The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

PUBLISHED MONTHLY. ST. JOHN, N. B., MAY, 1888. VOL. I. No. 12

A. H. MacKAY, B. A., B. Sc., Editor for Nova Scotia.
ALEX. ANDERSON, LL.D., Editor for P. E. Island.
G. U. HAY, Ph. B., Editor for New Brunswick.

SUBSCRIPTION PRICE:

Twelve Numbers, - - - - - - - - - - $1.00
Single Copies, - - - - - - - - - - 10 cents

Subscriptions payable in advance. Send money by money order, or by bank bill in a registered letter. All remittances acknowledged by postal card. Address all business communications and send subscriptions to EDUCATIONAL REVIEW, St. John, N. B.

The REVIEW is issued from the office of Barnes & Co., St. John, to whom subscriptions may be paid if convenient.

CONTENTS:

EDITORIAL— - - - - - - - - - - 225-227
End of Volume I.—The Interprovincial Convention—Some English Views of Education.
EDITORIAL NOTES— - - - - - - - - 228
SKETCH OF REV. DR. FORREST (with portrait)— 229
SCIENCE SERIES— - - - - - - - - - 230-234
Practical Botany, No. 3—Ferndale School, No. 12—Ferndale Notes, No. 4.
ASTRONOMICAL—PROGRAMME FOR ARBOR DAY— - - - - - - - - - - 234
CONTRIBUTED ARTICLES— - - - - - 235-239
Experience in Teaching—Arbor Day.
N. B. Summer School of Science—Educational Opinion. 239-240
School and College—Personal Notes—Question Department. - - - - - - - - - - 241-242
Book Reviews—Exchanges. - - - - - - - 242-243

END OF VOLUME I.

With this number the first volume of the REVIEW is closed. During the eleven months that it has been in existence there have been enrolled as subscribers upwards of one-half of the teachers of the Atlantic Provinces of Canada. This generous support has assured its permanence.

It has largely depended on its merits to increase its circulation. Its editors have not been able amid the pressure of other duties to devote any extraordinary means to extend its circulation. The little leisure that has been afforded them has been devoted to making the REVIEW helpful to their fellow-teachers. That their efforts have not been in vain, a liberal support and a constantly increasing subscription list abundantly testify.

To the many warm friends who have aided and encouraged the REVIEW we extend our liveliest acknowledgments. Teachers in every position, from the university to the primary school, have given it their unqualified approval and encouragement. The press has commended its aims and the character of its work. Talented contributors have made it more valuable by discussing in a practical and impartial manner important educational questions. Inspectors of schools have, by their unremitting efforts in behalf of the REVIEW, extended its circulation; and it is but due to these gentlemen to say, that owing to their unselfish labors the REVIEW to-day is self-supporting.

With such encouragement the promoters of the REVIEW assure their readers that they will endeavor in the future to make it more than ever worthy of their support.

A glance through the columns of the REVIEW for the past year shows the progressive character of its work. Its pages have been devoted to the interests of the teachers of the Atlantic Provinces. Especially has it been the means of creating a wider and deeper interest in natural science subjects, and no expense has been spared in so illustrating these subjects as to make them available in the class-room.

The value of the lessons of the "Ferndale School" series in directing attention to insects injurious to vegetation; how to recognize them; the study of their life-history, and how to lessen their ravages, has created an interest that has extended beyond the school-room. We have been unable to supply the demand for earlier numbers of the REVIEW containing this series. It is in contemplation to publish the series in book form, revised and re-written.

We have been slow to fill the pages of the REVIEW with "ready-made" lessons, but we have aimed to supplement deficiencies in our text-books and give such hints and material as the progressive and intelligent teacher could use with advantage in preparing for the work of the class-room.

Sketches of eminent teachers, natives of these provinces, who have won distinction at home and abroad, have lately appeared in the columns of the REVIEW. These will be continued in the future,

Not the least pleasant feature of the year for the editors of the REVIEW has been the consideration with which their patrons have overlooked any irregularity and omissions. Where subscribers' names have had, in many cases, to pass through several hands and were hurriedly written, it was impossible at all times to guard against error. We have not received a single ill-natured complaint during the year, while the kind and courteous manner in which our correspondents have preferred their requests, has made it a very great pleasure to attend promptly to them.

In this connection we may mention the very cheerful and hearty co-operation of our publishers—Messrs. Barnes & Co.—as well as every one in their establishment, to ensure the prompt and careful distribution of the REVIEW. The care that has been taken to make the REVIEW first-class in its mechanical arrangement has been so fully shown in every issue during the year that we need only make a passing reference to it here.

The total number of copies of the REVIEW issued during the year, including this number, has been 21,350 copies, or an average of nearly 1,800 copies a month. Thus it will be seen that the REVIEW has been an excellent advertising medium during the past year, and it is every day becoming more valuable.

SPECIAL NOTICE.

Will the few subscribers who are in arrears from the first of our year kindly remit at once, so that we shall not be put to the necessity of specially reminding them. Our expenses each month are heavy and we desire to meet them promptly. Let us begin a new year with all old scores wiped out.

The next number of the REVIEW, beginning Vol. II., will be issued the 10th of June, the anniversary of the day on which Vol. I., No. 1, was issued. A full programme of the Interprovincial Convention will be published, a sketch and portrait of Dr. Th. H. Rand, and other interesting matter. This edition will amount to 3,000 copies. Those of our readers whose subscription has expired will please notify us of a desire to renew, in order that they may receive the paper promptly.

THE INTERPROVINCIAL CONVENTION.

Very satisfactory progress is being made in the arrangements for the Interprovincial Convention. The Committee of Management have so far had the most cordial and gratifying responses from the gentlemen selected to address the Convention at its various sessions. The committees which have the work of the sections in charge have arranged excellent programmes, and have been singularly fortunate in their choice of assigning the work to representatives of our provincial teachers. The local arrangements are in the hands of an energetic committee whose names are a guarantee that nothing will be left undone to make the conditions under which the Convention will meet entirely favorable. The greatest interest and enthusiasm prevails among the teachers generally with respect to it, and it seems safe even at this distance, to say that in this Convention, St. John will see the greatest educational gathering which has ever taken place in the Atlantic Provinces.

A full programme of varied and interesting exercises is rapidly approaching its final shape.

The meeting will be a memorable one in many respects, and will possess, in addition to its programme of purely educational work, many features of popular interest.

The list of speakers, it is hoped, will include such distinguished names as Sir William Dawson; Col. Francis W. Parker, of Quincy and Cook Co. fame, the author of inspiring educational books, the great American exponent of the "new education;" Dr. Schurman, of Cornell, a native of our own Maritime Provinces, who has won an eminent place as a scholar and a teacher; Principal Rand, the organizer of free school education in Nova Scotia and New Brunswick, and the honored head of one of the foremost denominational colleges in Canada; Sir Leonard Tilley, whose connection with the development of education in New Brunswick is a matter of history, and whose deep and unfailing interest in the progress of education is as fresh as ever; Judge King, who, if not the father, is certainly the god-father of free schools in New Brunswick, whose enlightened statesmanship gave this Province the priceless blessing of free education; Premiers Blair, Fielding and Sullivan, as representatives of the present administration of education in the Maritime Provinces; Superintendents Crockett, Allison, and Montgomery, heads of departments, together with prominent educational workers in normal schools, inspection, secondary and common schools.

Public meetings are to be held each evening, at one of which the Presidents and Professors of the leading

Maritime Province Colleges are to discuss a popular phase of collegiate education, and this session promises to be one of the most interesting of the convention. The presence and the words of such men as Dr. Sawyer, of Acadia, Drs. Inch and Harrison of Mt. Allison and the University of New Brunswick, Dr. Forrest, of Dalhousie, and their fellow-laborers in collegiate education, cannot fail to be both inspiring and instructive. All classes of educational workers will find in this meeting features of peculiar interest to themselves.

The bringing together of the teachers of the three Provinces for deliberation on the problems of education, the social and professional advantages which ought to result from this, the enlargement of the educational horizon which our provincial relation has hitherto prevented, the development of the *esprit de corps* of the profession, and the stimulation of public interest in educational work and educational workers must prove a great advantage to teachers and to the cause of education.

The attractions of this meeting will be so many and so various that we believe no progressive teacher can afford to miss them. And the old Mechanics' Institute, in St. John, in which so many important public meetings have been held in the course of its long and useful life, ought to take a fresh lease of usefulness from receiving within its time-honored walls a gathering so representative of the culture, the eloquence, the wisdom and experience of the Maritime Provinces.

SOME ENGLISH VIEWS OF EDUCATION.

A report of twenty-one folio pages has been received by the London School Board (Great Britain) from a special committee appointed by it a year ago "to consider the present subjects and modes of instruction in the Board schools, and to report whether such changes can be made as shall secure that children leaving school shall be more fitted than they now are to perform the duties and work of life now before them." In the course of an able editoral on this report, *Nature* says "its main criticism is 'that the physical or bodily side of education, including the development of muscular strength, of the accuracy and sense of color and proportion of the eye, and of the pliancy and dexterity of the hand, is almost entirely neglected; and that the mental or brain work, which occupies the great bulk of the time in schools of all kinds, is composed for too much of appeals to the memory only, resulting at the best in the retention in the child's mind of a mass of undigested facts and far too little of the cultivation of intelligence.' The kindergarten principle is strongly approved of, and the first recommendation is 'that the methods of the kindergarten teaching in infant schools be developed for senior scholars throughout the standards in schools so as to supply a graduated course of manual training in connection with science teaching and object lessons.'" "On one point," *Nature* continues, "the committee is very distinct, and there is a singular unanimity among the witnesses that the attention now paid to spelling and grammar is excessive if not entirely worthless. There is a curious table, too, in the appendix, which gives the result of inquiry as to the subjects of instruction most or least preferred in the various schools. Grammar is so unpopular with both boys and girls that it almost always attains that bad pre-eminence. Spelling or dictation comes second. In fact, there is no doubt that the children dislike what they feel does not add either to their pleasure or their real knowledge. It is proposed that the time now given to spelling, parsing, and grammar generally, be reduced."

It is not long since the School Boards of London, Liverpool, Bradford, Birmingham, and other towns to the number of over 120, asked for a Royal Commission of Inquiry with reference to English spelling reform. A capital summary of the English view is published by MacMillan & Co., London, from the pen of Dr. Gladstone, Fellow of the Royal Society, and member of the London School Board. This small volume of eighty pages gives a careful, deeply interesting and comprehensive view of what the irregularities of English orthography cost the English people as compared with educational systems of other leading peoples of Europe. The literature on this subject is already becoming quite extensive, and it is the duty of educationists to study the subject long before any action should be taken.

In the *Swiss Cross* for May is a suggestion from Mr. Jas. Vroom, of St. Stephen, proposing the formation of a Gray club in every large chapter of the Agassiz Association, as a fitting memorial of the late Professor Asa Gray. The objects of the club would be "to record all the native and introduced plants found growing uncultivated in the neighborhood; to encourage original observation on the part of the members, and to make public in some way any discoveries that seem to the club to be of special interest." The editor of the *Swiss Cross* states, that by a pleasing coincidence, such a memorial chapter was completing its organization just as Mr. Vroom's suggestion came to hand.

EDITORIAL NOTES.

We remind contributors to these columns that we desire to know their names before their contributions can be inserted.

The excellent and practical suggestions which our correspondents have made in regard to tree planting on Arbor Day, will, we hope, be carefully studied and faithfully carried out.

In another column we publish, under the head of "Educational Opinion," some of the views of inspectors and others, whose observation and experience enable them to speak with weight on the merits and defects of our common school education. Especially are school inspectors enabled to form accurate judgments. These opinions, which we hope to continue in next issue, while they are assuring and satisfactory in regard to our progress, are critical in pointing out where defects exist and what remedies may be applied.

The various County Academies of Nova Scotia, according to the local newspapers, have had their terminal written examinations in April. Although not required by law, this procedure has, within the last few years, been adopted by nearly all the academies and many of the more advanced high schools.

Attention is directed to the advertisement in another column of the Summer Course in Modern Languages which is proposed for St. John and Fredericton. The Berlitz Schools of Languages are deservedly popular, and we are glad that teachers and students here are to have an early opportunity to become acquainted with their methods.

The death of Matthew Arnold removes from the English world of letters a notable figure. A poet, critic, scholar, his works are models of a pure and vigorous English. A son of Dr. Arnold who made Rugby school so famous, he was himself well known in educational ranks from the excellent service he rendered at different times to public education. He was for several years an Inspector of Schools in England, and afterwards was appointed a commissioner to visit the continent and report on the system of popular education in France, Germany, and other countries. He visited the United States in 1883, and again in 1886. His unfavorable criticism of American life and manners caused considerable irritation to citizens of the republic. During his later years Mr. Arnold had devoted himself to prose, of which he was an acknowledged master.

Progress, the new weekly published in St. John, is a journal of considerable promise, and gives evidence of marked ability on the part of its editors, Mr. E. S. Carter and Mr. W. L. Sawyer. We wish its talented editors that success which their enterprise deserves.

There appears to have arisen some trouble about the choice of an Arbor Day for the City of St. John. The day chosen for New Brunswick is the 18th of May, a public holiday for the cities of St. John and Portland, and the regulation provides that the day set apart for that purpose shall be a regular school day. We hope that Arbor Day will not be allowed to pass unobserved in the two cities.

What better way of commemorating the landing of the Loyalists than to make a Memorial Day in which the school children would take part, one of the features of which would be the decoration of our bare streets and squares by the planting of trees in remembrance of those sturdy fathers who planted homes here a century ago? Cannot our energetic Board of School Trustees, aided by public-spirited citizens, take the matter in hand at once and assist the school children to make Friday, May 18th, 1888, the initial day in this movement?

No one who visited the studio of Mr. J. C. Miles and his son at the recent exhibition of the work of their students could fail to be impressed with the importance of what is being accomplished there in the way of technical training. For several years the Messrs. Miles have, in their free school, taught many young persons the elements of free-hand drawing. Among these are young men engaged in mechanical pursuits, who have derived great practical benefit from the valuable course of instruction given. Among the pupils whose work called forth favorable comment at the recent exhibition, there were representatives of many industrial occupations, as well as teachers, and students preparing for courses in engineering and architecture. What an excellent opportunity does such training give to those who are ambitious to excel and become leaders in their occupation, and how it points out the necessity of the Government and the City assisting to make some provision for technical training, by the establishment of a school for that purpose. The "Daily Sun," a few days since, pointed out that "If the Messrs. Miles, without financial assistance, have been able to accomplish much and to continue the school so long, it is evident that the school board, or some such association as the Mechanics' Institute, could take up the work, give it a wider scope, and greatly enlarge its usefulness."

REV. PRESIDENT FORREST, D. D., F. S. Sc., (Lond.)

The University of Dalhousie College has of late been developing with extraordinary rapidity. Wealthy friends have been pouring in money, founding chairs and scholarships. The Faculty of Arts has added to it those of Law and Medicine. And, last of all, the new building has been formally opened, though not yet entirely completed, on Convocation Day, April 26th, by an "at home," where, from 8 to 11 p. m., about 1,700 of the *elite* of Halifax and the Province were present. This acceleration in the heretofore steady growth of the Provincial University of Nova Scotia is contemporaneous with the governorship and presidency of a man of extraordinary energy and business capacity. John Forrest, the subject of our brief sketch, was born in the County of Pictou, Nova Scotia, November 25th, 1842. He thus forms one of a notable Pictovian trio of Canadian University Presidents—Sir William Dawson, of McGill, Dr. Geo. M. Grant of Queens, and Dr. Forrest, of Dalhousie. In 1856 he entered the Free Church Academy in Halifax. In 1858 and 1859 he prosecuted his studies in the Presbyterian College at Truro. In 1861, at the early age of 19 years, he was appointed to a position in the Free Church Academy, and his energy did much to win for this institution its well merited reputation. In 1866 he was ordained a minister of St. John's Presbyterian Church, and from that time forward he was in the head and front of every philanthropic movement and effort in Halifax. In 1877 he was appointed a governor of the University. And some time later he made a personal and extensive study of the appliances and methods of work in the leading universities of the United States, with a special view to the future of Dalhousie. These studies were co-ordinated with the experience of the other Professors of the Faculty in the leading universities of Great Britain and Germany, in arriving at present results. In 1880 he was appointed "George Munro" Professor of History and Political Economy; and in 1885 he was unanimously elected President of the University. In 1886 he received the degree of D. D. from the University of Queens, and was elected a fellow of the Society of Science, Letters and Art, of London. As a lecturer his fluency and vigor of expression give him special power in the treatment of historical and political subjects. And the enthusiasm which characterizes him in all his work passes as an inspiration of energy into the minds of his students, in each of whom he appears to have time enough to manifest a personal interest. Under a genius so well fitted to push the interests of the University, and with a *Senatus academicus* containing some of the ablest scholars, in their special departments, of which Canada can boast, and with a building so thoroughly adapted to the requirements of modern demands, the University of Dalhousie promises to give the city of Halifax, both at home and abroad, a reputation and prestige which all its other great natural advantages have never, and could never obtain for it.

THE National Education Association of the United States, will meet this year in San Francisco on the 17th July—the same day on which the Interprovincial Association meets in St. John—and continue in session until the 20th July. For the sake of comparison we give the topics that will engage the attention of our fellow-workers across the border:

1. Literature in the reading courses of public schools. 2. How can our schools best prepare law-reverencing and law-abiding citizens? 3. Current criticism of our school system and what answer? 4. Practical education. 5. The relation of the state to school books and appliances. 6. What is needed in our educational system to secure respect for common labor or way-working. 7. Spelling reform.

We have received circulars in connection with this Convention of the National Educational Association of the United States, to be held in San Francisco in July next. From 7,000 to 10,000 teachers are expected to be in attendance. Great preparations are being made by the whole State for the great event. Last year the Convention was held in Chicago, which appropriated $25,000 for the purpose, and the States of Illinois and Iowa respectively $2,500 and $5,000. New Brunswick and the City of Saint John are interested in a proportional degree in the Interprovincial Convention to be held about the same time.

PRACTICAL BOTANY.

No. III.—The Violets.

About ten species of violet are found in these Provinces, including the pansy of the gardens. This latter finds a place among wild flowers because it shows a tendency to escape from cultivation. It may often be seen growing wild, but a neglected garden in the vicinity will perhaps indicate whence it comes.

Most of our violets appear in May, but the present season is so late that June will be here probably before many of them are found in full bloom. These plants present so many interesting features that they may be made the subject of several consecutive lessons, and indeed may be studied throughout the summer. It is difficult to determine some of the species; but let the first one before the class, perhaps the common white violet, be thoroughly studied, and you will be surprised how readily the quick-witted pupils will notice differences between it and others. (How many know only two species of violet—the common white and the common blue violet; and yet we have three or four species of white violet, several species of the blue and violet blue, one white tinged with blue, and another yellow. All of these may not be found in one locality, but have the pupils institute a thorough search in their neighborhood and perhaps half of the total number of species may be found).

Let us look at some of the General Characteristics of this family of plants. We may conveniently arrange violets into two classes,—the first comprising those species which have leafy stems, and the second those in which the stem is underground, the leaves and flowers from which appear to spring directly from the ground. Notice that in both classes the root-stock or part below the soil is an underground stem, which sends out slender fibres (the real roots) in every direction. This root-stock has certain characters belonging to a stem which a real root never possesses, such as scales or rudimentary leaves, runners or subterranean branches which are produced later in the season. These runners sometimes produce small *flowers*. Flowers? When and where shall we look for them? What are they like? Yes, they are flowers, and you will require to search carefully for them. Later in the season and throughout the summer, if you examine the common white violet you will find small inconspicuous flowers, without any white petals. They are very minute and look like tiny buds. They may be found among the clusters of leaves, under or around which they are almost hidden. Sometimes they are found beneath rubbish about the roots. Although these flowers have no petals, they have distinct sepals (how many?) closing tightly around a pistil, with rudimentary petals (how many?) and stamens (how many?) Thus it will be seen that these flowers possess all the parts that flowers usually have—pistil, stamens, petals (incomplete and only rudimentary) and sepals. They are of great importance, however, as several species only perfect seeds by means of these little flowers. A small magnifying glass may be needed to make out some of the parts.

Probably the first violet brought into class for examination will be a stemless variety—either the common white or the blue violet. Have the pupils sketch the plant as a whole and then by parts. Commence at the root-stock. Try to familiarize the pupil's mind with the idea that it is an underground stem. Name other plants that have stems which lie on the ground or under it—the Solomon's seal (an interesting example), the raspberry, the couch-grass, the potato and many others. The leaves rise from the root-stock on wide petioles. They may differ somewhat in shape even on the same plant (this is especially the case with the two common species above named), but their general shape may be determined after careful comparison and study. The flowers are borne on the end of a stalk called a scape (notice whether there are any little bracts on this scape). The calyx with its five green sepals forms a cup for the rest of the flower (notice if there are any flower buds, how this protects the more delicate parts inside). Notice the appendage or little ear at the base of each sepal. The corolla has five petals. Let each petal be pulled off and sketched separately, describing particularly the size, veins, bearding. Notice that the lower petal is somewhat larger than the others and prolonged backwards to form a spur. (Whether this spur is long or short, stout or slender, is of importance further on in assisting to determine one species from another). This spur or sack serves as a reservoir for nectar. (Bees, butterflies and other insects visit flowers to obtain this nectar, which some of them elaborate into honey. Is the plant robbed of its nectar by these insect plunderers or does it receive anything in return? The more advanced pupils may be told that flowers are fertilized by the agency of insects. (Read Sir John Lubbock's "British Wild-flowers in relation to Insects," or Gray's "How Plants Behave.") Sometimes the side petals alone are bearded. Notice how the stamens closely surround the pistil. They are short, and it may be noticed that some are slightly united at the base. How many stamens? What are the anthers? What do the anthers contain? What are the filaments? What do you notice about those filaments that are opposite the lower petal of the corolla? Point out the pistil and

its parts—the lower portion, called the ovary, in which are the rudimentary seedlings, the style, and the stigma which is turned to one side.

Notice that the flower is formed on the plan of five—five sepals, five petals, five stamens. Look for other flowers that have their divisions in fives; those that have them in fours, in threes. (The Trillium is a good example of this latter plan).

A description of the less common species of violet is here given. Should any insurmountable difficulty arise in determining a difficult species, it may be referred to the Question Department of the REVIEW.

THE LANCE-LEAVED VIOLET (*Viola lanceolata*, L.)

is shown in the margin in its natural size. It is found in wet places, on the pebbly shores of lakes or streams, and on the borders of swamps. It is distinguished by its erect lanceolate leaves which taper into margined petioles. Its flowers are white, with lilac veins, and very closely resemble those of the common white violet, except that the latter are faintly sweet scented. It is quite common in the southern part of the province of New Brunswick.

THE PRIMROSE-LEAVED VIOLET (*Viola primulæfolia*, L.)

is not so well known in these Provinces. It is found in the same situations as the lance-leaved violet, preferring moist places. Its leaves are oblong or ovate, somewhat heart-shaped at the base, with white petals marked with purple lines at the base. It has a creeping root-stock, and has smaller flowers than the lance-leaved form. It has been detected only in Charlotte County, in New Brunswick.

THE COMMON WHITE VIOLET (*Viola blanda*, Willd.)

is too well known to need a minute description here, and so is

THE COMMON BLUE VIOLET (*Viola cucullata*, Ait.)

The latter is very variable in size and shape of leaves, and it is sometimes found with white flowers.

Viola renifolia, Gray, is a species that requires some attention from the students of our flora. It is reported from New Brunswick, but seems to run very closely into the common white violet. It differs from the latter, in having reniform or kidney-shaped leaves, and is very pubescent, or hairy.

THE GREAT SPURRED VIOLET (*Viola Selkirkii*, Pursh, Goldie, 1822),

is a small and delicate species, quite rare, found in shady ravines and woods. It is distinguished by its long spur and its pale, violet-colored petals. It is a stemless species, like all the others mentioned above, and is an interesting and beautiful plant.

Of the stemmed violets the most common is

THE DOG VIOLET (*Viola canina*, L., var. *Sylvestris*, Regel.)

It is found in shady places, has light violet petals, a cylindrical spur half the length of the petals; leaves heart-shaped, the lowest kidney form, with crenate edges. The whole plant is from three to eight inches high. It is common in New Brunswick.

THE CANADA VIOLET (*Viola Canadensis*, L.)

is a large and showy species, often growing in rich woods to a foot in height. Has large flowers, petals white, shading into a light blue beneath, and flowering all summer. The leaves are heart-shaped, pointed, serrate, and are alternate on the stem, with ovate-lanceolate entire stipules. It has been found in rich woods on the upper St. John and its tributaries.

THE DOWNY YELLOW VIOLET (*Viola pubescens*, Ait.)

is an interesting and beautiful species, with conspicuous yellow petals, stems leafy above and bare below. Plant from six to fifteen inches high. Rather common and easily identified, as it is the only yellow violet found with us. [The round-leaved violet (*Viola rotundifolia*, Mx.,) with small yellow flowers, is found in Maine, and should be looked for in the Atlantic Provinces].

OTHER SPRING FLOWERS.

Some of our most beautiful flowers are found in early spring, and, as if to encourage us to study them, they are easily identified.

The MAY FLOWER (*Epigæa repens*); the HEPATICA (*Hepatica triloba*), a lowly modest flower of a pale blue color, with beautifully formed three-lobed leaves, is rare with us, although it should be looked for; the WIND FLOWER (*Anemone nemorosa*), with its pale blossoms, may be looked for on the edges of woods; the COLTS-FOOT (*Tussilago farfara*), with bright yellow flowers very like the Dandelion, but the flowers come before the leaves; the ADDER'S TONGUE (*Erythronium Americanum*) has a beautiful yellow flower, and belongs to the Lily family, as do the Trilliums, which come forth in early spring; the SPRING BEAUTY (*Claytonia Caroliniana*), a beautiful flower, white corolla with delicate rose-colored veins, is one of the earliest and most attractive spring flowers. All these should be in bloom between the 10th and the last of May.

Perfect specimens of all these plants ought to be col-

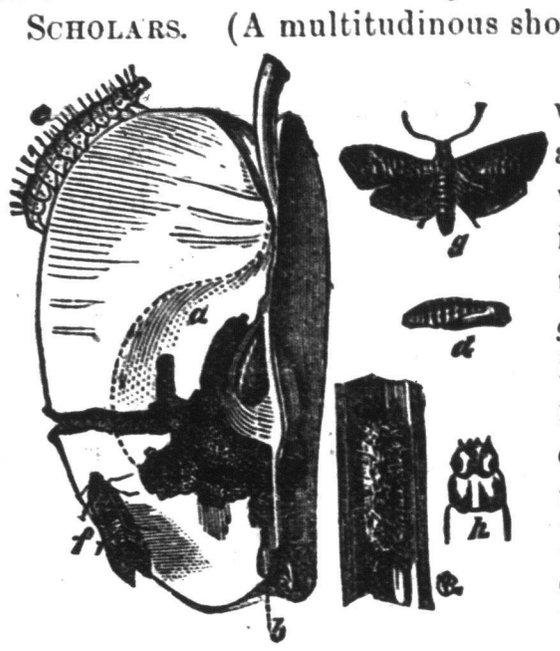
lected and dried for preservation. Gray's "How Plants Grow" contains full directions how to do this. If any correspondents wish it we will give a few hints in our next. In the meantime lay the foundation for a school herbarium by collecting the plants in the neighborhood of the school, especially those that are studied in class. Dry only perfect specimens, such as have root, stem, flower, between several folds of bibulous paper (old newspapers will do very well); change these papers frequently, say every day for a few days. A weight of not less than twenty pounds, and not greater than forty pounds, may be used upon the plants which have been placed in driers between two small boards.

FERNDALE SCHOOL.

No. XII.—The Codling Moth (*Carpocapsa pomonella*—Linn.)

Teacher. How many of you have seen apples eaten into the core in this way?

Scholars. (A multitudinous show of hands).



T. Well, here we have got an apple, the moth which is the originator of all the trouble at *f* and *g*, the larva at *e*, its head magnified at *h*, the cocoon at *i*, and the chrysalis at *d*. Does it do much damage, do you know?

S. Yes; one man said he lost over a hundred bushels of apples last summer by this moth. He called it the "Codling Moth." The apples fall from the trees before they are full grown and they are all worm-eaten within.

T. Correct. The "Codling Moth" is a foreigner. It came across from Europe about the beginning of the century, and of late it has been one of the most destructive pests to the apple-grower. It is estimated that in the State of Illinois, U. S. A., alone, it destroys fruit to the value of $2,750,000. But we know enough now to master it, and to save many thousand dollars in some single counties of our own province. Let us get first its life history, however. About the first week of June, when the apple blossoms open, they may be found on the wing at night, but they hide during day. Will you describe our specimen?

S. Its fore wings have small streaks of grey and brown across them, with a brownish spot and streaks of gilding on the inner hind portion. Its hind wings and body are of a yellowish brown, shining like satin.

T. Very good. Right in the centre of the apple blossom it deposits a tiny yellow egg. In a week or two it may treat as many as fifty blossoms in this way. In a week the egg is hatched and the small larva commences to eat its way into the newly forming apple just as the blossom has withered away. It keeps growing and eating for three or four weeks, and about the first or second week of July it eats its way out of the apple, a full grown small caterpillar. Please describe it.

S. Its head is blackish brown. Its body is flesh-colored and covered with small raised points which bear fine hairs.

T. Correct. It may then let itself drop gently from the apple to the ground by means of a fine thread, and after selecting some shelter or crevice, it proceeds to spin its small cocoon. Often it crawls down the stem of the tree. Please describe the cocoon which is figured at *i*.

S. It looks like paper, white inside, but on the outside there are small fragments of rubbish mingled with fine silken threads.

T. In about two weeks the chrysalis bursts forth from the cocoon into a perfect moth—that is, towards the end of July. These proceed to deposit eggs, as did the first brood, on the apples. The second brood of larvæ sometimes leave the apple before it is collected and form cocoons in sheltered crevices, from which they emerge as moths about the first of next June. But great numbers of them do not leave the apple until after it is collected and barrelled. Have any of you noticed this?

Jim. I have seen a lot of these little cocoons in small crannies under the hoops of apple barrels in winter.

T. What should be done with them?

S. They should all be picked off and killed; because if not, each one may destroy as many as fifty apples next June.

Jim. But how can the cocoons hidden under rubbish in the orchard be found?

T. Not very easily. But this plan has been found to catch them in summer time: A band of cloth at least five or six inches wide is tightly bound around the trunk of the apple tree about the first of June. When the larvæ go to spin their cocoons they generally wander along the trunk of the tree; coming to the band of cloth they find under it splendid shelter, and there spin their cocoons. This band should be loosened and examined once a week and all the chrysalids killed.

JIM. But they say there is a better way lately found out. They spray the trees with water containing Paris Green, and they are not troubled with the insect at all.

T. You are right. Since your plan was discovered only a few years ago millions of dollars worth of fruit have been saved by it in America.

JIM. A neighbor of ours got a force pump and sprayed his trees so thoroughly that nearly all the leaves were withered, and he lost all his apples instead of saving them. What was the trouble?

T. Paris Green contains a deadly poison called arsenic, and if too much is applied even to the leaves of a tree they die.

S. How can people know how much to use?

T. One ounce of Paris Green, thoroughly stirred up in every fifteen gallons of water, is found a good proportion. Paris Green does not dissolve in the water, so that you must remember the water is to be kept well agitated while the spray is being thrown.

JIM. But the apples would be poisoned, wouldn't they, with the Paris Green?

T. The trees are sprayed once, just when the blossom falls, and the apple is very small; so that the amount of poison on one of them would not injure a human being. But before the apples are ripe in autumn every particle will be washed off by the rains.

JIM. But how, then, could the poison get into the core of the apple to kill the boring larva?

T. Where would the larva be just as the blossom is dropping off?

S. It would only be just hatched, and commencing to eat its way into the apple.

T. Correct. And the smallest amount of Paris Green is sure death to it; and some think it also frightens the moth away. Why do they spray the trees, then, just after the fall of the blossom?

S. Because about that time the eggs are being hatched, and the very first food the larvæ try to take poisons them.

T. When is a tree made sufficiently safe by spraying, would you think?

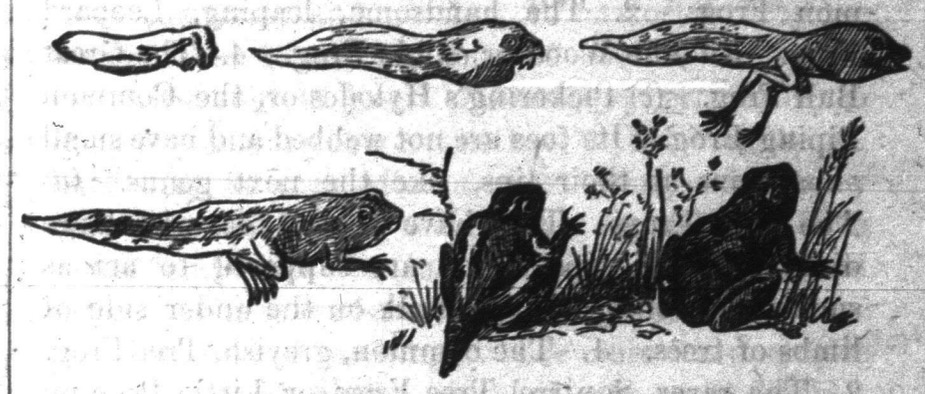
S. When every little forming apple has been touched by the poisoned spray.

T. What precautions should be taken where this remedy is used in an orchard?

VARIOUS S. Not to put more than one ounce in every fifteen gallons of water....To keep the water well stirred....To spray when the wind is calm, in the morning....To spray about the time when the first eggs begin to be hatched....Not to let any animals drink the poisoned water....Not to have any poisoned water and Paris Green where children might get at them....To be very careful always.

FERNDALE NOTES.*

No. IV.—THE FROG AND ITS RELATIVES.



THE DEVELOPMENT OF THE FROG.

The frog belongs to the animal province *Vertebrata* (Latin, *vertebra*, a bone of the back), and to the Class *Amphibia* (Greek, *amphi*, both; *bios*, life). They breathe by gills when young, as fish do in water. When mature, in our species, the gills disappear, and breathing is performed by lungs.

To study the development of the frog, take a pickle jar, with water and a little moss from a swamp, and a small portion of one of the gelatinous masses of frogs' eggs which abound during this month in every section of the country. Change the most of the water daily. The eggs are surrounded by a thick layer of albumen, the same as the white of a bird's egg. This swells very much in the water. When the minute egg is hatched a small tailed animal, like the first above, appears, with a tuft of fringe (gills) on each side of its neck. The hind legs appear, then the fore legs, the gills disappear, and finally the tail. Under a microscope the eggs and young tadpoles are very interesting, as they are more or less transparent, and show, in some stages very conveniently, the circulation of the blood.

Two orders of the amphibia are well illustrated in the Atlantic Provinces. 1. The *Urodela* (Greek. *oura*, tail; *delos*, visible), which never lose their tails. These are wrongly called lizards in these Provinces. But lizards are not *amphibians*; they belong to the *reptilia*. The order *Urodela* includes—(*a*) the Water Salamanders or Newts, which live in water, with tails flattened vertically, four fingers on its fore feet, and five on its hind feet. (Lizards have five toes on each fore foot, and are not found in Nova Scotia). Produced from eggs. Fore feet developed first. One species in collection of Pictou Academy. (*b*) The Land Salamanders. Produced alive. Tail not flattened. Found under old logs, stones, etc.

The second order is *Anoura* (Greek, *a*, without; *oura*, tail. The tails as well as gills of these disappear in the mature animal. We have three genera —(*a*) the Toads, of which one species is common. No teeth in its jaws. Hind limbs not so well developed

or webbed as in the frog. Skin warty and glandular, (*b*) The Frogs, of which four species are found. Teeth always in the upper jaw. 1. The Spring or Common Frog. 2. The handsome, leaping, Leopard Frog. 3. The Wood or edible Frog. 4. The Great Bull Frog. (*c*) Pickering's Hylodes or, the Common Piping Frog. Its toes are not webbed and have small expansions at their tips, like the next genus. (*d*) The Tree Frogs. They have webbed toes with large disks at their tips which are supposed to act as suckers, enabling them to walk on the under side of limbs of trees. 1. The common, greyish, Tree Frog. 2. The rarer, Squirrel Tree Frog, or Little Peeping Hyla, as it has been called.

It will be capital amusement for scholars to find out how many of these may be found in their own school section. Specimens of each kind should be preserved by putting them in a wide-mouthed (glass-stoppered, if convenient,) bottle, filled with alcohol or whiskey, which will preserve them, although with a little change of color. We give the following tabular classification of those at present known to the writer:

Class. AMPHIBIA. (Nova Scotia).

Order I. URODELA.

Genus 1. *Water Salamanders* (*Triton*).
(1) The Water Newt.

Genus 2. *Land Salamanders* (*Salamandra*).
(2) Yellow spotted S.
(3) Violet S.
(4) Red backed S.
(5) Salmon-colored S.

Order II. ANOURA.

Genus 3. *Toads* (*Bufo*).
(6) American Toad.

Genus 4. *Frogs* (*Rana*).
(7) Spring Frog.
(8) Leopard Frog.
(9) Wood Frog.
(10) Bull Frog.

Genus 5. *Piping Frogs* (*Hylodes*).
(11) Piping Frog.

Genus 6. *Tree Frogs* (*Hyla*).
(12) Common Tree Frog.
(13) Squirrel Tree Frog.

ASTRONOMICAL.

"Among the Constellations" must, on account of the pressure upon our space, be relegated to next winter.

THE PLANETS.

Jupiter is in Scorpio, and on the 20th it will be very near Beta Scorpii. It rises early in the evening.

Mars is in Virgo, receding from Spica. On May 5th it was in conjunction with *Uranus*, being only about a moon-breadth distant. It is further west than Jupiter.

Saturn is in Cancer, approaching the cluster Præsepe, which has been taken by some observers for a nebulous comet. It is still further west than *Mars*. *Neptune* is in Taurus. *Venus* rises in the morning a little before the Sun and is in Pisces. *Mercury* will be in conjunction with the Sun on the 10th, when it becomes an evening star, though invisible for some time.

PROGRAMME FOR ARBOR DAY.

Let all in the school district—teacher, parents, boys, girls—be engaged in the work. Meet at nine o'clock, and during the forenoon plant trees, shrubs, the grounds having been prepared beforehand, and in the flower-beds plant seeds and flowers. Make a record, in a book kept for the purpose, of each tree planted.

We will suppose it is noon and all the trees are planted. Then, under some hospitable roof or roofs in the neighborhood, there is an ample dinner prepared by the ladies who have taken a warm interest in the work. This will be an excellent feature in the day's entertainment, and should not be overlooked. A little energy and forethought will secure its accomplishment. Or if the day be warm a pic-nic may be arranged on the school grounds.

After dinner a programme, something like the following, may be carried out:

MUSIC—"Greeting"—by the school.
READING of the Section of School Law setting apart an Arbor Day.
OPENING ADDRESS.
SONG.

WOODMAN SPARE THAT TREE.

Woodman, spare that tree!
Touch not a single bough!
In youth it sheltered me,
And I'll protect it now.
'T was my forefather's hand
That placed it near his cot;
There, woodman, let it stand;
Thy axe shall harm it not.

That old familiar tree,
Whose glory and renown
Are spread o'er land and sea,—
And woulds't thou hack it down?
Woodman, forbear thy stroke!
Cut not its earth-bound ties;
O, spare that aged oak,
Now towering to the skies!

When but an idle boy
I sought its grateful shade;
In all their gushing joy,
Here, too, my sisters played.
My mother kissed me here;
My father pressed my hand—
Forgive the foolish tear;
But let that old oak stand.

My heart-strings round thee cling
Close as thy bark, old friend;
Here shall the wild-bird sing,
And still thy branches bend.
Old tree! the storm still brave!
And, woodman, leave the spot;
While I've a hand to save,
Thy axe shall harm it not. —*G. P. Morris.*

DIALOGUE—in which the pupils urge the merits and beauties of their favorite trees.
ESSAY—Historic Trees.
SONG—"To the Woodland hie away."
ADDRESS—How to Care for Trees.
RECITATIONS—by pupils, on subjects appropriate to the day.
GOD SAVE THE QUEEN.

For the REVIEW.]

EXPERIENCE IN TEACHING—WHAT IS IT WORTH?

"The chief disturbing element in our educational system is an annual access to the so-called profession of teaching of several hundreds of young persons, mostly between sixteen and nineteen years of age."—*N. S. School Report.*

This being the case, can there be any wonder or surprise that our school system has not been as successful as its friends and supporters have wished? For twenty-four years our schools have been largely in charge of untrained boys and girls, "perplexed novices," whose natural resource "is to the practice of pure memoriter text-book recitations, with their consequent intellectual stagnation and sterility, and with the chances strongly in favor of this vicious method perpetuating itself." It is about time for a change in this line. We never could see the justice of the government paying inexperienced teachers the same as it paid experienced teachers of the same class. By so doing there was a premium for the work of the "perplexed novice," and a discount on that of the expert in the art of teaching, so far as the provincial allowance was concerned. This could have been partially remedied by giving a first-class licensed teacher the second-class grant for the first year's teaching, and an increase for the next year, if he prove to be successful. Even a graduate of a normal school should teach a term or two before drawing the allowance of his or her grade. It is to be hoped that the changes foreshadowed in the recent report of Dr. Allison will take place in Nova Scotia, at least, for then our schools will be doing their legitimate work. The common school has no right to teach professional subjects. These are not on either the common school or the academic course of study. Complaints have been made, and reasonabiy so, because of so much time being spent with two or three aspirants for this so-called profession, whilst the rest, especially the younger children, have been neglected. Even our normal schools have not been much more than common schools in this respect, since they have been doing the work assigned to the lower grades. If our normal schools are made, in every respect, what they should be, viz., purely for professional work, adding only such subjects as science, drawing, music, etc., then they would have larger claims upon the country. We have often thought that there should be a mercantile department in connection with these schools, where teachers could receive as good a business education as they could get in any business college. Under a good teacher of book-keeping they would receive more and better instruction in penmanship than is usually given to our teachers, and these then would be able to teach this very important subject much more successfully than they, as a class, have been doing, besides preparing pupils to keep accounts more accurately and neatly. It has often been remarked that it was the duty of the normal school authorities not to grant professional certificates to those pupils who show but little or no teaching talent. Such may be seen after a short time, when they should be advised to seek other avocations. This would tend largely to "an equalization of supply and demand in matter of available teachers as would make the profession of teaching at once more remunerative and more honorable." Again, if each pupil teacher, especially a male, were required to teach say five consecutive years, after graduation or being licensed, ere he began to study for another profession, there would be far less to make teaching a stepping stone to the detriment of "those who propose permanent identification with the profession." The time is come when something should be done to rid the profession of its "stepping stone" excrescences. B.

For the REVIEW.]

ARBOR DAY.

HISTORICAL REFERENCES.

Though Arbor Day is of somewhat recent origin, the importance it has reached throughout the United States and Canada justifies some references to its historical aspect. Probably no movement has spread more rapidly, or become more popular in modern times than this; and not without reason, for it is already bearing most valuable and abundant fruit for the nation, the school, and the home. As a matter of fact, the celebration of Arbor Day has grown out of the necessity of preserving and restoring the forest area. The history of systematic tree-planting reaches backward many years, and the practice developed only as the necessity for it arose in the ruinous effects of forest depletion. When large forest areas were cleared away, it was invariably found that the wealth of the country, the productiveness of the soil, the healthfulness of the climate and the flow of the rivers were very seriously affected. Wise and scholarly men, after much study and a long series of observations, traced these serious effects to their cause, and it was this class of men that brought tree-planting into practice.

Ceylon, St. Helena, Santa Cruz, Algeria, and portions of Germany, France, Spain and Italy, have in past times been reduced to barren and inhospitable wastes by the careless destruction of their forests. Asia Minor has been called the epitome of a dying continent. Ohio has experienced some of the effects

referred to. Twenty-five years ago peaches were raised in abundance in that State, but peach culture in Ohio is a thing of the past. The climate has become colder and more dry and uneven. The springs are later, droughts are frequent, crops of different kinds less abundant and more uncertain, and everybody is familiar with the record of her devastating floods. The record of Nebraska and other Western States, and even of Massachusetts, is somewhat similar to that of Ohio.

It has thus become a well and widely recognized fact that the proper conservation of the forest lies at the very foundation of national prosperity; and having this conviction, several European countries a century or more ago began the work of preserving and restoring their forests. Forestry societies were formed, schools of forestry were in time established, legislation was improved, large and small areas were planted with different kinds of trees; but it was found that the preservation of the forest was dependent upon the due appreciation of its importance and value on the part of not merely a portion, but of all the people. Laws are of little avail unless they are the expression of the popular sentiment. How were the people to be led up to this appreciation? There is a German proverb which says: "What you would have appear in the nation's life you must introduce into the public school." Germany, therefore, introduced tree planting into the public schools throughout the country, and in the hands of enthusiastic teachers the treeless school plains soon found shade and shelter, and the school deserts were made to "rejoice, and blossom as the rose." Lessons on trees and forests were easily enforced under such circumstances, and soon Germany had a people that looked upon her 20,000,000 acres of forest with anxious solicitude, and the public schools became more effectual in forest protection than the national police. Regular "Arbor Days," so called, were not established in Europe so far as we know. Prussia has an income from her forest of $14,000,000. The expenses are $7,500,000. Leaving a net profit of $6,500,000. Saxony, Bavaria, Hanover and other countries pursue a similar forest policy with similar results.

In America, interest in tree planting has developed more recently. About twenty years ago several village societies were formed in New York State, one of their objects being the improvement of streets by the planting of trees; but to Nebraska belongs the honor of originating Arbor Day. About thirteen years ago, at the request of the State Board of Agriculture, the Governor appointed the second Wednesday in April as the day to be devoted to economic tree planting in that State, and it is claimed that 12,000,000 of trees were planted on that day. Every year since, this day has been similarly recognized in Nebraska. Other states soon followed Nebraska's noble example, until now nearly all the Western and several of the New England States have their annual Arbor Days, and most of them celebrate it in conjunction with their public schools. We are not quite certain, but think Indiana was the first state to proclaim a school Arbor Day; but it was soon found that while this celebration was educating the young people in the important lessons touching the beauty and vast utility of trees and forests, it was an important educator in other respects as well, and was rendering school premises not only more beautiful and comfortable, but more healthful, refining and attractive, and actually promoting school attendance.

The plan of planting memorial trees and groves in honor of illustrious persons or friends, and known as the Cincinnati plan, had its origin in 1882, and was introduced by Hon. Mr. Peaslee, Superintendent of Schools. Governor Foster had proclaimed April 27th as Arbor Day for the State. Mr. Peaslee addressed a circular to trustees, superintendents and teachers throughout Ohio requesting them to celebrate the day after the Cincinnati plan. No sight more beautiful, no ceremonies more touching, had ever been witnessed in Cincinnati. The school children were under the charge of Mr. Peaslee. Fifty thousand citizens covered the grassy slopes in the suburbs of the city. Many memorial groves were planted and thousands of trees. This was the first Arbor Day celebration in Ohio. The Cincinnati plan has been largely followed in other States, especially in Virginia and Connecticut. One of the leading journals of England has recommended the Cincinnati plan of tree planting celebrations among the public schools of Great Britain.

Arbor Day was first celebrated in Ontario in 1885, in response to a circular issued by the Minister of Education, requesting the schools throughout the Province to plant trees, shrubs and flowers on their premises upon the 8th of May. Though the circular was not issued till after the middle of April, 30,648 trees were planted and 253 flower beds were made. So gratifying was this result that in 1886 it was provided by law that an Arbor Day shall be annually observed throughout Ontario in connection with her public schools.

In Nova Scotia, provision has for three years existed for planting trees on school grounds.

In New Brunswick the propriety of planting shade and ornamental trees on school grounds was first formally discussed at the Sunbury and Charlotte Teachers' Institutes, in 1883, and resolutions were

passed favoring such improvements. At the next Provincial Institute, held at Fredericton, a resolution was passed commending the subject to the general attention of the teachers. In May, 1885, St. Stephen celebrated the first regular school Arbor Day in New Brunswick, when over 200 trees were planted upon her school grounds, about one thousand citizens being assembled to listen to the programme of exercises and participate in the celebration. Moore's Mills and other places followed the example of St. Stephen during that spring, and at the Provincial Institute held in the June following, resolutions were passed commending the movement, and urging the Board of Education to provide for a school Arbor Day throughout the Province. In September of that year an address upon the subject was delivered at the Carleton County Institute, and published by the Woodstock *Press*. The following spring the Inspector of District No. 6 requested the schools under his supervision, through the local newspapers, to plant trees on the 24th of May. This request was responded to by forty-four schools, and over 1,600 trees were planted on their school grounds, chiefly in Carleton County, and other improvements made. St. Stephen's 1886 Arbor Day was even more successful than was that of 1885. At the Provincial Institute in June, 1886, the Arbor Day resolutions of the preceding year were reaffirmed, and on the 7th day of April, 1887, the Board of Education authorized an annual school Arbor Day for New Brunswick. This was observed last year by the planting of 8,179 trees and shrubs.

I. B. O.

Canterbury, N. B.

For the REVIEW.]

ARBOR DAY.

In our last number we advocated the planting of trees in connection with the schools throughout the country, and sought to show the advantages, which, we believed, would result if our suggestions were carried into effect. The season has now arrived when planting ought to be done, and, while again pressing the general question of arboriculture upon the attention of our readers, we wish at this time to bring to their notice certain matters of detail, which are important to be borne in mind when preparing for and while planting the trees. Sufficient care is not always shown in selecting young trees for planting out. If there is a good nursery near, this is much less likely to be the case, as the nurseryman, who understands his business, knows better than to supply poor, scrubby stock. But in the great majority of localities there are no nurseries, and even when they are to be found, many people cannot well afford to buy from them, so that the native woods have to be resorted to, and there many of the young trees are not such as it would be wise to choose for planting. Some are stunted, more are crooked, and numbers are knotty or have some defect that is apparent on slight inspection. These should be carefully avoided and none but straight, vigorous young saplings chosen. These are always to be found if a little trouble is taken to look for them, and they will repay the extra care by their superior appearance and better growth after re-planting. Some varieties of trees also are much more easily grown than others. The elm, maple, ash and birch, among common forest trees, cost little trouble, and a very slight amount of care suffices to ensure their successful growth. The beech, on the other hand, owing to its root, is much more difficult to deal with. Unless put out by a skilful planter it is very apt to fail, and the writer has noticed that in nearly all the instances of planting beeches, which he has seen, they have not done well. They live on for a year or two and then are very likely to die out or only exist in a sickly sort of way, so that the planter who chooses them bids fair to be disappointed in the results of his labour. Of smaller native trees the rowan is very ornamental and grows well. Such well known trees as the lime, horse-chestnut, acacia and willow are easily grown. The Lombardy poplar is frequently planted out, but it is a poor tree, has a short life, and is not to be recommended. Being a fast grower, it may be temporarily planted between trees of more value but slower growth, and can be removed after a few years, when the latter have reached fair dimensions. Having carefully selected the young trees, the planter must also exercise care in setting them out. Many persons seem to think that trees should be deeply planted. This is a common and serious mistake. The young saplings should be re-planted as nearly as possible to the same depth in the soil that they were in their native woods. If planted deeper their growth will be retarded for years, if not permanently injured. Should the soil to which they are removed be poor, the best way to improve it is to procure some of the virgin soil from the woods and substitute it for the other. Very little would be needed. Manuring to strengthen the soil is not nearly so good. It is well when the trees are put out to place a mulching of horse-dung over the roots, but not so close to the stem as to touch it. This mulching might be two to three inches in depth. It prevents the earth about the roots becoming parched in the hot dry weather, and retains the moisture necessary to the life of the young tree. The earth ought to be firmly pressed down about the roots, so that they may not be loosened by

the wind, and if the tree is supported by being tied to a stake with some material which would not rub the bark, it will become all the more quickly fixed in the soil and will also have a straighter growth. When placed out the trees should be well pruned. Spare the knife and spoil the tree is a perfectly true variation of the old proverb. Many inexperienced planters are terribly afraid of the pruning knife, yet its judicious use is most essential. A tree requires at least a year to become thoroughly rooted in its new place, and all the nutriment it can get is needed to strengthen it in its early stages, and if this nutriment goes to leaves the tree is weakened and frequently dies. The branches should be well trimmed, and if the tree is not intended for timber, the top may be cut off, and in a year or two a luxurious growth of young shoots will take its place and the tree will spread out and have a thicker growth.

A good sized tree for transplanting is one from an inch to an inch and a half in diameter a foot from the ground, though, if care be exercised, those of larger size may be successfully planted. For ornamental purposes they may be placed about thirty feet apart. This may seem a great distance while the trees are young and small, but a few years changes all that and they will be better for having plenty of room.

We have gone into these details, as we think this subject one of much importance, and to ensure success, details of the nature we have mentioned must be attended to. We hope to see the attention of the several Provinces specially directed to this question of arboriculture. It is well within the scope of their duties, and they could, with little trouble, prepare and issue to the teachers short manuals or circulars giving instructions as to the simplest and best means of succeeding in tree-planting. Which Province will take the initiative in introducing the study of arboriculture into its system of education?

A. B. W.

Charlottetown, P. E. I.

For the REVIEW.]

ARBOR DAY MISTAKES.

As Arbor Day is approaching, when teachers, pupils, and many other interested ones are planning to plant trees, shrubs, etc., upon the school grounds throughout the Province, permit me to refer as briefly as possible to some of the mistakes which, in my judgment, were made last year. That mistakes should be made in engaging in an enterprise so new to most of our people, was to be expected, but let them be repeated this year in as few cases as possible. It involves much labor to take up and transplant trees. If the work be done intelligently and patiently, it will in most cases be effectual; if done hurriedly and carelessly, it is almost sure to be lost. One common mistake was

1. In *Selection*. The tree having been in many cases

(*a*) Taken from the forest where it was tall and spindling, with little top and less root, instead of from open fields or pastures, where the tree grows short, with a considerable top and numerous roots and rootlets, affording sufficient vitality to overcome the shock of transplantation.

(*b*) In being too large, sometimes from two to three inches in diameter, requiring more root to insure its growth than is generally taken up with such large trees. A tree from one inch to an inch and a half in diameter is much more likely to live, and, overcoming soon the shock of transplanting, it will sooner become a larger tree than the bigger specimen.

(*c*) In planting short-lived trees, such as poplar, etc. In having been taken from poor soil instead of from good, also from soil very unlike that of the school ground. The tree out of good ground is more likely to grow, even though the place where it is set is poor. It has more rootlets to draw nourishment from the soil.

2. In *Removal*.

(*a*) In cutting off roots too near the trunk, instead of cutting a circle from four to five feet in diameter.

(*b*) In forcibly pulling the tree out and breaking and tearing the roots, instead of taking time to dig carefully, cutting off the main roots here and there, and thus taking up with the tree a good portion of earth and leaf mould as well as rootlets.

(*c*) In having taken the trees from very rocky ground where mangling could not be avoided, instead of finding a place as free as possible from such hindrances.

(*d*) In having taken up the trees on the morning of Arbor Day, or the night before, and leaving them exposed till the following afternoon, thus drying the roots of the trees and insuring their death, instead of removing the trees at once to the excavations already prepared for them.

3. In *Planting*. (*a*) In digging holes too low and setting the tree too deep. If soil is shallow with a sub-soil of clay, a shallow excavation is best, preventing as it does the accumulation of water beneath the roots. If soil is deep, a deep hole is better, but the tree must not be set more than an inch or two deeper than it was originally; the roots must not be placed beyond the action of the air or heat. (*b*) In leaving vacant spaces about the roots, instead of carefully and

patiently filling under the roots with fine surface soil and packing it carefully with the hand when necessary. (*c*) In filling in about the roots with poor under soil instead of rich loam, hauled, if necessary, for the purpose. On many school grounds the soil is so poor as to warrant the death of almost any tree unless good soil is added. (*d*) In not trimming roots and top instead of cutting off with a sharp knife and saw all mangled roots, and, in the case of nearly all hardwood trees, a large portion of the branches, to balance a diminished root.

4. *In after care,* (*a*) In not multching, instead of placing round the roots (after tree was planted) some old straw or litter to keep the soil moist. Probably more trees die from this neglect than from any other cause. (*b*) In neglecting to water the tree during drought. (*c*) In neglecting to enclose the tree with stakes and slats where the premises were not fenced.

5. Probably some mistakes were made in the arrangement of the trees, they being in some cases too near each other. It would be well for each teacher to study out some good definite design before planting day arrives, consulting his trustees, as well as his older pupils, thus securing their interest and co-operation.

I. B. OAKES.

IN planting trees a proper proportion of pines and other evergreens should be chosen, not only for the shade and variety of form and foliage, but for their health-giving qualities. The pine with its constant exhalation of turpentine vapor and its never-failing foliage, ought to be planted in proper proportions about schools and dwelling houses, because it is beneficial to persons of weak lungs and its influence is unfavorable to the products of germ life. The same is true in a lesser degree of other evergreen trees. Moreover, they afford a pleasant shade in summer and in winter; and, mingled with other trees, they give a charming effect.

IN reply to some inquiries regarding the distribution of certain species of violet in Nova Scotia, Prof. Lawson, of Dalhousie College, sends the following interesting notes, which were received after that part of the REVIEW containing the article on botany had gone to press.

"*Viola lanceolata* is common about Halifax, in bogs, growing on infusorial mud, particularly, but also in wet fields. I have also seen it in Queens, and no doubt it is found in many other parts of the Province. It was collected at Halifax by Menzies, before the close of the last century—the same Menzies who accompanied Vancouver's voyage.

"*Viola primulæfolia* grows in only one spot, near Three Mile Church. The locality is growing into a suburban village of Halifax, known as Fairview.

"*Viola Canadensis* is scarce. I gathered it once at Newport. . . . It grows also about Windsor.

"*Viola pubescens* is quite rare with us. Has been found at Windsor and one or two other places. I once picked up a specimen on the railway platform at Bedford, but could not ascertain whence it came.

"The common, white, sweet-scented violet, *V. blanda,* is very abundant—our commonest violet by far. In Aiton's Hortus Kewensis it is credited as having been introduced to English gardens by the Duke of Kent. It was probably sent from Prince's Lodge, Bedford Basin.

N. B. SUMMER SCHOOL OF SCIENCE.

A Summer School of Natural Science will be opened in St. John on Tuesday, 3rd of July, 1888, and continue until Friday, the 13th July. This arrangement is on the condition that at least twenty-five students enroll themselves as members of the school before the 10th of June next.

A meeting for organization will be held at three o'clock p. m., on Tuesday, July 3rd, in the lecture-room of the N. B. Natural History Society, whose rooms and museum will be placed at the disposal of the members of the school. At the meeting for organization steps will be taken to make the N. B. Summer School a permanent institution.

The excellent collections in the museum of the Society, the great variety in the natural history resources and scenery about St. John, with its bracing atmosphere, should make this an opportunity of combining instruction in natural science with pleasant recreation. Laboratory work and lectures will alternate with excursions to places of interest about the City. The fee for membership will be $2.00. Board may be obtained at from $3 to $4 a week, and arrangements will be to make all excursion trips as cheap as possible, including one fare to and from St. John to students from a distance.

The work will be of the most elementary character, specially helpful to teachers in giving instruction in the natural history subjects laid down in the course of instruction for the schools of the Province. The subjects treated, with the names of the lecturers in each, are as follows:

GEOLOGY AND MINERALOGY—Prof. L. W. Bailey, Ph. D., and G. F. Matthew, M. A.
BOTANY—G. U. Hay, Ph. B.
ZOOLOGY—John Brittain, Philip Cox, jr., B. A., and Wm. M. McLean, A.B.
CHEMISTRY—W. F. Best.
ASTRONOMY—H. C. Creed, M. A.

A full circular with outline of work, etc., will be prepared later. Those who intend to avail themselves of the privileges of the school, may send their names to Wm. J. Wilson, St. John, Secretary to Committee, or to any of the members named below:

Committee of Arrangements—G. U. Hay, Philip Cox, jr., John Brittain, H. C. Creed; W. J. Wilson, Secretary to Committee.

EDUCATIONAL OPINION.

The programme of studies for the whole school in most cases is adapted to the needs of the few who are preparing to enter the professions. This is an abuse of our educational advantages. Many of the more enlightened of our teachers see and regret the tendency, but are powerless to prevent it. This kind of instruction is in general demand and they find themselves obliged to supply it.... In my intercourse with our teachers and trustees I have endeavored to give a more practical turn to the work of our public schools. Only one in about 200 of our young people ever go beyond the common district school, and less than one in every 1,000 enter the universities. The education given in the common schools, therefore, should train the young principally for the duties of practical life. While the most favorable opportunity should be given to well-directed ambition, the schools must be conducted so as to do the greatest good to the greatest number.—*Supt. Montgomery, P. E. I.*

Instruction in elementary science needs more study and observation on the part of the teachers, and more illustration in the teaching. I trust our teachers generally will make good use of Dr. Bailey's new text-book, and the Summer School of Science, as well as the science lessons in the EDUCATIONAL REVIEW. It is also desirable that a deeper interest be taken in temperance instruction.—*Inspector I. B. Oakes.*

The general work done in all the schools as a whole, during the year, was very satisfactory, and I am satisfied that very substantial and lasting progress is yearly being made in the schools.—*Inspector Geo. Smith.*

While there is very little change in the scholastic acquirements of teachers, and even a diminution in their pay, I can honestly say that the character of their work is improving. Their anxiety to gain knowledge and improved methods of teaching, their enthusiasm in the school-room, is not to be checked by an unappreciative public. While their salaries are diminishing, they are subscribing for educational papers, attending teachers' associations, the normal school; doing everything that lies in their power to make them better teachers. They are not working merely for their salaries, but the majority are discharging what they consider a sacred trust. Not all, for there are those who scrimp their work in every walk of life, and there are teachers who say good-bye at the end of the term with their highest aspirations satisfied if they have taught the full number of days. —*Inspector E. J. Lay.*

The School of Science which held its first session at Wolfville during the summer holidays was originated by the Normal School Alumni Association, and so it may be properly regarded as one of the beneficent results of normal school influence on educational progress in the province. The school was regarded by all who availed themselves of its advantages, or who studied its work, as a pronounced success. It certainly more than fulfilled the most sanguine expectations of its promoters, and it promises to give a decided impetus to the study of natural science on the part of our teachers.

I desire also in this place to express, on behalf of the Normal School, a very high appreciation of our new educational journal, "THE EDUCATIONAL REVIEW," which has, during the year, made so auspicious and promising a beginning. I trust that it will receive that support from the teachers of Nova Scotia, and especially from the graduates of the Normal School, which its merits deserve.—*John B. Calkin, Principal Normal School, in N. S. School Report.*

There are at present too many third-class teachers. There would not be so much objection to this if there was a general desire among them to obtain an advance of class. The schools suffer when unprogressive teachers are employed of any class. The supply of second-class male and female teachers is barely up to the demand, while there are more third-class teachers than can secure situations.—*Inspector W. S. Carter.*

Cheap elementary works of an approved character, and embracing as much variety and accuracy of information as possible in a small compass, would, I humbly conceive, be every way best adapted for our schools in their present state.—*John Macneill, Charlottetown.*

From my "Notes of Inspection," however, it will be observed that the number of schools in which these ("Lessons on Nature") were given is much greater than in any previous year, though there are still too many schools in which they are neglected. Teachers who do not possess the requisite knowledge of the subject-matter of such lessons, or of the manner of imparting instruction therein, may readily qualify themselves by the study of the text-books recommended by the Council of Public Instruction. Valuable assistance may also be obtained from the specimen lessons given from time to time in the EDUCATIONAL REVIEW, which should be in the hands of all our progressive teachers.—*Inspector R. McLellan.*

SCHOOL AND COLLEGE.

The Saint John Business College was established in 1867, and is therefore now in its 21st year. The Principal, Mr. S. Kerr, has had seventeen years of business college experience, and the fact that the last winter session was the most successful in the history of the institution, may be accepted as evidence that Mr. Kerr knows how to maintain the popularity, which, from its establishment, the college has deservedly enjoyed. New Brunswickers, being abundantly endowed with the spirit of enterprise, are to be found almost everywhere, and a very common report from the successful ones abroad is the declaration that their success may be largely attributed to the training received at the Saint John Business College. Mr. Kerr, in his advertisement in this number of the REVIEW, calls attention to the advantages enjoyed by his college on account of the cool summer weather of Saint John.

List of graduates of the University of Dalhousie College at convocation, April 26th, 1888:

ARTS, M. A.—H. H. K. Fitzpatrick, Scotstown; Robert McD. Langille, River John.

B. A.—Daniel McD. Clarke, West River; Willard Hill Fulton, Halifax; David McK. Grant, Riverton; George Miller Johnston, Upper Stewiacke; William McDonald, Pictou; Henry M. MacKay, Plainfield; W. J. McKenzie, West Bay; S. J. McLellan, Sydney; Ambrose W. McLeod, Dunstaffield, P. E. I.; John A. Matheson, L'Ardoise; Alexander McG. Morrison, Dartmouth; Thomas R. Robertson, Annapolis; David Soloan, Windsor; John S. Sutherland, St. James, New Brunswick.

LAW, LL. B.—Ernest Howard Armstrong, John Roy Campbell, jr., Harry Treadway Jones, Adams Archibald McKay, Edgar Allison Magee, Charles Alexander McCready, Hector McInnes, Daniel McLennan, Auley Morrison, Charles Ernest Gregory.

PERSONAL NOTES.

Mr. W. C. Murray, B. A., the Gilchrist scholar for 1887, has won a medal and a bursary of £25 at the University of Edinburgh. He holds this bursary for two years.

One of the ablest students in Dalhousie College, Victor G. Frazee, also an editor of the Dalhousie "Gazette," wrote all his examination papers in the reformed spelling, according to the twenty-four rules recommended jointly by the Philological Societies of Great Britain and the United States. The classical professor was so far behind the Philologists of England and America in his ideas upon the subject as to demur.

G. R. Parkin, Esq., Principal of the Collegiate School, Fredericton, will spend the summer in England. He will leave early in June, and will probably be absent until October. Pleasant voyage!

Mr. A. W. Duff, of Portland, has been graduated with honors from Edinburgh University, with the degree of M. A. Mr. Duff was first in mathematics.

Inspector E. J. Lay, of Amherst, N. S., found a potato bug captured in the leaf of the Pitcher Plant (*Sarracenia purpurea*) during the first week of April last.

The Board of Governors have lately appointed to vacancies, caused by the death of members, Mr. Adam Burns, one of Halifax's most successful, wealthy and public spirited merchants, and Mr. A. H. McKay, the Principal of Pictou Academy, one of Dalhousie's most distinguished sons, and an educationist whose reputation is already continental.—*Dalhousie College Gazette.*

QUESTION DEPARTMENT.

Questions and Answers.

A correspondent asks us to re-publish the articles on "Spelling Reform" that have appeared in the "Dalhousie Gazette." We regret demands on our space are so great that we cannot find room for them.

H.—Please inform me where the "Century" is printed? By the Century Company, Union Square, New York.

A. H. M.—Where can I get information on spelling reform?

1. Write to "Library Bureau, 32 Hawley Street, Boston, Mass., U.S.A. 2. Write to "U. S. Bureau of Education, Washington, D. C." and get circular of information, No. 7, 1880, "The Spelling Reform," 36 pages, *free*. 3. Get the quarterly "Spelling," a magazine devoted to the simplification of English orthography, the official organ of the Spelling Reform Association, "Library Bureau, 32 Hawley Street, Boston, Mass., $1.00 per annum.

M. B. H.—Is it proper to use the reformed spelling in one's correspondence; and is it necessary for one to intimate in any way that it is being used?

1. It is proper. The leading scholars in England and America are in favor of reform. 2. It is better to indicate, at present, that you are spelling according to some recognized system. Rubber stamps, marked "Reformed Spelling," (spelt according to the twenty-four rules of the Philological Societies of England and America, etc.), are used by some to stamp their correspondence.

SUBSCRIBER.—A glass tube is depressed in A, a vessel filled with water; and next in B, a vessel filled with mercury. In A the water in the tube rises above the level of the water in the vessel. In B the mercury in the tube is below the level in the vessel. Explain fully causes of phenomena.

A full explanation would require considerable space and mathematical analysis. A simple explanation may be given as follows: 1. The molecules of water attract each other as is shown by the formation of a drop. So do the molecules of mercury attract each other. 2. The surfaces of solids attract some liquid molecules, and repel others. If a drop of water be placed on clean glass it spreads over the surface, due to the attraction between the molecules forming the surface of the glass and the molecules of water. If a drop of mercury be put on the same surface it will not spread; on the other hand it will be repelled from the surface of the glass, so that its edges will tend to rise up in the form of a spherical globule. The causes of the attraction and repulsion exist in the constitution or nature of the different molecules. 3. In the experiment given, the water within the tube is attracted by the surface of the glass, and tends to spread upwards. The upper spreading edge by molecular attraction draws up a lower stratum of water after it above the ordinary level. When the bore of the tube is small, the approximation of the glass surface allows its surface attraction to act upon a proportionally less weight of liquid, so that the increase in height of the column varies inversely as the diameter of the bore. 4. As the glass surface repels mercury, the column of mercury within the tube will be lowered according to the same law. The narrower the bore the greater the depression.

E. J. L.—Your question last fall about the apple worm is answered in full in "Ferndale School"—*The Codling Moth*—of this number.

BOOK REVIEWS.

THE CONCISE IMPERIAL DICTIONARY of the English Language, by Chas. Annandale, M.A., LL.D. Toronto, J. E. Bryant & Co., Publishers. A copy of this dictionary has been received from Messrs. Bryant, the publishers in Canada. It is based on the Imperial Dictionary, and its compact size and arrangement, small though distinct type, complete vocabulary, and accuracy of definition and pronunciation, make it an admirable volume for ready reference. It condenses a great amount of matter into a moderate compass, but this condensation is not gained at the sacrifice of clearness or fulness of definition. Each page—and there are 800 in the book—is divided into three columns, forming a solid phalanx of clear, comprehensive definitions. A method is adopted of grouping a primary word and its derivatives into one paragraph, and as each word is printed in full-face type there is no loss of time in looking for the desired word. Opening the book at random we hit upon the word "Sea." After giving the derivation, and all possible meanings and references, then come certain phrases in which the word is used, as *at full sea*, etc., followed by no less than 105 compounds, such as *sea-sick*, *sea-tangle*, etc., the whole taking up about two columns and a half, and leaving nothing to be desired in the way of completeness. It is invaluable to the business man who needs conciseness, and on occasions, fulness; and its cheapness—$4.50—puts it within the reach of all.

AN ELEMENTARY GEOGRAPHY OF THE BRITISH ISLES, by Archibald Geikie, LL.D., F.R.S., Director-General of the Geological Survey of the United Kingdom. London: MacMillan & Co., New York. This small volume of 127 pages contains matter that is of great interest to the geographical student. The name of its author is a sufficient guarantee of its value. Those teachers who have read and made use of Geikie's Physical Geography know well with what an interest this distinguished author invests his subject.

ARITHMETIC FOR BEGINNERS, by Rev. J. B. Lock, M. A., Caius College, Cambridge. London: MacMillan & Co., and New York, 1888.

This is a neat little book of 200 pages, filled with a well graded selection of examples. The definitions and explanatory portions are characterized by clearness and conciseness. Interest, stocks and exchange are very nicely treated. Instead of the old rules of proportion we find the unitary method used in the solution of "proportion and compound proportion" problems. It is an English commercial elementary arithmetic, modern to Canadian eyes in every respect, except in the universal prevalence of £ *s d*. Teachers in our common schools will find it to contain a capital collection of well graded exercises for class drills in arithmetic.

COMPANION TO THE WEEKLY PROBLEM PAPERS. Intended for the use of students preparing for mathematical scholarships, and for the junior members of the Universities who are reading for mathematical honors. By the Rev. John J. Milne, M. A. London: MacMillan & Co., and New York, 1888.

This is a handsome volume of some 340 pages, got up in the usual good style of this famous publishing house. So many apparently original demonstrations and presentations of mathematical truths and methods scattered over an extensive and varied field are so concisely arranged in the treatise that it will not only be invaluable to the mathematical student and teacher who wishes to keep abreast with the progress of mathematical teaching, but a great source of delight. Its range will be best shown by a summary of its contents. 1. Theory of maximum and minimum, treated, first, algebraically; second, geometrically, to page 47. 2. Theory of envelopes, treated in like manner, to page 70. 3. "Centroid" and "force" applied to geometry, to page 78 4. Biangular co-ordinates. 5. Recent geometry, discussing antiparallels, isogonals, inverse points, the Brocard points and Brocard ellipse, the Lemoine point and triplicate ratio circle, the Brocard circle and first Brocard triangle, the Tucker circles, the Cosine and Taylor circles,

Cosymmedian and co-Brocardial triangles, etc., to page 185. 6. Feuerbach's theorem, page 192. 7. Theory of inversion, and pedals, page 205. 8. Geometrical and mechanical constructions, page 212. 9. Theory of elimination, page 233. 10. Summation of series, page 233. 11. Binomial series, to page 240. 12. Algebraical and trigonometrical identities, to page 247. 13. Miscellaneous articles, to page 261. 14. Lengths of tangents and normals to a conic. 15. Some solutions. 16. Mathematical scholarship papers.

COMMON SCHOOL LAW. A digest of the provisions of common and statute law as to the relations of the teacher to the pupil, the parent, and the district, with five hundred references to legal decisions in twenty-eight different States. By C. W. Bardeen, Syracuse, New York, 1888.

This is a small volume of 120 pages—a regular *multum in parvo*. We know of no work in which the teacher can get the common law of the common school so concisely put up. We quote one paragraph, chap. ix. sec. 2. "The Schoolmaster's Castle."—The schoolhouse is the schoolmaster's castle. Upon this point the following forcible statement is fully warranted:

"This old maxim of English law (5 Rep. 92) is as applicable to the schoolmaster as to any other person who is in the lawful possession of a house. It is true that the school officers, as such, have certain rights in the schoolhouse; but the law will not allow even them to interfere with the teacher while he keeps strictly within the line of duty. Having been legally put in possession, he can hold it for the purposes and time agreed upon; and no parent, not even the Governor of the State nor the President of the United States, has any right to enter it and disturb him in the lawful performance of his duties. If persons do so enter, he should order them out; and if they do not go, on being requested to do so, he may use such force as may be necessary to eject them. And if he finds that he is unable to put them out himself, he may call on others to assist him; and if no more force is employed than is actually necessary to remove the intruder, the law will justify the teacher's act and the acts of those who assisted him." (Here follow references, "The Lawyer in the Schoolroom, 1871," page 120.)

SEA-SIDE AND WAY-SIDE is the first of a series of Nature Readers by Julia McNair Wright, and published by D. C. Heath & Co., Boston. It is intended for the use of beginners in reading. There is a delightful freshness and interest about each topic presented which cannot fail to excite the curiosity and attention of a child. To judge from the excellence of the first of the series, they would give abundant hints to parents, teachers of primary schools and kindergartners, for the instruction of young children.

BOOKS RECEIVED.

ARMY PRELIMINARY EXAMINATIONS, 1882–1887. London: MacMillan & Co., and New York.

WORDSWORTH'S PRELUDE, with notes, by A. J. George, A. M. Published by D. C. Heath & Co., Boston.

PRACTICAL LESSONS in the use of English, Books I. and II., by Mary F. Hyde. D. C. Heath & Co., publishers.

CARDINAL WOLSEY, No. 2 of the "Twelve English Statesmen" series. London; MacMillan & Co, and New York.

EXCHANGES.

The American Geologist for April contains many valuable articles, among which "Darwin and Geology," by Professor Claypole, is especially interesting. This fine monthly is published at $3 per year. One of the seven editors and proprietors is Professor Edward W. Claypole, Butchel College, Akron, Ohio, U. S. A.... *The Microscope* is an illustrated monthly costing only $1, and published at 25 Washington Avenue, Detroit, Mich, U. S. A. For the American microscopist it is by all odds the best journal for the money published anywhere.... *Science*, a weekly journal published at 47 Lafayette Place, New York, at $3.50 per annum, is indispensable to every man wishing to keep abreast of the times. It devotes considerable attention to the record of Canadian scientific work of the Natural History Survey. .... *The Argosy*, of Mount Allison, is one of the most interesting of college exchanges.... *The Colchester Sun* shows commendable enterprise in occasionally giving a short sketch and portrait of leading local men. This time it is their worthy new Mayor of Truro, Richard Craig, Esq.... *The Toronto Educational Journal* opens a scientific department under the able charge of Dr. Fessenden. This is a good sign of the times.... *Wide Awake*, for May, Messrs. D. Lothrop & Co, publishers, Boston, is a beautiful number. One feels that he has his money's worth in the illustrations of the first two pages—"Queen Louise and her Sons," and the poem and picture of the Spring Anemone.... *Popular Science Monthly* for May, published by D. Appleton & Co., New York, has many excellent articles, among which are "The Moral Influence of Climate," "The American Robin and its Congeners," "The Future of the American Indian," besides its usual full notes on literary, educational, and scientific matters.... *The Century* for May opens with the promised article on "Siberia and the Exile System," by George Kennan, which promises to be of such great interest to the student and general reader. Its other articles are, as usual, excellent, especially those on educational topics.... *St. Nicholas* for May, published by the Century Company, New York, has an interesting table of contents and illustrations. Its sketch of Girard College, "Ginseng-hunting," by John Burroughs, with other spirited and instructive articles, make up a superb number.... *The Illustrated London News* for May 5th contains a portrait of Matthew Arnold. Its sketches of scenery in lower California, in the same number, are very picturesque. The American edition of this world renowned periodical is published weekly in New York at the low price of $4 a year.... *The Puzzler* is a unique little magazine and grows more and more interesting with each number. Published by N. D. C. Hodges, New York.... *The Swiss Cross* for May is bright and interesting, and full of just such material as the youthful worker in science requires. Published by the Science Publishing Company, New York....The *Bookmart* for May, published by the Bookmart Publishing Company, Pittsburg, has been received. It has an interesting table of contents.... *The Scientific American*, published by Munn & Co., New York, in its issue of May 5th illustrates a simple and practical method for teaching geography.... *Forest and Garden*, published in New York, increases in interest with every number.