the gathering mist
To make this life worth while,
And heaven a surer heritage. —The Outlook.

I Love the Winter.

First Child—

I love the winter,
Now, don't you?
There is so much
A child can do.

Turns toward the other three children.

Second—

I love to coast, and
Skate, and slide,
Or from some "pung man"
Beg a ride.

Imitates the motions of skating and sliding.

Third—

I love to tunnel
Out the snow,
I love to see a
Snow man grow.

Imitates using a shovel.

Fourth—

But best of all is
Snow to take
And press until fine
Balls you make.

Imitates making a snowball.

All—

And then to throw them
One by one;
In snowball game is
Jolly fun!

Imitate throwing snowballs at one another.

—Primary Education.

A Brace of Valentines.

A Scotchman whose name was Isbister
Had a maiden giraffe he called "Sister;"
When she said "Oh, be mine,
Be my sweet Valentine!"
He just shinned up her long neck and kissed her.

A hip-po-po-ta-mus named Amos
Was loved by a chorus girl famous;
All the other girls sighed
As they looked on, and cried,
"Please tame us a hip-po-po-ta-mus."

—The Delineator for February.

[This last innocent jingle reminds one of the wag who stopped his friends in the street on one of the recent cold days, and inquired, with a look of anxious concern:

"Have you seen Amos to-day?"

"Amos who?"

"A mosquito!" and then he vanished.]

"On a dark cold night, not long ago,
Came a little child all clad in snow;
Small was he as he hurried along,
Singing to himself this funny little song:
'Ho! ho! ho! does every one know
I am little February from the land of snow?'"

Natural History for Little Folks.

FROM "STORIES FROM NATURAL HISTORY."

The Caterpillar and the Fly.

The gardener had planted a cabbage, had dug and manured the ground, watered the young plant, and cleared away the weeds. And the cabbage grew lustily, bearing young and juicy leaves, and growing bigger and stronger, whilst the gardener watched it and was glad.

But one night, when all the world was asleep, a greedy caterpillar came that way and crept up the stem of the plant. What did it matter? There was no one to see. All night long she never ceased eating, first the young and tender leaves, and then the others, and when daylight came she hid beneath the foliage. So the caterpillar grew fat and big on the cabbage which did not belong to her, and which she had neither planted nor cared for. What did it matter if she was living on other people's property? There was no one to see.

But with the bright sunshine came the little ichneumon, or caterpillar-eater, a tiny fly, that is so small that she can hardly be seen, but who, with busy wings and quick little legs, skips from flower to flower, and from leaf to leaf. And so she came to the poor half-stripped cabbage stalk, and to the hidden caterpillar. With her sharp sting she bored a tiny hole into the body of the sleeping gormandiser, and into this she laid an egg, so minute that, most surely, there was no one to see it, so what did it matter? Then she flew away.

The greedy caterpillar paid no attention to the sting of the fly, and went on eating, till the cabbage stalk stood quite bare. Then, round and fat, she hurried to the wall of the house and climbed up to the roof, where she turned into a chrysalis and remained hanging. And now do you suppose that a beautiful winged butterfly came out of the chrysalis to fly away over the cabbage bed, where the gardener was standing looking sadly at the naked cabbage stalk? No, indeed, no caterpillar ever came out of that chrysalis. For though no one saw the mischief done by the caterpillar, no one, likewise, saw her punishment. The cocoon opened, and, instead of a butterfly, came out a young ichneumon fly armed with a sharp sting, to fly away and quietly work out the punishment of other greedy caterpillars, who think it does not matter what mischief they do so long as no one sees them.

The Work of Ants.

In a pine forest, on a dry, sandy hillock, there was an ant heap, nearly as high as a child, with swarms of active little ants hurrying up from all sides and creeping into it. Why do you suppose the ants had built this high heap, and what were they so busy about? You may think it was a palace of pleasure, with dining halls and play rooms, and fine fun going on all day, for they were nearly all dragging into the heap something to feast upon, one tugging at a dead caterpillar, whilst another had a dried-up fly, or some other dainty.

Now, let me tell you, the ant heap is no holiday house, for the ants only built it for their little sisters. It is a big nursery, in which the young ants are nursed and brought up by the old ants, their sisters. They bring together pine needles, blades of grass, and wood splinters, lay them carefully on each other, stick them together with mud and grains of sand, and so make halls and passages, rooms, and closets. They cover the outside of this wonderful structure with leaves and pine needles, making a close, slanting roof, from which the rain runs off, leaving the inside warm and dry.

The ant mother lays tiny eggs, no bigger than fine grains of sand, and from each egg there will come a young ant. The old ants carry the delicate eggs deep down into the earth at night, into the lowest halls of the building. There they remain nice and warm throughout the night, and when the sun shines brightly on the heap by day, they drag the eggs up again into the topmost room, in which they are hatched by the sun's rays. But the ant eggs must not only be kept warm like the bird's eggs, to bring the young inside to life, they must also be tended. The old ants lick them daily, covering them with a sweet juice which they bring in, for without this the eggs would dry up and perish.

Out of the eggs slip little, white, helpless grubs, that can neither walk nor seek their own food. The old ants carry the little creatures up and down in the heap, in just the same manner they did the eggs, fetching them food from the wood and putting it into their mouths. The quite young grubs only get sweet honey, but as soon as they are big they get stronger food. The grubs are also carefully licked and cleaned every day, so that no speck of dust remains on them, otherwise they would sicken and die.

When they have grown up they weave a fine web

round themselves and sleep in it as in a little bed. Even then they are carried up and down daily by their elder sisters, who always find the warmest places to lay them in. Should someone disturb the ant-heap so that a chrysalis lies uncovered, the ants never think of themselves, but in all haste seize it and carry it into safety, whilst others defend the little ones or try to catch the disturber of their peace and bite them viciously.

Inside the cocoon the grub becomes an ant. The elder sisters listen carefully every day to hear if the little one is moving and ready to emerge, for she cannot get out of her web by herself. When they hear a knocking inside they cut the web open with their pincers and help the young sister to step out. Now look! This young ant has four delicate wings. In early autumn, when the weather is warm, thousands upon thousands of such winged ants come out of the earth. They buzz up into the air, dance about a while, and then sail far away like a cloud to make new ant-heaps in other places.

The industrious elder sisters can only sit and watch, but they have never expected thanks or reward from their young charges. They found their whole happiness in the care of their young sisters, and when the ant mother lays her eggs again next summer, they will take the same care of the new brood.

The Story of a Wax Candle.

When in the cool forest the trees are flowering, thick yellow clusters of pollen-covered blossoms hang from the pine and fir trees, and on the ground below many different kinds of flowers open their coloured bells. The stamens of blossoms burst open in the warm sunshine and the delicate pollen peeps out of them like fine, yellow powder.

The ever busy bees are buzzing through the forest. They have to find a new home for a young queen who has arisen at the head of a swarm of bees, and her faithful followers are hunting for building materials. They come to the blossoming trees and flowers and crawl into them. To reach the honey at the bottom of the tube they must pass the pollen-covered stamens, and this pollen adheres to the brown fur of their bodies, so that they are covered with powder when they come out.

The bee will then pause awhile on the glossy leaf of a tree to brush herself carefully with the stiff bristles of her feet, roll up the gathered pollen into neat little balls, and fasten them to her legs, where, for this purpose, she has little hollows, called pollen

baskets. Then, arrayed in baggy pantaloons, she flies away home.

The pollen bids farewell to the forest trees and flowers, and becomes food for the bees. In the stomach of the bee it changes into the finest wax, which exudes in delicate flakes from beneath the body of the worker bee. The folds between the hard scales of the body are the bee's pockets, for storing building materials. With their feet they pull off the flakes of wax, knead them together with their jaws, mix them with saliva, and build with this mixture the loveliest six-angled cells. In these cells they tend the young bees, their foster children, feeding them and tending them until their charges finally throw off their cocoons.

But in other wax cells the bees store a rich provision of sweet honey. In the winter they crowd close together to keep each other warm, and sleep through the cold winter, so that when spring comes with new blossoms and new honey the cells are still mostly filled. The bee-keeper takes the full honey comb from the hive, and we give the honey to children to eat with bread, but what becomes of the wax? Why, that comes into the candle.

When Christmas comes and the children are asleep, father and mother fasten a number of candles on a fir tree which the wood-cutter has cut down in the forest. And so at Christmas time these parted friends come together again after a long time of separation. The pollen, after many wonderful adventures, has come, in the shape of wax candles, on to the evergreen branches of a fir tree, and who knows if they did not spring from the self-same forest? The bright flames on the tree are then its blossoms, and have more to do with it than you would think at first sight, for have they not come from the same home?

Query for Review Subscribers.

Mrs. A., Mrs. B. and Mrs. C. and their daughters bought laces. Each paid as many cents per yard as she bought yards, and each lady paid 63 cents more than her own daughter. Mrs. A. bought 23 yards more than Jane, and Mrs. B. 11 yards more than Eliza. The third girl was named Ann. How many yards did each buy, and whose daughter was Jane, Eliza and Ann respectively?

Answer next month.—C. E. L.

I have read the REVIEW with profit from its first number; and though not engaged in teaching for many years, I still appreciate its increasing usefulness.

C. E. LUND.

Sackville, N. B.

Rhymes for Little Folks.**The Pebble's Lesson.**

How smooth the sea-beach pebbles are!
 But do you know,
 The ocean worked a thousand years
 To make them so?
 And once I saw a little girl
 Sit down and cry
 Because she couldn't cure a fault
 With one small try.

—Selected.

Two New Scholars.

They'd never been to school before,
 They'd never been near a schoolhouse door,
 Those bashful little boys.
 Mamma had taught them all they knew—
 She was a lovely teacher, too—
 But now—just hear the noise!
 Though to each other close they kept,
 One bent his golden head and wept,
 And the other, he wept, too.
 Around each neck a dimpled arm,
 As though to keep them safe from harm,
 A sweet child gently threw.

"The corner seat's enough for three;
 Come over there and sit with me,"
 She sweetly said; and—my!
 They like the school so much to-day,
 I know if they were taken away
 They'd both tune up and cry.

—Golden Days.

Rainy days and sunny days—
 What difference makes the weather,
 When little hearts are full of love
 And all are glad together?

—Selected.

The Song of the Wind.

I've a great deal to do, a great deal to do;
 Don't speak to me, children, I pray;
 These little boys' hats must be blown off their heads,
 And these little girls' bonnets away.
 There are bushels of apples to gather to-day,
 And, O! there's no end to the nuts;
 Over many long roads I must traverse away,
 And many by-lanes and short-cuts.

—Selected.

The Fox and the Squirrel.

Two squirrels on an oak-tree sat,
 Engaging in a social chat,
 When one—the younger of the twain—
 Of his accomplishments quite vain,
 Began to boast of what he'd done,
 How all his mates he could outrun;
 And if but half he said was true,
 He could outjump a kangaroo.

Now, as it chanced, the jagged rocks
 Beneath the tree concealed a fox,
 Who, overhearing what was said
 Among the oak-leaves overhead,
 Bethought him of a sly design,
 Whereby he might on squirrel dine;
 So up he sat and clapped his paws,
 Loud shouting, with a mock applause:

"Bravo! Bravo! my agile friend,
 Your wondrous skill I must commend,
 But really, I should like to see
 You jump from out this tall oak-tree
 To yonder ash ten feet away."

("Twas twenty, I am bound to say),
 "The feat will please my children well,
 When I their bed-time story tell."

"Nay," said the elder to young Frisky,
 "Don't undertake a jump so risky,"

To which the younger one replied,
 Puffed up with flattery and pride:

"Though you may lack ability
 I'll show you my agility."

Then wildly leaped with aim, so blind,
 That—Mr. Fox on squirrel dined.

A Winter Piece.

But Winter has yet brighter scenes,—he boasts
 Splendors beyond what gorgeous Summer knows;
 Or Autumn with his many fruits, and woods
 All flushed with many hues. Come when the rains
 Have glazed the snow, and clothed the trees with ice;
 While the slant sun of February pours
 Into the bowers a flood of light. Approach!
 The incrustated surface shall upbear thy steps,
 And the broad arching portals of the grove
 Welcome thy entering. Look! the mossy trunks
 Are cased in the pure crystal, each light spray;
 Nodding and tinkling in the breath of heaven,
 Is studded with its trembling water-drops
 That stream with rainbow radiance as they move,
 But round the parent stem the long low boughs
 Bend, in a glittering ring, and arbors hide
 The glassy floor. Oh! you might deem the spot
 The spacious cavern of some virgin mine
 Deep in the womb of earth—where the gems grow,
 And diamonds put forth radiant rods and bud
 With amethyst and topaz—and the place
 Lit up, most royally, with pure beam
 That dwells in them.

I have been a subscriber to the REVIEW from its first issue. It has taught me much; it has encouraged me when I have been discouraged, and made my work a pleasure when there was danger of thinking it a toil. I venture to wish the REVIEW and its editor many happy years in working for the benefit of others.

Very sincerely yours,

MARGARET S. COX.

Cornhill, N. B.

Aunt Mary's Four Guests.

"The table is all set, Aunt Mary."

"All right," Aunt Mary answered, "we will have dinner as soon as the outdoor table is ready, too."

"Why," exclaimed Sue, "it's dreadful cold. Who would want to eat outdoors to-day?"

"I know it is cold," Aunt Mary replied, "and for that reason I must be all the more particular to spread a nice feast outdoors, for I have four guests who come to eat there every day."

"Sue was very much puzzled, and she watched curiously while Aunt Mary brought out a piece of suet and a slice of bread, and cut them into small pieces.

"The table is under the elm tree, just outside the dining-room window, and the guests are a squirrel, a bluejay and two little birds called sapsuckers."

"Oh!" exclaimed Sue, beginning to understand.

"I like to feed them at dinner time," Aunt Mary continued, "because then I can watch them while I eat my own dinner. They have been lots of company for me this winter."

"Oh, I should think it would be nice!" exclaimed Sue. "Can I help set their table?"

"Yes, indeed," answered Aunt Mary; and then they went out together to the little shelf under the elm tree, and there they scattered the bits of bread and suet.

"The suet helps to keep them warm in the cold weather," Aunt Mary explained, as she placed the last piece upon the board.

Then they hurried in, for it was cold, as Sue had said, and in a moment more were ready for their own dinner, for Aunt Mary lived alone, and Sue had come to spend her holiday vacation with her.

It was only a few minutes before one of the little sapsuckers appeared, and began to peck eagerly at the suet. He was working busily away, when down the tree came the squirrel. The little sapsucker hastily caught a bit of suet in his bill and flew back to the limb of the tree.

"Oh, that is too bad," exclaimed Sue. "Won't they eat together?"

"No," said Aunt Mary. "Sometimes the squirrel and the bluejay will eat together for a time, for the bluejay is nearer the squirrel's size, but the little sapsuckers are afraid of them both, and usually the squirrel is king of the feast."

Just then a gorgeous bird, which Sue knew from the color of its feathers must be the bluejay, came boldly down beside Mr. Squirrel. He fluttered his

wings as though for a sign to the squirrel to leave, but the squirrel did not think he had had his share, and nibbled away on his bit of bread. Pretty soon he took another piece and ran with it up the tree. The bluejay flew off with a piece of suet, and in a twinkling the two sapsuckers flew down and began to eat.

"It's just too funny," said Sue, "the way they take turn about. I wish they would all come and eat peaceably together."

"I wish they would," said Aunt Mary, "but they have not become that friendly yet. Perhaps they may before the winter is over, but I am afraid not. I notice, though, that each one seems to get his share of the feast."

Just then Sam, Aunt Mary's cat, jumped upon the sewing machine which stood in front of the window.

"Oh!" said Sue in alarm, ready to run and take him down; but to her astonishment the two little birds went calmly on eating, and paid no attention to Sam, while Sam himself sat quietly by and watched the birds at their dinner.

Aunt Mary noticed Sue's look of amazement, and laughed.

"I don't wonder that you are surprised," she said, "but both Sam and the birds have learned that there is a good thick pane of glass between them. When they first began coming Sam was quite excited. He jumped upon the machine, scratched upon the glass, and of course frightened both birds and squirrel away. Then when they came again, he tried jumping for them, but he found that he only dashed his foolish little head against a very hard window pane. The birds, too, soon found that he could not reach them, and now they eat, as you see, while he sits and watches them."

Sue had almost forgotten her own dinner in her interest in the small visitors in "feathers and fur" just outside the window, and during all the rest of her stay with Aunt Mary she enjoyed her dinner more than any other meal, for she never tired of watching these small guests who seemed to find something different to do for her amusement every time they came to their outdoor table.—*J. D. Cowles, in Kindergarten Magazine and Pedagogical Digest.*

Messrs. L. Higgins & Co., Moncton, N. B., are sending out a very attractive advertisement, having as a centre piece the pictures of the "Founders of the Dominion." It is sent by mail, pre-paid, to any address for forty cents.

Talks With Our Readers.

"SUBSCRIBER" thinks it would be charming to start a literary correspondence club on some page of the REVIEW, to which literary people, students and teachers could send questions regarding the author, (whoever is selected), and his poetry and writings. Also that a number of competitive questions on the author and his work be submitted every month to the corresponding editor, these questions to be answered by the members of the club. "Subscriber" adds: "I think that either a Browning or Tennyson club would make a very strong appeal to the readers of the REVIEW."

The idea is a good one, and the editor would be glad to consider details personally or by letter, if "Subscriber" will favor him with her address.

A "HIGH SCHOOL TEACHER" who has been especially interested in the efforts of the Nova Scotia teachers to remedy the defects of their high school course, suggests that the high school of New Brunswick is in as serious a condition as that of the sister province. He asks, "when will the educational authorities here have the courage to grapple with the questions?"

The two greatest needs in the high school at present are, to lessen the pressure by reducing the number of subjects taught, and to provide optional courses. The latter would entail considerable additional expense, and would perhaps be out of the question in any but our largest communities. How to secure the best results from efforts and the money spent on our high schools is worthy of consideration, and the columns of the REVIEW are open to our correspondent or to those who have something tangible to offer.

A correspondent would like to see Dr. A. H. MacKay's address on the study of Latin published in the REVIEW, and adds: "I think those great debates on school questions, as that for instance which occurred last summer in Nova Scotia, stir up people and have a great educational effect on the community."

Dr. MacKay's address is published in full in the N. S. Journal of Education for October last.

"SUBSCRIBER":—"I have had considerable difficulty in teaching Hay's History of New Brunswick to my pupils. It seems too difficult for them to understand. Do you know of any way by which it could be made easier and more interesting to the

pupils? If so, I hope you may have time to publish it in the REVIEW, so that this difficulty may be remedied by your kind help."

It should not be difficult to arouse the interest of children in the story of their country. That was the special aim in view in writing the history, and many children have read it with the same zest as they would any other story. "Subscriber" may be helped in reading on another page how one teacher interested her children in history.

CURRENT EVENTS.

Alzen is the name given to a new metal composed of two parts of aluminum and one part of zinc. It is as strong as iron, takes a high polish, and does not rust as quickly as iron.

Esperanto is making greater progress than did any other proposed international language, and it is expected to come into general use as a means of communication between men of different nations who do not understand each other's native tongue.

English capitalists have closed a contract with the government of Newfoundland for a fast steamship service between St. Johns and a port on the Irish coast.

Russia will begin the withdrawal of troops from Manchuria without waiting for the 25th of April, the date fixed by the treaty of Portsmouth.

The greater part of the city of Kingston, Jamaica, was destroyed by earthquake on the 14th of January. Fire followed the earthquake, and many lives were lost. The Dominion government has given \$50,000 towards the relief of sufferers, and the United States government sent prompt assistance.

Much indignation was felt when it was reported that the admiral in command of the United States ships at Kingston had taken matters in his own hands, landing armed men on British soil and raising the United States flag; but it has been explained later that he landed men under arms at the request of the local police inspector to overawe the convicts in the penitentiary who were supposed to be on the point of rising, and that he recalled them on the same day at the governor's request. The naval officer in command of a British ship, which arrived later, offered to send men ashore if needed, but his offer was declined.

Nearly one hundred thousand immigrants from the British Isles, over fifty thousand from the continent of Europe, and over sixty thousand from the United States were added to the population of Canada in 1906.

Lord Strathcona has agreed to give \$2,500 a year for five years for excavations among the Hittite ruins in Asia Minor. Two thousand inscribed tablets have been found in the ruins of one of the Hittite cities. Important discoveries in ancient history are expected.

Recent discoveries in Central Asia include some ancient manuscripts on birch bark, together with paper manuscripts probably belonging to the eighth century of our era.

A German inventor is able to send messages over a distance of twenty-five miles by wireless telephone, and be-

lieves that the possibilities of extending the distance are almost limitless.

A new electric light filament has been invented which requires less than one-fourth the energy to give the same light as given by the carbon filaments now in use.

The Shah of Persia died on the 8th of January, and was succeeded by his eldest son, Mohammed Ali Mirza. The new Shah is familiar with European affairs, and is said to have approved the great political change which marks the close of his father's reign, the calling of a National Assembly. The new Assembly met on the 3rd of January, but five days before the death of the late Shah. It has control of financial matters and public works, but only an advisory voice in matters of administration.

A projectile that takes photographs is another German invention. It is in the form of a shell enclosing a camera, the shutter of which works automatically as the projectile begins to descend, thus obtaining a picture of a broad expanse of country.

Pneumatic locomotives in use in German mines have an air tank in place of a steam boiler. The air is stored at high pressure; and its expansion gives a safe, reliable and cheap power.

SCHOOL AND COLLEGE.

Mr. Elmer E. King, for twenty years principal of the Loggieville, N. B., school, and a native of Kings County, died recently after a short illness of pneumonia. He was an estimable citizen and a competent instructor.

Among the candidates at Acadia University for the Rhodes scholarships to be awarded this month is Arthur Estey, of Fredericton, nephew of Mr. J. W. Spurden, manager of the People's Bank.

Mr. J. V. Lynn has resigned his position as instructor in manual training at the N. B. Normal School to assume a similar position at Calgary.

Mr. C. J. Mersereau, M. A., has recently been appointed principal of the Horton Academy, Wolfville, an institution in which he has taught with distinguished ability for several years.

Dr. Ernest Rutherford, Macdonald Professor of Physics at McGill University, has resigned to accept the post of Langworthy Professor and Director of Physical Laboratories in the University of Manchester.

Principal W. B. Shaw, recently of the Bristol, Carleton County, superior school, is at present teaching in the Industrial School near Red Deer, Alberta, and finds the work quite interesting.

Principal E. B. Smith, of the County Academy, Port Hood, C. B., is receiving deserved commendation for his excellent management of the schools of that town. *Greetings*, the local paper, says: "Parents and children here and elsewhere in the County of Inverness who have pupils attending must certainly appreciate the good, substantial educational work which is being done here."

On Friday evening, December 21, the students of Guysboro, N. S., academy called upon their principal, Mr. W. W. Herdman, and presented him with a complimentary address and a handsome sterling silver writing set. Mr.

Herdman replied, thanking the students for their kindness and good-will. The attendance at the Guysboro Academy this year is the largest on record, many students coming from different points of county. Mr. Herdman is a Pictou boy, a splendid teacher, and well regarded by those of whom he has charge.

The Fredericton Board of School Trustees have decided to introduce regular musical instruction in the public schools under their charge—a wise and progressive measure which it is hoped may be speedily followed in other communities.

Mr. Wm. R. Shanklin, recently a member of the staff of the School for the Deaf, Lancaster, has been appointed principal of the Newman street school, St. John. Mr. Shanklin has had considerable experience, and has shown much skill in teaching.

Mr. John G. MacKinnon has been appointed teacher of grade six, Leinster street school, St. John; not of the Douglas Avenue school, as stated last month.

RECENT BOOKS.

One of the great needs at this and all seasons of the year is the *Canadian Almanac* for 1907, published by Copp, Clark & Company, Toronto. The writer inquired for it at several of the city bookstores about the tenth of January, and the reply was, "All sold out; another lot ordered." Everybody seems to need the concise summary that is found in this invaluable publication—the astronomical and meteorological calculations, commercial reports of Canada, short history of the Dominion, Canadian banks and other public institutions, forms of government throughout the world, British army and navy, Canadian militia, post offices and railroad stations in Canada, officials of all grades, and the clergy, lawyers, *et als*, of the Dominion and the provinces, educational institutions, societies, Canadian tariff, and information of various kinds such as one needs every day from the first of January to the thirty-first December.

Messrs. Ginn & Company, Boston, publish two books that will prove of great benefit to students who wish a brief but clear view of history from the earliest times down to the present. The first is Myers's *Short History of Ancient Times* (388 pages, mailing price \$1.25), containing the first part of that author's *General History*, brought down to the period of Charlemagne. The second is Myers's *Short History of Mediæval and Modern Times* (438 pages, mailing price \$1.30), the companion volume to the *History of Ancient Times*, containing the record down to modern times. These books should be in every school library, furnishing as they do an interesting, authentic and concise account of the world's doings, available to every student.

Messrs. Geo. Philip & Son, London, publish an *Outline Elementary Atlas of Comparative Geography* (price, one shilling), containing a series of 32 outline maps on drawing. The series forms a very useful set of outlines for map drawing.

Messrs. Blackie & Son, London, publish a *Nature-Knowledge Diary*, compiled with notes on nature-study by W. Percival Westell. These notes are very simple and concise, and the Diary is an excellent *vade mecum* to the

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RECENT MAGAZINES.

That grand old magazine, the *Atlantic Monthly*, which celebrates its Jubilee this year, begins 1907 with an excellent number, varied to suit the tastes of its readers. No stories recently published in the *Atlantic* have met with greater success than those by S. Carleton, a resident of Halifax, Nova Scotia. "The Lame Priest," "The Sound of the Axe," "The Frenchwoman's Son," and "The Whale" will be recalled with pleasure. The January *Atlantic* has an article by Professor Archibald MacMechan of Dalhousie University which all readers and teachers of Longfellow's *Evangeline* should read. It is corrective.

Eight illustrated articles and four articles without illustration, all by specialists and writers of note, together with six short stories by leading writers of fiction in Canada, besides a liberal insertion of poetry and light material, is the programme furnished by the *Canadian Magazine* for the first month of 1907. *Canadian Artists Abroad* is an appreciation of the work of two eminent Canadian artists—Morrice and Hill, the latter a sculptor.

The persecution of the Prussian Poles, in connection with the attempt to Germanize the people of Prussian Poland by forcing them to use the German language in the schools for religious as well as secular instruction, has not attracted the attention in this country which its importance deserves. The article on this subject by "Posen" in *The Living Age* for January 5 describes the great school strike of Polish children to which this attempt has led.

The *Delineator* for February contains much lively reading matter in addition to its fashion plates: *The Making of a Charming Woman*, by an "Old Beau"; *The Funniest Valentines*, by the Funniest People; *Talks on Home-making*, by Alice M. Kellogg; *The Miller and the Mouse*, by Grace MacGowan Cooke, and other bright articles and stories.

The *Chautauquan* is publishing a series of articles, of which numbers one and two have appeared in December and January, entitled "A Reading Journey in English Counties." The journey begins with the border and lake counties and will end with Cornwall. The articles are fully illustrated, and so far have been of decided interest.

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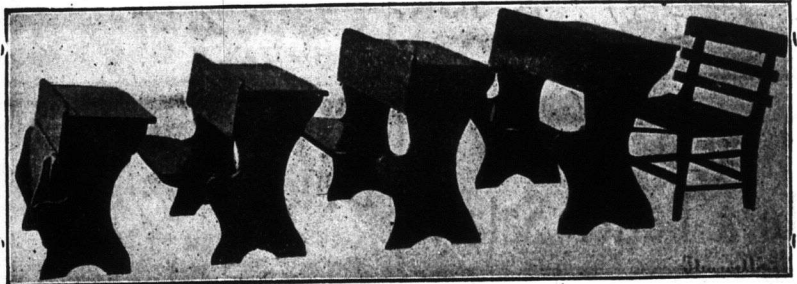
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