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# JOURNAL OF EDUCATION

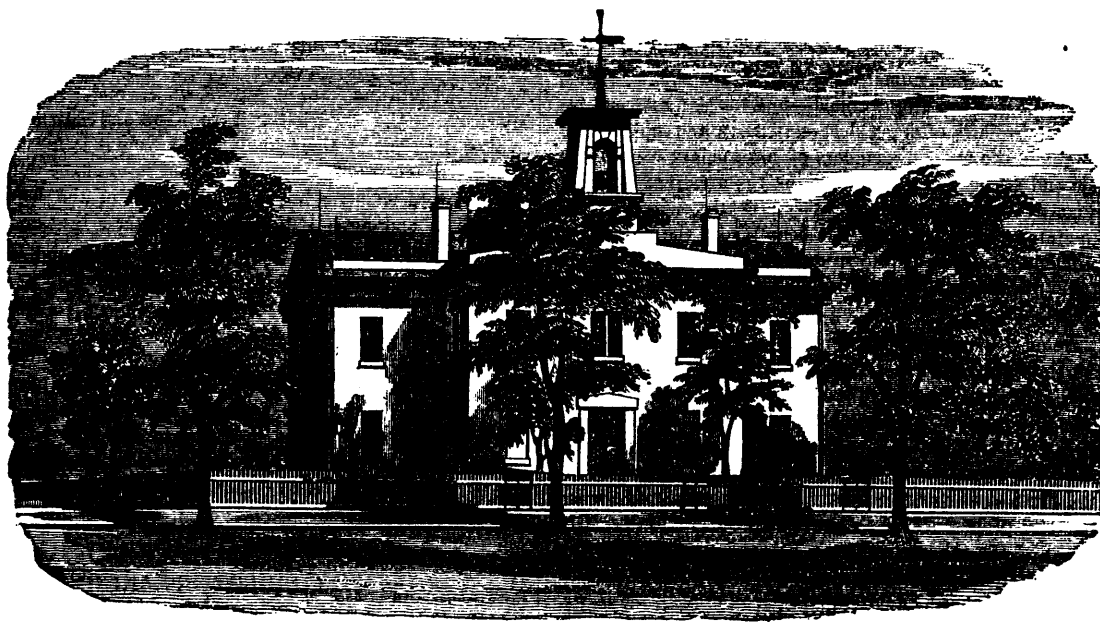
FOR

## Upper Canada.

VOL. II.

TORONTO, JUNE, 1849.

No. 6.



(Fig. 1.)

### SPECIMEN FRONT VIEW OF ONE OF THE SIX GRAMMAR SCHOOL-HOUSES OF THE CITY OF PROVIDENCE, RHODE ISLAND.

In addition to the Primary and High Schools of Providence, Rhode Island,—one of the smallest of the New England States,—there are also in operation in that City six Grammar Schools—of the same class and constructed on the same plan as the above—the Front View and entire Plans of which we give in this number of the *Journal of Education*.

The building above represented is 70 feet long by 40 feet wide; with a front projection, 28 feet long by 14 feet wide. The six Grammar Schools referred to are each erected on very large lots, varying from 150 to 200 feet long, and from 150 to 200 feet wide. With one exception, they are all on corner lots, and all have large open spaces around them. These, and all the other public School-houses in the City, are protected by small lightening rods (as seen in the engraving), and each building is furnished with a school bell which can be heard in the remotest part of the section.

As seen in the engraving, each of the Grammar School-houses is surrounded by umbrageous elm, maple, and lime trees—thus giving an air of shade and coolness to the otherwise exposed situa-

tion of the building in summer, and relieving the bleakness of the general aspect of the comparatively isolated School-house lot in winter. It is greatly to be regretted that in little matters of this kind, involving so much the comfort, cheerfulness and happiness of both Pupils and Teacher in the naturally heated atmosphere of a School-room, more attention is not paid to the interests of health. We would earnestly commend the matter to the attention of School Trustees and Building Committees.

We would just remark, *en passant*, that in the year 1848 the population of the City of Providence was but 31,753, while that of the City of Toronto was 23,503; yet, in addition also to her Colleges and private Academies, can Toronto boast either of her Primary, High, or Grammar Schools, in proportion to her population, her importance, her advantages, or her wealth, as compared with those of Providence, on the once "wild New England shore?"

A description of the interior arrangements and plans of the several floors of these buildings, with a transverse section of the Grammar School-house will be found on pages 84 and 85.

## Miscellaneous.

### DIRECT ACTION OF THE PEOPLE IN AID OF COMMON SCHOOLS.

BY S. S. RANDALL, ESQ.

The importance of a *direct and frequent* appeal to the people in behalf of the interests of education may, perhaps, be best illustrated by reference to the example afforded by the experience of the State of Connecticut. Next to Massachusetts, the "the land of steady habits" was the earliest to appreciate and to secure the blessings of an organized system of Common School instruction. In process of time an ample public fund was accumulated and placed in the coffers of the State, from whence the fertilizing streams of a wise, and well-directed beneficence were diffused through every neighbourhood; and up to comparatively a recent period, she contested gallantly with Massachusetts the palm of excellence in this inviting field of competition. Gradually, however, and by degrees, her exertions in behalf of elementary education were relaxed—one after another of her numerous and hitherto well-sustained schools drooped, languished and declined—and for many successive years the strongest efforts of her ablest statesmen and philanthropists to re-ignite the expiring embers of her ancient watch-fires of knowledge and virtue were paralyzed by the apparent lethargy and indifference of the public mind. More recently, however, we are happy to state, a vigorous effort has been made, the success of which is confidently anticipated, to re-organize a system of public instruction, and once more to place this noble State on the eminence she so long occupied in the field of elementary education.

To us, it seems not difficult to assign the proximate cause of the apathy which thus prostrated the energies and relaxed the exertions of the citizens of Connecticut in this, their once cherished department of public enterprise. The habit of *relying upon their ample school fund*—a fund long since accumulated, and early set apart for this specific purpose—and to which few, perhaps, of the existing generation, had in any degree contributed—seemed to dispense with the necessity of personal exertion and individual interest in the management of the schools. These institutions were known to be open to all, virtually, "without money and without price." They were maintained, not by annual taxation, as in Massachusetts, but by a *State fund*, annually brought, without direct co-operation on their part, to their very doors. With or without their presence or supervision, this fund was expended in the employment of teachers; and wherever these teachers were competent to afford that kind and degree of education which the varying tastes of the parents required, they were encouraged and the schools sustained; otherwise their children were withdrawn and sent to select or private schools, while the Common School was left to children of indigent parents, who could not afford to send to more ambitious establishments; and who, however great might be the interest they felt in the prosperity of the District School, possessed none of those means of influence which could augment its usefulness or add to its efficiency.

The absence, then, of that *direct and personal interest* in the institutions for elementary instruction which is afforded by *periodical contributions to their support*, on the part of the citizens generally, and which, as has been seen, so essentially invigorates the working of the Free School system of Massachusetts, is directly calculated to lead, by a sure and intelligible process, to indifference, apathy, neglect and ultimate disorganization. A public fund, however ample and munificent, derived from *the coffers of the State, exclusively*, and to which the citizens are not *directly called upon to contribute*, is not, of itself, sufficient, even when aided by the most unexceptionable organization, to awaken and concentrate that *personal interest* in the efficient administration of a system of public instruction which is indispensable to its success.

### SPELLING.

The best way of spelling by word of mouth which we have ever known, is for the teacher to put out a word to a class, and then wait just long enough for each scholar to spell it mentally and then name a particular scholar to spell it orally. And the utility of this plan increases just in proportion to the number belonging to

the class. It fixes the attention of every scholar, for not one of them knows but he shall be called upon to spell the word. It forbids all wandering, and betrays it if committed. If the class consist of twenty, twenty minds are at work, the moment the word is uttered by the teacher. In the ordinary way of putting out words to a class in rotation, if the class consists of twenty, as soon as one scholar has spelled a word in his turn, he knows that twenty others have to spell before his turn comes again; and away goes his mind, skating, bird's nesting, or playing tops or marbles, until, "in the course of human events," he perceives that another word is coming to him. In the mode first described, each scholar attempts in his mind, the spelling of each word: in the latter, each scholar seldom does more than spell one word in twenty. Compared with the latter process, the former condenses the labour of twenty days into one. Spelling by rotation ought never to be practiced except, perhaps, in the smallest classes of the very youngest children.

Every word, as it is put out to a scholar, should be pronounced precisely as it is uttered by a good reader or speaker, with the same, but with no more slowness or distinctness of utterance. There is a pleasant electrical experiment, where a conducting wire is shaped into the form of letters, which make some word, and on discharging the electricity, it runs up and down the letters and makes each one of them luminous. Now it is not the voice of the teacher in putting out the words, that is to shape out all the letters of the word visibly; but it is the mind of the learner that is to crinkle up and down and make each letter bright and vivid.

The mode of spelling by writing the words put out on slates or paper, has been so often described, that there can scarcely be a teacher in the State unacquainted with it. We make but a single remark as to the mode of examining the words after they have been written. When a list of sufficient length has been written, all the slates or papers may be left with the teacher for his inspection; or he may take one slate or paper from the right or left, and then let each scholar pass his list to his right or left hand fellow. After this is done, let the words be read or rather spelled in order as they are written, and let each deviation from the true orthography be marked for correction.—*Mass. Com. School Journal.*

### CORRECT SPEAKING.

We advise all young people to acquire in early life the habit of using good language, both in speaking and writing, and to abandon as early as possible the use of slang words and phrases. The longer they live the more difficult the acquisition of such language will be; and if the golden age of youth—the proper season for the acquisition of language be passed in its abuse, the unfortunate victim of neglected education is very probably doomed to talk slang for life. Money is not necessary to procure this education. Every man has it in his power. He has merely to use the language he reads instead of the slang which he hears—to form his taste from the best speakers, writers and poets of the country—to treasure up choice phrases in his memory, and habituate himself to their use—avoiding at the same time that pedantic precision and bombast which bespeaks rather the weakness of a vain ambition than the polish of an educated mind. There is no man, however low in rank, who may not materially benefit his financial condition by following this advice, and cultivating at the same time such morals and manners as correspond in character with good words.—*Ex.*

### TEACHING BY EXAMPLE.

The teacher must exhibit in himself all that he wishes to see in his pupils: There is a mighty power in example. All feel it—but children especially. They look up to the teacher as a superior being, and consequently find themselves imitating him. He must, therefore, exhibit an example of self-government, if he expects them to govern themselves—of conscientiousness, if he expects them to be conscientious—of order, if he expects them to maintain it—of punctuality, if he would have them punctual—and of simplicity and truth, if he would have them simple-hearted and truthful. He must, in short, be before them, always, what he would have them be in the school and in the world. There will be a greater power in this than in all the rules and precepts he can lay down, if they are contradicted by his own spirit and conduct; for

the children will not believe a word of his teachings, if his life does not correspond with them. The Saviour's power lay chiefly in his spotless example. He was, himself, a constant illustration of his own teachings. Even Pilate was constrained to say, "I find no fault in him." Without this, his teachings would have been powerless. What a power there was in his *presence*! It was his pure spirit that shone out—that surrounded him as with a halo. How the multitude hung upon his lips! It was because they were unfeigned lips. No guile was found in his mouth, or in his actions. He was kind, even in his rebukes—a sympathising, affectionate friend—commending himself, always and everywhere, to the confidence and affection of all.

Such should be the teacher. The confidence and affection thus inspired will not only enable him to *govern* his school, but will give him a power over the *intellects* of his students that no other stimulus can exert. Do you wish to *wake up mind*? Make your pupils love you. It will give to the other needful appliances for stimulating intellect, a vastly augmented power. The parents will not find it necessary to whip their children to make them go to school, nor you to make them learn, for they will rather be whipped than not go to school, and not learn what you thus make them love to learn.

### MEMORY.

It is strange—perhaps the strangest of all the mind's intricacies—the sudden, the instantaneous manner, in which memory, by a single signal, casts wide the doors of one of those dark storehouses in which long passed events have been shut up for years. That signal, be it a look, a tone, an order, a single sentence, is the cabalistic word of the Arabian tale; at the potent magic of which, the door of the cave of the robber, Forgetfulness, is cast suddenly wide, and all the treasures that he had concealed are displayed. Upon the memory of the traveller rushed up the visions of his youthful days; the sports of boyhood, the transient cares, the quarrels soon forgotten, the pains which passed away like summer clouds; the pure sweet joys of youth, and innocence, and ignorance of ill, that never return when once passed away.—*F. R. D.*

### INFLUENCE OF SINGING ON THE HEALTH OF CHILDREN.

One of the prejudices most obstinately maintained against teaching children to sing arises from an opinion frequently broached that singing, if practised at a tender age, may have a baneful influence on the health, and occasion pulmonary affections. It is not long since this idea prevailed in Germany also; but the most minute investigations, made by Governments as well as parents, have proved it to be quite erroneous. From the many thousand instances of contrary results, the German people have at last learnt the utter fallacy of this notion, and have not only ceased to dread singing as being injurious to health, but go so far as to consider it one of the most efficacious means, not only for refining the ear, for developing the voice, but also for giving strength and vigour to all the physical organs it calls into action. Nothing is better calculated than the practice of singing to produce the power of free and lengthened respiration. In proportion as matter is soft and plastic, it receives impressions the more readily and indelibly. The human body is necessarily subject to this physical law; and its mysterious union with the living principle, and with spirit, must contribute to increase rather than diminish the effect of that law. Childhood is the fittest period to receive to its fullest extent all the advantages resulting from this branch of instruction. All the organs of the voice are then soft and flexible, and susceptible of the slightest impression. The lungs expand with unobstructed ease; the muscles and nerves connected with the throat and chest yield readily to the action of respiration; the ear receives and conveys sound with facility, and ideas communicated at that early epoch of life are not easily effaced. On the whole, then, we are convinced that singing, or, as it may be termed, the art of extending and managing breath, is one of the best preventives of, and surest remedies for general weakness of the chest; and that its use, provided always it be proportioned to the other physical powers of the singer, is calculated to exert a most favourable influence on delicate constitutions, to impart vigour to the organs connected with the lungs, and thus to conduce to a healthy state of those

important functions of the body. Those who assert that children who learned to sing early have lost their voices, do not take into account the thousand accidents and changes to which their constitution, by our effeminate training, may be subjected: disease of any kind, violent colds, and whatever else, may have weakened the chest and destroyed the former better quality of the voice. At that period of life when the voice undergoes a change, boys lose theirs altogether; the notes of a higher pitch disappear one after another, till, by degrees, a new one presents itself upon a lower octave of the scale, in the form of a tenor or a bass. Often an excellent treble is, in the space of a few months or a few weeks, replaced by a bass of the roughest kind. Although the female voice does not undergo such a remarkable transformation, it nevertheless changes its whole character; a low voice often becomes a high one, and a high one descends and becomes a contralto; a good voice changes into an indifferent one, and *vice versa*. This depends entirely upon the development of the bodily frame and the state of health, so that no one can say, with certainty, what the voice of a child will be at a more mature age. The loss of voice is, therefore, unjustly attributed to early singing, unless injudiciously chosen exercises, or too high notes, have occasioned efforts beyond the power of the voice and chest. Besides, every one knows that children, playing in the open air, often exercise their vocal powers more in one hour, by violent exclamations, than a judicious teacher would ask them to do in a year.—*Music and Education, by Dr. Mainzer.*

### THE POWER OF SILENCE.

What a strange power there is in silence! How many resolutions are formed; how many sublime conquests effected during that pause, when the lips are closed, and the soul secretly feels the eye of her Maker upon her. When some of these cutting, sharp, blighting words have been spoken which send the hot indignant blood to the face and head, if those to whom they are addressed keep silence, look on with awe, for a mighty work is going on within them, and the spirit of evil, or their guardian angel, is very near to them in that hour. During that pause they have made a step towards heaven or towards hell, and an item has been scored in the book which the day of judgment shall see opened. They are the strong ones of the earth, the mighty for good or for evil; those who know how to keep silence when it is a pain and a grief to them; those who give time to their own soul to wax strong against temptation, or to the power of wrath, to stamp upon her the mark of their withering passage.—*The Essayist.*

### CHARACTER *versus* TALENT.

Ability without upright principle is a snare to the possessor, and a curse to all connected with him. Without firmness and moral courage, the kindest dispositions and best intentions may be productive of evil rather than good. In the scale of morals, integrity holds the first place, benevolence the second, and prudence the third. Without the first, the latter two cannot exist; and without the last the two former are often rendered useless. The weight of exalted character will carry it over the want of an exalted station. Nothing will supply the want of prudence; and negligence and irregularity, long continued, will make knowledge useless, wit ridiculous, and genius contemptible.

**TO THE YOUNG.**—Drive envious feelings from your minds, and keep a bridle upon that little, but unruly member—the tongue. Speak well of all, more particularly of those absent, ever presenting the good qualities, when the bad ones are spoken of by others.

**EXAMPLE FOR PARENTS.**—The education of our children is never out of my mind. Train them to virtue, habituate them to industry, activity, and spirit. Make them consider every vice as shameful and unmanly. Fire them with ambition to be useful. Make them disdain to be destitute of any useful knowledge.—*Adams' (Ex-Pres. U. S.) Letters to his Wife.*

**THE HEAD THE SAFEST PLACE FOR MONEY.**—Dr. Franklin, in speaking of education, says: "If a man empties his purse into his head, no one can take it from him."

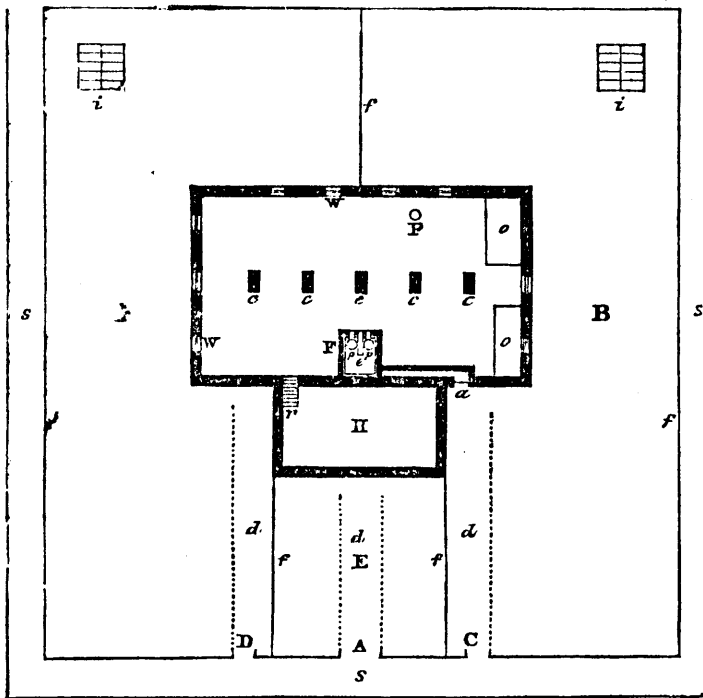
School Architecture.

ELEVATION AND PLANS OF A GRAMMAR SCHOOL-HOUSE—WITH EXPLANATION.

We give five illustrations of a very beautiful Grammar School-house in this number of the *Journal*. One—the *Front View*, with its shade trees and shrubbery, (*Fig. 1*)—will be found on the 81st page, and the remainder exhibiting the interior arrangements, &c., follow in this article.

Before proceeding to an explanation of the interior arrangements of the building, we wish to present a general view, on a reduced scale, of the ground plan of a Grammar School-house, including the cellar, yards, fences, gates, side-walks &c. This will be seen in the annexed figure.

(Fig. 2.)



GROUND PLAN, ETC., OF A GRAMMAR SCHOOL-HOUSE.

The grounds around the Grammar School-house contain from 13,000 to 20,000 square feet, or between  $\frac{1}{3}$  and  $\frac{1}{2}$  of an acre. These grounds are enclosed, and divided into two separate yards and a lawn, by substantial close board fences, *f, f, f, f, f, f*, (*Fig. 2*), 6 feet high, neatly made and painted white. The boys' play ground *B*, and the girls', *G*, are large; but the lawn *E* is small, and is planted with trees and shrubbery. The gravelled side walks *s, s, s*, running on three sides of the lot, are shaded by rows of elms, maples, and lindens, set near the curb stones. The gates *A, C, D*, and the gravelled walks *d, d, d*, lead to the front and the two side doors of the School-house. The out-buildings *i, i*, are arranged with a large number of separate apartments on both sides, all well ventilated, each furnished with a door, and the whole surrounded with ever-greens.

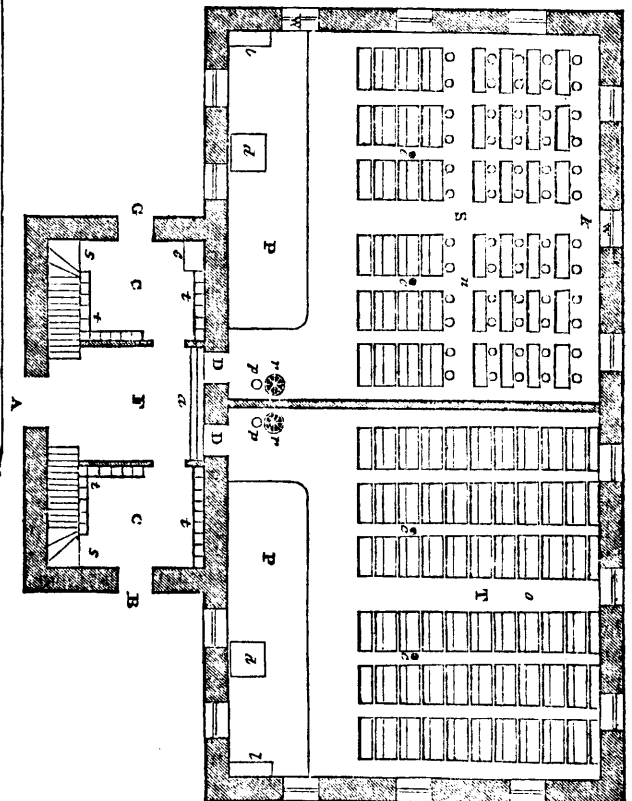
In the plan of the projection *H*, the stairway *r*, leads to the cellar, which is 7 ft. in the clear, and extends under the whole of the main building. The cellar is well lighted, having eight windows *w, w*, with 10 panes of 7 x 10 inch glass. The windows, being hung with hinges on the upper side, and fastened with hooks and staples at the lower edge, may be opened by raising them into a horizontal position, where they are fastened with hooks as when closed. With this arrangement it is easy to keep the cellars well ventilated at all seasons. The openings for the admission of fuel into the boxes *o, o*,

are furnished with sheet iron shutters, fastening on the inside. The School-house is provided with an abundant supply of good water, obtained from a fountain, or from a well, which is generally outside the building, the water being brought in by a pump *P*. A supply of good water for a School-house should not be considered merely as a convenience, but as absolutely necessary.

The horizontal section of the furnace *F* merely shows the ground plan. The cold air passes through *a* to the air chamber, where it is warmed by the fires in *p, p*,—two cast iron cylinders, 14 inches in diameter. The evaporator *e* holds about fifteen gallons of water, which is kept in a state of rapid evaporation, thus supplying the air-chamber with an abundance of moisture. In the plan and construction of the various parts of the furnace, special pains have been taken to remove all danger of fire—a consideration which should never be overlooked. The furnace is covered with stone, thickly coated with mortar, and the under side of the floor above is lathed and plastered, not only above the furnace, but at least ten feet from it in every direction. A full description of the construction and operation of these furnaces may be given in a future number of the *Journal*.

The cellar walls and the stone piers *c, c, c, c, c*, are well pointed, and the whole inside, including the wood work overhead, is neatly whitewashed, giving this apartment a neat and pleasant appearance. The walls of the building itself are of stone, about two ft. thick, faced with brick, and painted a tasteful colour.

(Fig. 3.)



PLAN OF THE FIRST FLOOR OF A GRAMMAR SCHOOL-HOUSE.

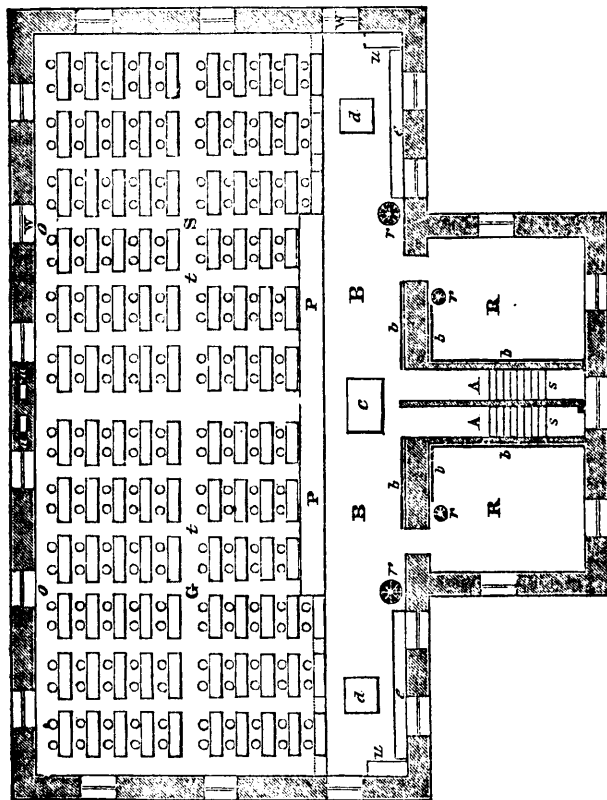
In this *Plan* there are three entrances to the building; the front *A*, and the two side doors, *B* for boys, and *G* for girls, leading into the entries *F, C, C*. The front is a large double door, with a beautiful frontice of fine hammered granite. At all the outside doors are two or three hewn granite steps, furnished with four or six scrapers at each door. Pupils belonging to the Schools in the lower story pass from the side entries into the middle one, and, ascending two steps at *a*, enter their respective rooms *T, S*, which are rather larger than those in the primary and intermediate School-houses, being 36 feet by 32 ft. inside, and 11 ft. high in the clear. In

each of the entries C, C, there is a provision *t, t, t*, for setting up umbrellas, as described on page 68 of this *Journal* for May.

The seats and desks in the rooms T and S are of the same dimensions, and arranged in the same manner as those in the primary School-house described at length on the 13th page of the *Journal* for January. A section of these seats and desks may be seen in *Fig. 5*. The small iron posts *c, c, c*, about 2½ inches in diameter, supporting the floor above, are placed against the ends of the seats so close as not to obstruct the passages at all. Besides the platforms P, P, 20 feet by 6 ft.,—the tables, 3 feet by 4 ft., for the Teachers, and the closets *l, l*, for brushes, &c.,—there are black-boards, painted upon the walls, extending from the doors D, D, to the windows, 14 ft. long by 14 ft. wide, with the lines of a stove painted on one end, to aid in giving instruction in vocal music.

These rooms are well warmed by heated air, admitted through registers *r, r*, (*Figs. 3 and 4*), 18 inches in diameter, from the furnace below, F, (*Fig. 2*), from which the tin pipes *p, p*, (*Figs. 2 and 3*), 14 inches in diameter, convey the air to the School-room in the second story. Each room is provided with two ventilators, each 3 ft. long by 15 inches wide, opening into flues of the same dimensions, which open on a level with the floor, and leading into the attic, from which the impure air escapes at circular windows in the gables. These flues thus remove the foul air from the lower parts of the room, and cause fresh, warm air to slowly settle down upon the scholars—a very pleasant and healthful mode of ventilation.

(*Fig. 4.*)



PLAN OF THE SECOND STORY OF A GRAMMAR SCHOOL-HOUSE.

The School-room in the second story is large, and with an arched ceiling (see Section, *Fig. 5*) measuring 12 ft. to the foot of the arch and 17 ft. to its crown. It is provided with two ventilators, 3½ ft. in diameter, placed in the crown of the arch, about 20 ft. apart.

The entrances to the second story School-room are by two short flights of stairs on a side; from the lower entries to *s, s*, (*Fig. 4*) spaces about 3 ft. square, and thence to A, A, spaces 3 × 5 feet, extending from the top of the stairs to the doors opening into the School-room.

The Master's table *c*, as well as the tables *d, d*, for the Assistants, are moveable. The large area B, B, being 14 inches above the

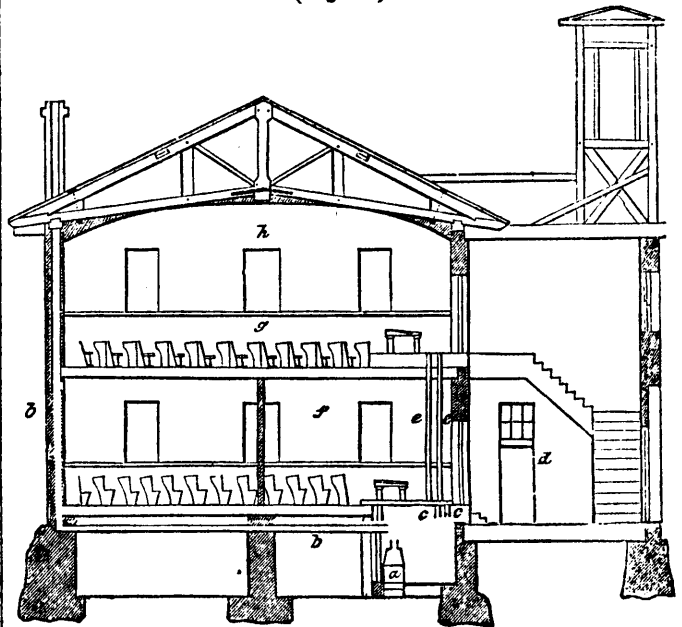
floor of the room, is 8 ft. by 64 ft. long, with large closets *u, u*, at the ends filled up with shelves, &c., for the use of the Teachers.

The School-room and the recitation-rooms R, R, are warmed by heated air, admitted at the registers *r, r; r, r*, all of which are connected with the furnace in the cellar, by large tin pipes or conductors.

The black-boards, 4 feet wide, painted upon the hard finished walls, are indicated by the lines *b, b; b, b*, in the recitation-rooms, and along the walls behind the Master's table, extending on each side to the windows beyond, *e, e*, making in the school about 300 ft. of black-board. The long benches *e, e*, are used for seating temporarily new pupils on their entering school, until the Master can assign them regular seats; also for seating Visitors at the Quarterly Examinations. The space P, P, a broad step, 18 ft. by 2 ft. wide, is used for some class exercise on the black-boards. The passage *t, t*, about 15 inches wide, running the whole length of the room, affords great facility in the movements of pupils to and from the recitations and other class exercises. The Master's class generally recite in the space *o, o*, at the back of the room, which is 4 ft. wide by 64 ft. long.

The windows W, W, which are hung with weights, and furnished with inside blinds, contain 12 lights each of 10 × 16 in. glass. The quantity of air furnished for each scholar is a matter of no small importance. Each room in a Grammar School, intended to accommodate 200 pupils, should contain over 35,000 cubic feet, deducting the space occupied by the furniture. This estimate allows every child about 150 cubic feet of air for every hour and a-half, on the supposition that no change takes place, except at the time of recess. But the rate at which warm air is constantly coming into the rooms from the furnace, increases the allowance for every child to about 300 cubic feet for every hour and a-half.

(*Fig. 5.*)



TRANSVERSE SECTION OF A GRAMMAR SCHOOL-HOUSE.

*Fig. 5* exhibits a section of the building as if it were cut through the centre. It shows in an end view the projection, belfry, rooms, seats, desks, and cellar. An imperfect outline of the warming apparatus is presented, giving an outline of its construction. The smoke pipe, connected with *a*, the heater, coiled twice around in the air-chamber, passes off in the direction of *b, b*, to the chimney. The short tin pipes *c, c*, conduct the warm air into the lower rooms; and the long ones *e, e*, convey it to the rooms in the second story. On each side of the projection, over the door *d*, is a window, lighting the outside entry, and also the middle entry by another window over the inside door. The end view of the seats and desks do not represent the different sizes very accurately, but sufficiently so to give a correct idea of the general plan.

## ON THE VENTILATING AND WARMING OF SCHOOL-HOUSES.—No. III.

To the Editor of the Journal of Education.

SIR—The next improvement in open fire-places, and which preceded the use of the close stove, was recommended by Dr. FRANKLIN, who invented what is now called the "Franklin Stove," which consists of a grate closed at the top, and placed at some distance from the chimney, with which it is connected by a pipe to carry off the smoke: a great amount of heating power was obtained by this means; but this is the only advantage that has been derived from its use.

As fuel became scarce, and consequently more expensive, any method by which economy in its consumption could be attained, would of course be eagerly adopted—the open fire-place became gradually reduced in size. Then came the Dutch, English, Russian, and American stoves, ending in Dr. ARNOTT'S stove, which is admitted to be the most economical of all; but in all these instances, no arrangement has been made for supplying fresh air to the apartments heated; economy in fuel has been the sole object, and this has been attained at the expense of ventilation. The following remarks from WYMAN'S work on Ventilation, are sufficiently illustrative of the foregoing observations:—"The various changes which the fire-place has undergone in one old house in Cambridge, Mass., known as the Danforth House, and said to have been built by one of the early Presidents of Harvard College, will illustrate the progress in house warming. The fire-place in the parlour was originally 8 feet wide by 3 deep, and 4 feet high. The first alteration was in the diminution of the fire-place (*Rumfordizing* it), by lowering the mantel to 3 ft. and reducing its length to less than 5 ft., by which a good closet was secured on each side within the jambs. Within this structure was afterwards placed an iron *fire frame*, for the combustion of wood; and this, again, received a grate for burning anthracite coal, the front of which is now bricked up and receives the funnel of a *cooking stove*. The improved heating and diminished ventilation are easily traced." The difference of heating by means of stoves, and open fire-places, is, that by the former the air is heated rather by conduction than radiation; whilst the reverse is the case by the latter method. The advantages gained by the use of stoves, in preference to open fire-places, are, economy in the consumption of fuel, a more equal temperature, and a greater freedom from smoke and dust. These advantages, it will be perceived on a moment's reflection, are merely comparative; the evils complained of are only lessened, not removed. The increased inconvenience arising from the use of stoves, are, a sensation of extreme dryness, and a burnt and sulphurous odour, produced by the heated air of the stove, which decomposes some of the impurities with which the air of ventilated rooms become loaded: the effects on the system are, giddiness, severe headache, and dryness of the throat; and this is the invariable result in every instance, though some persons feel it more than others. The inconveniences of ventilating a stove-heated room by the ordinary method, have been already shewn. These inconveniences have been to a certain extent removed by what is termed the "Boston School Stove:" this stove has been constructed on what is termed the hot-air principle, and is merely an ordinary stove, surrounded by a metal casing, through which the external air is drawn into the room, which in its passage becomes heated, by coming in contact with the interior casing of the stove: thus a supply of pure warm air is obtained, and the vitiated air passes off through two openings in the side of the room, opposite to that where the stove is placed; one of the openings which is to be placed at the top of the room, should be only half as large as the other, which is placed at the bottom. The amount of pure air obtained in this manner must of necessity be limited. It is, however, a great improvement in the common stove, though the evils connected with this mode of heating are not altogether removed.

I have thus far endeavoured to trace the gradual improvements which have been made in ventilation, and warming; I have not, however, as yet, touched on the comparative expense of these improvements, a decided advantage in this respect will also be proved before the discussion of these subjects is concluded.

I have the honor to be, SIR,

Your obedient Servant,

KIVAS TULLY,

Architect & Civil Engineer.

Toronto, April 30th, 1849.

## Educational Intelligence.

CANADA.

*Teachers' Address to W. L. DISTIN, Esq., Mayor of the City of Hamilton, on the occasion of the Feast given by His Worship to the Teachers, Pupils of the Common Schools, on the Queen's Birth Day.* The *Hamilton Gazette* says:—The children of the different public Schools assembled in the Court House Square, where they formed in procession and marched to the green in front of the residence of P. H. HAMILTON, Esq., to partake of "the Feast" prepared for them by our worthy and highly esteemed Mayor. Here the Teachers took the opportunity of presenting the following Address:—

To His Worship the Mayor of Hamilton:

SIR,—We, the Teachers of the Common Schools in this City, beg to present you our most grateful thanks for the kind and hospitable manner in which you have condescended to notice the children under our tuition, on this the annual return of the natal day of our beloved Sovereign, QUEEN VICTORIA, and, as a duty incumbent, on all loyal subjects, we give thanks to God for the protection He has afforded her during the past year, and also for the success that has attended her armies in quelling rebellion, and subduing her foes, amid the wreck of surrounding nations.

We congratulate you, Sir, as being the first gentleman to set the worthy example of sowing the good seed of loyalty in the right soil, for we presume you will admit that the stability of our Monarchical Government and glorious Constitution depends greatly upon the religious instruction, the moral training, and the mental cultivation of the rising generation. We think we are justified in saying, that no country can long continue prosperous and happy, unless its population, from the prince to the peasant, take the word of God as the basis of their morality, and its divine precepts as the foundation of their laws, therefore, as we value the loyal integrity of our inhabitants, and the stability of our institutions, let the youth of our country receive a Scriptural, as well as a literary education, by doing which we will be obeying the injunction of the Holy Spirit, as dictated to the wisest of men, "Train up a child in the way he should go, and when he is old he will not depart from it."

In conclusion, Sir, we again thank you for your kindness and liberality to our scholars and ourselves this day, and we earnestly pray, that you may be spared to witness many happy returns of the same, that our country may become prosperous and the people happy, and that it will ever continue to be an integral portion of the British Empire.

To which Address His Worship was pleased to reply as follows:—

GENTLEMEN,—I sincerely thank you for the kind expressions contained in the paper you have just read, and that this *small act of my duty* has met with your approbation. My conviction has always been, that early impressions are lasting, either in morality or loyalty, and perfectly agree with you that, when a child is taught in the way he should go, in old age he will not depart from it. Gentlemen, I am fully aware of the arduous duty you have to perform; but it is a glorious duty "to teach the young idea." Persevere in the good work, and as you sow, so shall you reap, if you faint not. Again tendering you my thanks, rest assured my humble efforts in promoting the interest of Public Schools will always be considered a duty of pleasure.

And now my dear children, let me impress upon your minds that this is the QUEEN'S BIRTH DAY,—a holyday that you will remember as long as you live; and that when you are grown up to be men and women, will have the happy effect of strengthening your loyalty. Recollect to be dutiful to your Parents and your Teachers, who are kindly instructing you for your future good. Never forget the command of God, that you are not to swear, or steal, or tell falsehoods, or kill, or commit other wicked acts, and above all things that you "Fear God and honour the Queen."

Three cheers were then given for the Queen, and right heartily did the youthful voices join in the enlivening strain.

*Simcoe Ladies' Seminary.*—A public Examination of this Institution took place on Wednesday last, the attendance of persons interested in this Establishment was numerous and respectable. The rapid advance in useful knowledge made by the pupils, is no less creditable to the Misses WEBB, than it must be gratifying to the parents and guardians of the scholars. The selections of vocal and instrumental music were extremely good, and added much to the interest of the examination; Mr. TRANSUM, superintended and led the singing classes, their proficiency and correctness reflect much credit on his abilities as a Teacher.

The exhibition of fancy work, &c., would have been creditable to any Institution in the Province.—[*Simcoe Standard.*]

*The Quarterly Examination of the School in Section No. 5, in the Township of Lanark,* took place on Wednesday, the 13th inst. The parents of the scholars and others resident in the School Section were present, and were so highly satisfied with the faithful and efficient manner in which Mr. THOMAS KEYS had discharged his duty as a Teacher, that an unanimous vote of thanks was awarded him by the persons present, linked to expression of regret at his departure from among them. And as a proof that while he enjoyed the esteem of the parents, he had also gained the affections of the children, his scholars presented him with several neat memorials, consisting of a Bible, a Pencil Case, &c., &c.—[*Perth Constitutional.*]

**Normal and Model Schools for U. C.**—The Summer Session of the Normal School for 1849, commenced on the 15th of May. Out of 123 applicants, 106 Students were admitted—83 males and 23 females. The remainder were rejected for want of the necessary literary qualifications. With few exceptions the Teachers-in-Training this Session were formerly Common School Teachers.

The accommodation in the Model School having been lately extended, the daily attendance of pupils is now 300. The number of applicants' names on the books for admission into the school exceeds 100.

**Pictou Ladies' Academy.**—A public Examination at the Pictou Ladies' Academy took place on Monday and Tuesday last. We understand that the different classes evinced a very satisfactory knowledge of the different branches of learning on which they were examined. The literary compositions of the young ladies reflected on them great credit. The paintings exhibited were mostly landscapes, in which water was a prominent object. The designing was good, and the color very well put on.—[P. E. Gazette.

**Education in Halifax, Nova Scotia.**—Halifax bids fair to become a modern Athens for learning—the former dearth of educational Institutions having given place to some half-a-dozen Academies for imparting knowledge to the rising generation. Dalhousie College is, we are glad to learn, exceedingly well supported, and the system pursued is highly spoken of.—[Halifax Times and Courier.

BRITISH AND FOREIGN.

**The Home and Colonial School Society.**—The examination of the children of the school of this society, and the annual public meeting of its subscribers and friends, took place on Monday week, at the institution in Gray's-inn Road. The lessons were of unusual interest to the older children, bearing on the commerce and manufactures of the country. Amongst the visitors were the Earl of HARROWBY, Lord HENRY CHOLMONDELEY, &c. The Hon. and Rev. MONTAGUE VILLIERS presided at the meeting. This society has greatly enlarged its premises, and now trains upwards of two hundred females annually. Its system of moral and religious training is highly popular.

**University of London.**—A numerous and exceedingly agreeable réunion of the members of this University took place on Wednesday evening, May 9th, in the academical apartments of the college in Somerset House. The University of London has now granted degrees for some years past, under the powers conferred upon it by Royal charter, and the graduates having at length become a very numerous body, the noble Chancellor (the Earl of Burlington) a short time since suggested to the Council his desire to assemble such of the members of the University as could conveniently attend at a *soirée*, where he might have the gratification of meeting them. The project was at once entertained, and the noble Earl dispensed a right courteous hospitality to a circle of nearly 600 guests, including, in addition to the graduates referred to, the heads of King's College, and many other academical institutes connected with the University of London.

**British and Foreign School Society.**—On Monday, May 7th, the annual meeting of the friends and supporters of this society took place in the large rooms at Exeter Hall, which was crowded in every part. The Earl of Carlisle occupied the chair; and amongst those present were the Bishop of Norwich, the Bishop of Manchester, Lord Monteagle, Sir E. N. Buxton, W. Tooke, Esq., S. Gurney, &c. The report stated that 103 new schools, which were attended by 10,000 children, had been established during the year in seventy-eight different localities. The model school at Bristol had been attended by 919 boys throughout the year, and by 31,399 since its commencement. The relative number of girls in attendance was 450 and 19,294.

**Orphan Working School.**—The commemorative festival to celebrate the 91st anniversary of this charity was held on Wednesday, May 9th, at the London Tavern, Bishopgate Street, Sam'l Morton Peto, Esq., M.P., one of the Vice-Presidents of the charity, in the chair. The institution was formed in 1758, 91 years since, for 20 boys. It had now under its care 200 children—129 boys and 71 girls.

**The New Military School at King's College** was opened on Tuesday week, for the study of tactics and the art of war. It is under the superintendance of Captain Walker, of 69th Regiment. The pupils, in addition to the military instruction, receive lessons in the languages of the East, in order to fit them for the Indian army.

**Royal Freemasons' School for Female Children.**—On Wednesday evening, May 9th, the 64th Anniversary Festival of this charity was celebrated in Freemasons' Hall, when about 300 members of the craft were present, the Earl of Zetland presiding. The school was founded in 1788.

**Model Farm of the Society of Friends, Galway, Ireland.**—The Society of Friends have taken on lease, and just entered into possession of above 400 acres of arable land, and about as much bog, at Colmanstown, County Galway. The association is about to expend, we understand, £10,000 in establishing a model agricultural farm, under the superintendence of Dr. BEWLEY, of Moate. The establishment of a model farm on such a scale must prove of incalculable advantage, not only by affording employment and instruction to the peasantry and farmers, but in raising their drooping spirits, by showing them that men of prudence and industry are still willing to embark large capital in agricultural pursuits.

**Educational Convention in New-York in August.**—The Teachers' Association of the State of New-York, which was the first Association of the kind formed in this country, is probably still the largest body of practical educators that has ever combined for the purpose of promoting popular education and elevating the profession of teaching. It will be remembered that the first meeting of the Teachers of the State was at Syracuse, in the year 1845. The next annual meeting will be held in the City of New-York on Wednesday, the 1st of August, 1849, and will probably continue in session for two or three days. This Society courts correspondence with all other associations which have in view similar ends. It is professional in its character, but catholic and liberal in its mode of operation.—[N. Y. Teacher's Advocate.

**Inauguration of the President of Harvard University.**—The inauguration of the Rev. JARED SPARKS, LL.D., President elect of Harvard University, will take place on the 20th of June, with the usual appropriate ceremonies.

**Public Schools in Boston, U. S.**—The following Table of the Public Schools in the City of Boston, showing the date of their establishment, the time when the buildings now occupied by them were erected, and their cost, is compiled from the Boston Almanac for 1849. In addition to these, there are 160 Primary Schools, 113 of which are kept in buildings owned by the city. The number of pupils in these schools in 1820, was, 1,384; the number in 1848, was, 9,850. The pupils have increased at the rate of 280 per cent., while the population has increased only 130 per cent. Of the children attending these Primary Schools, a small majority,—about fifty more than half of the whole number,—are the children of foreign parents!

	Established.	Erected.	Cost.
Latin School, .....	1647	1844	\$57,510 81
Eliot do. ....	1713	1838	24,072 00
Adams do. ....	1717	1848	20,000 00
Franklin do. ....	1785	1845	18,394 00
Mayhew do. ....	1803	1847	35,792 59
Hawes do. ....	1811	1823	5,889 29
Smith do. ....	1812	1834	7,485 61
Boylston do. ....	1818	1818	13,343 17
Bowdoin do. ....	1821	1848	44,980 14
Eng. High do. ....	1821	1844	in building with Latin School
Hancock do. ....	1822	1847	69,603 10
Wells do. ....	1833	1833	28,098 87
Johnson do. ....	1836	1835	26,715 14
Winthrop do. ....	1836	1835	23,897 00
Lyman do. ....	1837	1846	13,596 27
Endicott do. ....	1839	1840	22,337 07
Mather do. ....	1842	1842	21,314 80
Brimmer do. ....	1843	1843	22,151 21
Phillips do. ....	1844	1823-5	24,484 03
Otis do. ....	1844	1844	25,791 78
Dwight do. ....	1844	1845	30,000 00
Quincy do. ....	1847	1847	60,210 18

\$595,667 11

One Latin School, one English High School, twenty Grammar Schools, one hundred and sixty Primary Schools, the investment of nearly six hundred thousand dollars in the erection of School-houses, the annual expenditure of about one hundred and sixty-eight thousand dollars in the payment of Teachers' salaries,—these constitute the data, from which may be inferred the degree of importance attached by the city of Boston to the education of her citizens! The whole, in the language of the writer, from whom we obtain the above statistics, constituting a sacrifice of property, for the good of future generations, which stands forth without a parallel, probably, in the world's history.



# JOURNAL OF EDUCATION.

TORONTO, JUNE, 1849.

THE NEW COMMON SCHOOL ACT, which passed the Legislature during the last few days of the late Session, will not come into operation before the beginning of the year 1850. All the school affairs of the present year will therefore be conducted, and all the School Reports will be prepared and transmitted in the same manner as heretofore. It is highly important, however, that Trustees should see that the School Rate-bills imposed by them for the present year be collected before the expiration of the year; as otherwise Trustees may be held individually responsible for the amounts they have agreed to pay Teachers, and which they shall have neglected to collect, as authorized and empowered by law. All the School engagements and School affairs of the year should be fulfilled and wound up by the end of the year, before the power to execute them expires. This is a matter which deeply interests both Trustees and Teachers. District Superintendents will continue in office until the 1st of March, 1850, for the purpose of completing and transmitting to the Education Office their Annual Report for the year 1849.

**PERSEVERANCE CROWNED WITH SUCCESS AND HONOUR.**—The name of the Hon. HORACE MANN is now the theme of unanimous applause and admiration amongst all educational writers and publications in America for noble and successful exertions in the cause of Christian and universal education. But it may not be so generally known that the earlier part of Mr. Mann's twelve years' labour in the cause of popular education, was by no means free from vehement attacks and various kinds of opposition. The following passage from the last Annual Report of the Massachusetts Board of Education shows how much Mr. Mann's success is owing, under the divine blessing, to his great zeal, industry, decision and ability, "through evil as well as through good report :—

"We need not say, that Mr. MANN has faithfully performed the duties of the office he has held, for twelve years, and thoroughly aroused the people of this commonwealth to the importance of Common School education. He has devoted himself to this great work with a noble, self-denying zeal, and has enstamped his name so deeply on the educational interests of the State, that it will never be effaced. It has been his lot, in common with others ardently devoted to plans for promoting human welfare, to be looked upon by suspicion by some, and to encounter opposition; but this Board feel assured that he has honestly laboured to raise the standard of intellectual and moral education, uninfluenced by any sinister motive. In parting with one, who has performed a good service for the State, we deem it a pleasure, as well as a duty, to bear this, our public testimony, to the fidelity and good faith with which he has performed the duties of his office."

## DOES PUBLIC SENTIMENT IN FAVOUR OF POPULAR EDUCATION INCREASE IN UPPER CANADA ?

We answer, with infinite pleasure and satisfaction, *it does.*

1. If the amount contributed each year in the various Municipalities of Upper Canada be an indication of the progress of public sentiment on the subject, then we can answer most decidedly, it does; and present the following facts in proof :—In 1846, notwithstanding the inevitable derangement in school affairs, occasioned by the transition from one School law to another, the total amount available for the salaries of legally qualified School Teachers in Upper Canada—exclusive of the Legislative

*School Grant*—was, . . . . . £47,079 16 7½  
In 1847, exclusive of ditto, . . . . . 57,093 10 8  
In 1848, exclusive of ditto, . . . . . 66,821 3 11¼

or an increase in the local voluntary contribution of the people at the rate of about £10,000 a-year since 1846 !

2. If the *nominal* and *average* attendance of pupils at the Common Schools, as compared with the School population, be a test of the progress of popular education in Upper Canada, then we have no reason to be dissatisfied with our progress. The statistics are as follows :—

	School Population in Upper Canada.	Nominal Attendance of Pupils.	Average Attendance of Pupils.
In 1846, . . . . .	204,580	101,912	*No Report.
In 1847, . . . . .	230,975	124,829	89,991
In 1848, . . . . .	241,102	130,739	114,800

3. If the number of official visits made by School Visitors and others to the Common Schools be an indication of the deep and growing interest evinced by the most influential members of the community in the success of these institutions, then we have reason for congratulation on this point. The following are the official returns of School visits :—

In 1846, by Superintendents of Com. Schools, &c.,	5,925
In 1847, by Superintendents of C. S. and Visitors,	11,675
In 1848, by ditto ditto	13,935

Of these visits, 1823 were made by the Clergy of the Province in their capacity as School Visitors in 1847; and, 2254 in 1848. The remaining visits were made by District Superintendents, Municipal Councillors, Magistrates, and others. They indicate a very satisfactory progress.

4. If the adoption, in very numerous instances of the *Free School System* in various parts of the Province, be a proof of the spread of sounder principles than has heretofore prevailed in regard to a more generous system of universal education, then we have cause for rejoicing for the future prosperity of Upper Canada.

In various parts of the Niagara, Prince Edward, Talbot, Brock, and other Districts, this patriotic and popular mode of raising the Teacher's salary has been adopted, and the fruits are seen in the much larger attendance of pupils, the tranquillity of the School Sections, the absence of all causes of local differences between Trustees and their neighbours and the Teacher on School matters, and the general prosperity of the Schools themselves. We give some of the statistics of a few Districts for the last year, showing the effects of even the partial adoption of the Free School system in a District upon the School attendance of such District, as compared with other Districts and Towns in which no movement has been made in this direction.

Districts and Towns in which the Free School system has been in partial operation during the year 1848 :—

	School Population.	Pupils.
Niagara District, . . . . .	11,848	9,348
Niagara Town, (adopted fully) . .	668	716
Prince Edward District, . . . . .	5,634	4,212
Talbot District, . . . . .	6,694	4,365
Brock District, . . . . .	9,414	5,811

Districts and Towns in which the Free School system has not been in operation during the year 1848 :—

	School Population.	Pupils.
Home District, . . . . .	28,589	13,784
City of Toronto, . . . . .	5,500	1,678
Colborne District, . . . . .	7,700	2,995
Huron District, . . . . .	5,482	2,459
City of Kingston, . . . . .	3,461	524

5. We might refer to many other indications of the progress of public sentiment in Upper Canada in favour of the great work of popular enlightenment which could not fail to create satisfaction

and pleasure in the minds of the ardent friends of Education ; but having, in connexion with two very comprehensive tables of School statistics directed the attention of our readers to this subject in our last, we simply confine ourselves to an additional remark or two.

The years 1846-48 have been signalized by the establishment of a Provincial Normal and Model School, and by the very general introduction into our Common Schools of a uniform series of excellent Text Books. Our Schools have increased since 1846 from 2589 to 2800. School celebrations and interesting quarterly examinations have, in a great degree, contributed to our progress ; while the number of superior School-houses which have been erected, and are now in course of erection, the more general demand for competent Teachers, the popularity of well trained Teachers from the Normal School, and the decided increase in the amount of salary given each Teacher by the local Trustees, indicate the existence of a widely extended and more deeply rooted feeling of progress in the minds of the people generally ; and a determination to sustain the interests of what, to a vast majority of them, is their only College ; and to elevate to its proper position the highly honourable yet laborious profession of School Teaching.

There is still however a vast amount of serious responsibility resting upon the people of Upper Canada in regard to their Common Schools ; and particularly upon the more intelligent and influential members of the community. In addition to the greatness and vast importance to the best interests of the Country itself of the complete success and efficiency of the Common Schools, let it be remembered that this is now an eventful and critical period in the history of our educational state and progress as a people. The fact that those more immediately concerned are themselves becoming so anxiously alive to the character and prosperity of our elementary schools should induce a strong and vigorous effort on the part of such as from their local position and influence have the power to effect much good, to cordially unite in the noble efforts of the people, and animate them to still further exertion by their spirited example. To hesitate or appear listless is to pluck up the tender vine, or to destroy the budding germ of noble and generous fruit. The seeds of Canada's intellectual future may now be sown broadcast by the hands of her own faithful and patriotic sons. The soil is rich and fertile. As yet no rank weeds appear upon its surface to shut out the bright sunlight from the tender plant, or to mar the general beauty of its broad, fair landscape. The grain of mustard seed is as yet in the hands of the sower, or but just dropped into the fruitful furrow, whence it will spring forth the mighty monarch of the forest, casting its sweet and pleasant shade across the land.

The deep anxiety and unwearied solicitude of the "Fathers of New England" to nurture and protect the budding destinies of their country during its intellectual infancy presents an affecting lesson for our study, and an example, in its spirit and practical tendency, worthy of our imitation. As an instance of this paternal solicitude of the early New Englanders, Mr. BANCROFT, the present American Ambassador at the Court of St. James, in his "History of the United States," quotes the following striking passage from the history of Harvard University, Massachusetts, which is of so touching a character that we cannot refrain from giving it entire :—

"In 1620, the Pilgrims landed in America. In 1633 the General Court voted a sum, equal to a year's rate of the whole colony, towards the erection of a College. Two years after, John Howard bequeathed to the College one-half of his estate and all his library. The infant institution was a favourite. The Towns in the east often contributed little offerings, while the gift of the rent of a ferry was a proof of the care of the State ; and once a year, every family in the colony gave to the College at Cambridge twelve pence or a peck of corn ; while the magistrates and wealthier men were profuse in their liberality. The celebrated Bishop Berkeley in 1730 bequeathed to Harvard and Yale Colleges, New England, a farm he had purchased on his arrival in America, whither

he had come to found a college at Bermuda, and the books he had exported. *The College in return exerted a powerful influence in forming the early character of the country.* In this at least it can never have a rival. In these measures (continues the elegant Bancroft) especially in the laws establishing Common Schools, lies the secret of the success and character of New England. Every child, as it was born into the world, was lifted from the earth by the genius of the country, and in the Statutes of the land received as its birthright, a pledge of the public care for its morals and its mind."

What an example for Upper Canada ! If she too by wise laws and generous solicitude lays the foundation of her future moral and intellectual greatness, how rich a legacy will she bequeath to her sons ! Let every child in Canada, as in New England, as it is born into the world, be lifted from the earth by the genius of the country, and in the Statutes of the land let it receive as its birthright a pledge of the public care for its morals and its mind !

STRIKING APPRECIATION OF THE MISSION AND DUTIES OF A TEACHER—PRACTICAL ADVICE.—To be able, in appropriate terms, to offer suitable advice to a man engaged in his own profession is a rare accomplishment on the part of a non-professional man. In the profession of School Teaching, however, the experience of a practical statesman, or of an acute observer of the effects upon national character of the strong, the varied, and often unnoticed influences which are continually acting and reacting upon society, is frequently of the highest value to the comparatively secluded Teacher. The experience of the latter is often circumscribed and local ; while that of the former is necessarily extensive and general. The characteristics of this last mentioned experience are admirably embodied in the following very excellent suggestions made on the ceremony of opening the Free Academy in New-York, in January last, by the Chairman of the City Board of Education, under whose directions the Free Academy has been established. The suggestions refer to the mode of teaching the leading branches of Education :—

"Let the spirit of Christianity pervade your teaching, as it pervades the laws of the land, and the administration of justice. Teach that the truths of Nature rest upon the truth of God. Demonstrate, that at the foundation of every science, lies omniscient wisdom ; that all of beautiful or sublime truth is but a development of the Divine mind. Point to the limits, where man, by searching, can find out no further, because he meets the unrevealed mysteries of the Divine power. Let the serene light of a pure religion permeate every science, brightening, and blending with its beauty and truth, like a lamp, set within a vase of alabaster, bringing out into bolder relief and more exquisite effect, the forms and ornaments that are sculptured upon it.

"When the illuminated page of Grecian and Roman civilization is opened to the pupils, and the achievements of heroic virtue, the matchless creations of art, the splendours of genius in poetry and eloquence, fascinate their imaginations ; you will open, opposite to it, another page, all black with infamy, the record of the voices of that ancient world, unilluminated by a single ray of holiness. If you lead them to the promenade where the school of Aristotle met, or to the porch of knowledge where Zeno taught, or bid them sit in the shady groves of that ancient Academy, where wisdom fell, in words sweet as those of poets, from the lips of Plato, you will conduct them, also, to the altars reared to false and unknown gods.

"When, beneath the varied surface of this earth, you show them those tablets of stone, on which are graven the only records of its primeval ages, let them trace on them, as on the tables of the law written upon Mount Sinai, the finger of God. You will teach them, that the records of God's power and the revelation of his will, the registers of an eternity past, and the chart of an eternity to come, shall one day be beautifully reconciled, in perfect gospel harmony. You will tell them, that should voices come forth from the tomb of buried centuries, full of dark and doubtful import, they may be like the false oracles of ancient times, issuing from the earth only to beguile those who trusted in them—that should Science seem to declare, that the Jehovah, who spake by the lips and the pen of Moses, of the creation of the world and the origin of our race, is to be dethroned ; they have only to wait, until, by a more potent adjuration, she be compelled to make a fuller, a clearer, and more truthful utterance—for Science, exercised and dispossessed, shall one day sit humbly at the foot of the cross, and the Pythoness shall become a Prophetess."

## Selections

### THE MODEL SCHOLAR.

[The following is a PREMIUM ESSAY, written for the *Scholars' Penny Gazette*, by Miss E. PARK, of Dudley High School, Roxbury, Mass.]

The various parts, which, when summed up, form the character of the model scholar, are so numerous, that it would occupy more time and space than I have to describe them. There are many things which are useful, and yet which cannot be deemed absolutely essential.

Thus, natural talents, though they may be rendered, when not perverted, a blessing to their possessor and to mankind, are still not necessary; for a scholar with only common talents, can, by cultivating those which it has pleased his Maker to bestow upon him, and by acting according to the principle of right within him, render his career an example worthy of imitation by all of his companions.

He who would be a perfect scholar, must be actuated to the performance of his duties by proper motives; if he is not he will never succeed. He should also acquire knowledge, not that through it he may be known to fame, not from ambitious motives, but that by acquiring it he may benefit his species; for we are not furnished with talents merely for our own advantage, but for the advancement of those around us.

Some seek wisdom from a wish to excel, from a desire to be first in everything—some for the reward it brings them, and others from curiosity, from a wish to search into the mysteries of nature, and become acquainted with her hidden springs of action. But he who acquires it for his own sake, must sooner or later triumph.

Perseverance is also a necessary principle in the character of the model scholar. Without it, he can do nothing, for at the least obstacle he will become discouraged. Many who have commenced the pursuit of knowledge with a determination never to flag, have become disheartened from the rough and toilsome road they were traveling.

Without perseverance, Cæsar and Napoleon would never have crossed the Alps. The mighty discoveries of Newton, which will cause his name to be remembered as long as science and truth shall be known, would never have been made, unless he had possessed, united with his great talents, an indomitable perseverance.

Let no scholar, then, despair; let each remember that this distinguished man was once a boy like himself, toiling up the ascent to greatness, and though he may not possess talents to shine as a second Newton, he may still be able to perform his part in the great drama of life, in as creditable a manner.

The model scholar should also be endowed with self-respect, such an inward conviction of his own worth as will deter him from stooping to perform any of those contemptible actions, on which school-boys too often pride themselves.

He should never allow himself to speak disrespectfully of his teachers. On the contrary, he should always feel grateful for their instructions, and endeavour, by every means in his power, to obey their wishes. He should listen with attention to all that is said, and never allow his mind to be drawn away from the subject by anything that is occurring around him; for what can be more discouraging to a teacher, than inattention on the part of one whose mind he is endeavouring to improve.

He should conduct with respect toward his superiors, and with affability towards his inferiors. Not, however, that condescending affability, which would seem to signify a wish to impress on them an idea of his superior attainments, for such an action would excite disagreeable feelings, and tend to make him more an object of their ridicule than respect.

He should bear with calmness the sneers of the envious. He must expect to meet with them, for there will always be found those ready to decry merit, wherever it may be found; but if he stoops to resent their conduct, he renders himself a worthy object of their contumely.

He should be careful to obey the rules of the school, and comply with the will of his teachers. The rules are made to maintain order, and are as necessary to a school, as laws to a country; for in school, as well as in communities, you can always find some

who will not do right unless they are compelled. A scholar should not feel that he ought to be exempted from the performance of any required duty; for much depends upon example, and if one is allowed to disobey with impunity, others will feel at liberty to do so.

He should be punctual in his attendance at school, for frequent absence is not only detrimental to his own interests, but is also injurious to the interests of his class.

He should always exercise politeness towards his companions, for much of our success in life depends upon the character that we carry with us into the world, and if while at school we habituate ourselves to rudeness, we shall never be able to free ourselves entirely from it.

If he perceives one below him, who is endeavouring to climb the steep hill of knowledge, and who has become discouraged at the many obstacles in his path, he will reach forth a helping hand, and cheer him on with words of hope and consolation.

If, then, a scholar is actuated by motives, loves wisdom for its own sake, is possessed of self-respect and kindly sympathies, adopts truth and perseverance for his guide, endeavours to obey the rules of the school, attends to the instruction of his teachers, and is punctual in his attendance, he may be considered a model scholar; his example may be presented as worthy of imitation.

And when he has passed through this inferior school, he will be fitted to enter the great school of life, in which we must prepare for the world to come, where, according as we have made the best use of the talent intrusted to our keeping, or have allowed it to rust in obscurity, we shall be admitted to the enjoyment of everlasting pleasure in an eternal home, or be dismissed from the presence of the Creator, as unworthy.

### THE BIBLE.

There is no book in any Country, in any language, in any age, that can be compared with this. From one page of this wonderful volume, more may be acquired, than reason or philosophy could acquire by the patience and toil of centuries. The Bible expands the mind, exalts the faculties, develops the powers of the will and of feeling, furnishes a more just estimate of the true dignity of man, and opens more sources of intellectual and spiritual enjoyment, than any other book. Science and literature have taken deep root in this consecrated soil. No book furnishes so many important hints to the human mind; gives so many clues to intellectual discovery, and has so many charms in so many departments of human inquiry. In whatever paths of science, or walks of human knowledge we tread, there is scarcely a science or pursuit of paramount advantage to mankind, which may not either trace its origin to the Bible, or to which the Bible will not be found to be a powerful auxiliary. Whether we consider its influence upon an oral and written language—upon history and literature—upon laws and government—upon civil and religious liberty—upon the social institutions—upon moral science and the moral virtues—upon the holiness which fits men for heaven, and the peculiar spirit and exalted character which prepares them to act well their part on earth—upon the happiness they enjoy in the present world—or upon the agency and power by which these desirable results are secured; we shall be at no loss to see that the world in which we live is under everlasting obligations to a supernatural revelation.—*Rev. Dr. Spring, of New-York.*

### THE GENTLEMAN.

When you have found a man, you have not far to go to find a gentleman. You cannot make a gold ring out of brass. You cannot change a Cape May crystal to a diamond. You cannot make a gentleman until you have first a man. To be a gentleman, it will not be sufficient that to have had a grandfather.

To be a gentleman does not depend upon the tailor or the toilet. Blood will degenerate. Good clothes are not good habits.

A gentleman is just a *gentle*-man: no more, no less; a diamond polished, that was first a diamond in the rough. A gentleman is gentle. A gentleman is modest. A gentleman is generous. A gentleman is slow to take offence, as being one that never gives it.

A gentleman is slow to surmise evil, as one that never thinks it. A gentleman goes armed only in consciousness of right. A gentleman subjects his appetites. A gentleman refines his taste. A gentleman subdues his feelings. A gentleman controls his speech. A gentleman deems every other better than himself. Sir Philip Sidney was never so much a gentleman—mirror though he was of England's knighthood—as when, upon the field of Zutphen, as he lay in his own blood, he waived the draught of cold spring water, that was brought to quench his mortal thirst, in favour of a dying soldier. St. Paul described a gentleman, when he exhorted the Phillippian Christians: "Whatsoever things are true, whatsoever things are honest, whatsoever things are just, whatsoever things are pure, whatsoever things are lovely, whatsoever things are of good report, if there be any virtue, and if there be any praise, think on these things."

And Dr. Isaac Barrow, in his admirable sermon on the calling of a gentleman, pointedly says, "he should labour and study to be a leader unto virtue and a noble promoter thereof: directing and exciting men thereto by his exemplary conversation; encouraging them by his countenance and authority; rewarding the goodness of meaner people by his bounty and favor; he should be such a gentleman as Noah, who preached righteousness, by his words and works before a profane world."—*Bishop Doane.*

### THE DYING BOY.

It must be sweet in childhood, to give back  
The Spirit to its Maker; ere the heart  
Has grown familiar with the paths of sin  
And down—to garner up its bitter fruits.

—I knew a boy, whose infant feet had trod  
Upon the blossoms of some seven springs,  
And when the eighth came round and call-  
ed him out

To revel in its light, he turned away,  
And sought his chamber to lie down and die.  
'Twas night—he summoned his accus-  
tomed friends,

And, in this wise, bestow'd his last bequest:

"Mother, I'm dying now!  
There is deep suffocation in my breast,  
As if some heavy hand my bosom pressed;  
And on my brow

I feel the cold sweat stand;  
My lips grow dry and tremulous, and my  
breath

Comes feebly up. O, tell me, is this Death?  
Mother, your hand—

Here—lay it on my wrist  
And place the other thus beneath my head  
And say, sweet mother, say, when I am  
dead

Shall I be missed?

Never beside your knee  
Shall I kneel down again at night to pray,  
Nor with morning wake and sing the lay  
You taught to me.

Oh, at the time of prayer,  
When you look round and see a vacant seat;  
You will not wait then for my coming feet:  
You'll miss me there!"

"Father—I'm going home!  
To the good home you spoke of, that blest  
land  
Where it is one bright summer always, and  
Storms do never come.

I must be happy then,  
From pain and death you say I shall be free;  
That sickness never enters there, and we  
Shall meet again!"

"Brother—The little spot  
I used to call my garden, where long hours  
We've stayed to watch the budding things  
and flowers.

Forget it not!

Plant there some box or pine;  
Something that grows in winter, and will be  
A verdant offering to my memory.  
And call it mine!"

"Sister—the young rose tree—  
That all the Spring has been my pleasant  
care,  
Just putting out its leaves so green and fair,  
I give to thee.

And when its roses bloom—  
I shall be gone away, my short life done;  
But will you not bestow a single one  
Upon my tomb?"

Now, mother, sing the tune  
You sang last night; I'm weary, and must  
sleep."

"Who was it called my name? Nay, do  
not weep,  
You'll all soon come!"

Morning spread over earth her rosy wings,  
And that meek sufferer, cold and ivory pale,  
Lay on his couch asleep. The gentle air  
Came through the open window, freighted  
with

The savoury labours of the early spring—  
He breathed it not. The laugh of passers by  
Jarr'd like a discord in some mournful tune,  
But marred not his slumbers. *He was dead.*

ANONYMOUS.

### REASONS FOR LEARNING TO SING.

The celebrated William Bird, the author of "*Non nobis Domine*," gave the following very forcible reasons for learning to sing, in a scarce work, published in 1598, entitled "*Psalms, Sonnets, and Songs of Sadness and Pietie*:"—First. It is a knowledge easily taught and quickly learned when there is a good master and an apt scholar. Secondly. The exercise of singing is delightful to nature, and good to preserve the health of man. Thirdly. It doth strengthen all parts of the heart, and doth open the pipes. Fourthly. It is a singular good remedie for a stuttering and stammering in the

speech. Fifthly. It is the best means to preserve a perfect pronunciation, and to make a good orator. Sixthly. It is the only way to know when Nature hath bestowed a good voice, which gift is so rare that there is not one amongst a thousand that hath it; and in many that excellent gift is lost because they want an art to express nature. Seventhly. There is not any music of instruments whatsoever comparable to that which is made of men's voices, when the voices are good, and the same well sorted and ordered. Eighthly. The better the voice is, the meeter it is to honour and serve God therewith; and the voice of man is chiefly to be employed to that end.—*Omnis spiritus laudet Dominum.*—*Musical Times.*

### FEMALE CULTURE.

The great entertainments of all ages are reading, conversation, and thought. If our existence after middle life is not enriched by these, it becomes meagre and dull indeed. And these will prove sources of pleasure just in proportion to previous intellectual culture. How is that mind to have subject matter of pleasurable thought during its solitary hours, which has no knowledge of the treasures of literature and science, which has made no extensive acquaintance with the present and the past? And what is conversation between those who know nothing? But on the one hand, what delight is that mind able to receive and impart, which is able to discuss any topic that comes up with accuracy, copiousness, eloquence and beauty? The woman who possesses this power, can never fail to render herself agreeable and useful in any circle into which she may be thrown, and when she is so, she cannot fail to be happy. A full mind, a large heart, and an eloquent tongue, are among the most precious of human things. The young forsake their sports and gather round, the old draw nigh to hear, and all involuntarily bow down to the supremacy of mind. These endowments add brilliancy to youth and beauty, and when all other charms are departed, they make old age sacred, venerable, beloved.

### IDLE DAUGHTERS.

"It is," says Mrs. Ellis, "a most painful spectacle in families where the mother is the drudge, to see the daughters elegantly dressed, reclining at their ease, with their drawing, their music, their fancy work, and their reading; beguiling themselves of the lapse of hours, days, and weeks, and never dreaming of their responsibilities; but as a necessary consequence of neglect of duty, growing weary of their drooping energies, and blaming their fate, when they blame God for having placed them where they are.

"These individuals will often tell you, with an air of affected compassion, (for who can believe it real?) that poor, dear mamma, is working herself to death.

"Yet, no sooner do you propose that they should assist her, than they declare she is quite in her element; and, in short, that she would never be happy if she had only half as much to do."

### EXCELLENCIES OF KNOWLEDGE.

There are in knowledge these two excellencies: first, that it offers to every man, the most selfish and the most exalted, his peculiar inducement to good. It says to the former, "Serve mankind, and you serve yourself;" to the latter, "In choosing the best means to secure your own happiness, you will have the sublime inducement of promoting the happiness of mankind." The second excellence of knowledge is, that even the selfish man, when he has once begun to love virtue from little motives, loses the motive as he increases the love, and at last worships the Deity, where before he only coveted the gold upon its altar.—*Bulwer.*

### A SPIRIT ABROAD.

A spirit is abroad—free, bold, uncompromising, and terrible as an army with banners—which is trying the opinions and institutions of the world as by fire. It is the duty of the wise and good to endeavor to guide this spirit, to restrain its excesses, and above all, to imbue it with a sincere love of truth, humanity, and God. But we fear not the issue. We believe that every accession of new light and intelligence will be found to illustrate and enforce the evidence of the Christian revelation, and give to mankind a much deeper and more living sense of its truth and of its reality.—*Walker.*

## Science and Practical Arts.

### TELEGRAPHS—ELECTRO-MAGNETIC TELEGRAPH.

Though the telegraph has been known and used by the moderns not more than half a century, it is not altogether a modern invention. From the earliest times men have known how to communicate with each other at a distance. Some sort of telegraph seems to have been in use amongst the ancient Greeks. It is said that the burning of Troy was known in Greece before any messenger could have conveyed the intelligence. Such communications, however, were confined to occasions of emergency—such as battles and civil commotions—and were made by means of fire signals. POLYBIUS speaks of the instruments employed by the ancients for telegraphic communications, and mentions improvements in them suggested by himself. But the language of torches was very limited and imperfect; and the beacon flames which arose from hill to hill over a whole landscape, could announce nothing more than the occurrence of some remarkable event—could give no definite information respecting it. Both in England, France, and Spain, during the seventeenth and eighteenth centuries, improvements were made in this mode of communication by the erection of poles or masts at convenient distances on the most elevated hills between different places, and the invention of an apparatus of characters consisting of moveable arms, the different positions of which stood as signs of words or letters of the alphabet, and were moved in all directions by a piece of mechanism contrived for that purpose. The first application of this kind of telegraph to practical purposes was in France in 1793. The first telegraph post was made by M. CHAPPE from Paris to Lille, a distance of 130 miles, and consisted of *twelve* telegraphs or stations. The conquest of Quesnoy (a fortified town near Lille) in 1794 was by this means communicated to Paris in an hour's time. A rapidity of communication wonderful at the time, but slow indeed in comparison of the speed with which news is transmitted by the electrical telegraph! The night telegraphic communications were made by illuminating the apparatus, or by a preconcerted disposition of lights. The British Admiralty has long made much use of this kind of telegraphs; and under its auspices several important improvements in them have been effected. But it is apparent how comparatively slow is this mode of communication; how often the state of the atmosphere must interrupt its operation; and how easily a blunder at any one of the many stations might occasion mistake.

Of quite a different character is the electro-magnetic telegraph, of which we propose to say a few words. The electric fluid travels one-third faster than the light itself; the speed of light being 192,000 miles in a second, while that of the electric fluid is 288,000 miles; thus in a single second of time travelling a distance of more than eleven times the circumference of our globe! This subtle, invisible fluid, the essence of which is entirely unknown to us, has been pressed into the service of man by the discovery and invention of modern science and art, and made the messenger of thought and affection from city to city and country to country with more than the swiftness of the solar rays. Here is incomprehensible mystery and indisputable fact inseparably conjoined. The former discredits the latter no more than the latter explains the former. Yet such an union scepticism has presumed to pronounce unphilosophical and irrational in a Book and System which treat not of the mechanical properties and powers of nature, but of the attributes and government of Nature's Architect and Ruler!

In the brief explanations to which these pages limit us, we will

remark upon some peculiarities of the fluid itself, and then upon the means by which it is generated and applied in the operations of the electrical telegraph.

Electricity is a term employed to describe the operations of a subtle elastic fluid which pervades the whole material world. The nature of this fluid is entirely unknown to us. It is only seen in its phenomena or effects—such as attraction and repulsion, heat and light, mechanical violence and shocks to the animal system. The term electricity is often applied to designate the fluid itself, as well as the science which unfolds its laws and phenomena. This fluid is readily communicated from one substance to another; but some substances are much better conductors of it than others. Metals are the best conductors of it; glass is one of the several non-conductors of it; that is the glass will not pass off the fluid from one substance to another. This is the reason why glass cups or tubes are placed upon the tops of the telegraphic poles for the wire to pass through in order to *insulate* the wire from the earth—the great reservoir of electricity. Earthenware cups or tubes are sometimes used—answering the same purpose as glass. Did the wire come into contact with any one supporting pole, the electric fluid would pass to the ground, and the electrical communication between two telegraphic stations would be interrupted. It is essential that the telegraphic wire throughout its whole length, (except at the two ends,) be completely *insulated* from the earth. Iron and copper being good conductors of electricity, explains the reason why wire made of one or the other is used as the line or channel of telegraphic communication. When iron wire is used (as has always been the case in England), it has usually been coated with zinc by a particular process, and thus received the name of galvanized iron wire. When copper wire is used (as was the case in the first telegraphs in the United States), it is covered with cotton thread, saturated with shellac, and then again, with a composition of asphaltum, beeswax, resin, and linseed oil. The copper wire weighed from 80 to 100 pounds per mile. It is now universally displaced by iron wire of a weight of 300 to 330 pounds per mile. This is single, or twisted, unprotected or galvanized. The advantages of the protecting coat are said to be counterbalanced by the loss of pliability and toughness; and good iron having stood the test of years, the naked wire is generally used. This is the wire used for the Canadian telegraphs. Its cost of this kind of wire in the United States is from 6 to 10 cents per pound.

But to return to the electrical fluid. This wonderful agent is excited either mechanically or chemically; and derives its name from the manner in which it is generated. When excited by *friction*, it is called *Machine* or *Frictional Electricity*; when excited by *heat*, it is called *Thermo-Electricity*; when excited by *magnetism*, it is called *Magneto-Electricity*; and when excited by *chemical* action, it is called *Galvanic* or *Voltaic Electricity* (or Galvanism), from its discoverers. This is the kind of electricity employed in the electrical telegraph. Dr. FARADAY, in a paper published a few years since, has ably maintained the identity of the different kinds of electricity,—their phenomena differing merely in the state and degree of intensity in the action of the fluid. Some of the peculiar phenomena of *galvanic electricity* are the power of producing an *electro-magnet*, which atmospheric or machine electricity has no power of producing for practical purposes; the flow of a continuous current, like a living stream, while machine electricity is sudden in the discharge and exhaustion of its power, like the explosion of a mine or the discharge of a cannon; the density which requires and is easily confined to a *continuous* conductor, while common electricity prefers dissipation in the atmosphere to

confinement to a long conductor, and leaps from one metallic conductor to another. It is therefore galvanic electricity alone which is adapted to the operations of the electro-magnetic telegraph.

Let us next inquire into the means by which this electricity is generated and applied in working the telegraph. This is twofold—the *Galvanic battery* and the *Electro-magnet*; the former the motive power of the telegraph, the latter involving the basis and merits of MORSE'S American invention.

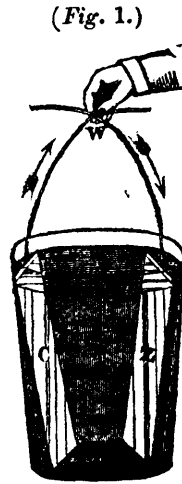
The Galvanic or Voltaic battery,—which is one of the most valuable acquisitions of modern science,—originated in GALVANI (an Italian anatomist of Bologna) having observed the contractions which ensue when a metallic communication is made between the *nerves* and *muscles* of a dead frog. He found, that, when a single metal was employed as a line of communication, contractions of the *muscle* took place wherever the metal reached from the *nerve* to the *muscle*; and that when two pieces of different kinds of metal (such as zinc and copper) were employed, the contractions or spasms were much more violent. To explain this effect, GALVANI supposed that the *muscular* system of animals is constantly in a positively electrical state, while the *nervous* system is negative; and that the muscular contractions were to be accounted for on the same ground that a discharge takes place in the case of the Leyden jar when a line of communication is opened between the two coatings in opposite electrical states. But another Italian philosopher, VOLTA, conjectured that the cause of this remarkable result was not due to any peculiarity of the animal system, but to the *contact* of the *pieces of metals* employed by means of the moisture of the animal. This led to the invention of the Voltaic (and as it is also called Galvanic) battery—an instrument which has proved of the greatest importance to chemical science. Thus the convulsive spasms of a frog's leg have, in the hands of true philosophy, already resulted in showing that the entire crust of the earth is made up of metallic oxides; have unfolded the mystery of the Magnetic Needle's pointing to the North; have developed the wonders and benefits of the Electrical Telegraph, and revolutionized the science of Chemistry.

The simplest form of galvanic action may be tested by any person, who will place a piece of silver or copper—half-a-dollar or a penny—above his tongue, and a piece of some other metal, as zinc, below the tongue. As long as the two pieces of metal are kept apart, no effect will be perceptible; but whenever their outer edges are brought into contact, so that what is termed a “galvanic circle” is formed by means of the moisture of the tongue, that moment galvanic action takes place, producing a peculiar taste in the mouth.

Three elements are essential to produce galvanic electricity. The process usually adopted to obtain it, is to plunge two plates of different metals—copper and zinc, for instance—into the same liquid—say diluted sulphuric acid. The acid will combine with the zinc and give it a negative electricity, and be itself positive. The copper being less liable to be acted upon by the acid than the zinc, will, instead of being negative, receive positive excitement from the intervening liquid, and will, when the circle is completed by uniting the two unimmersed ends of the plates by means of a wire, act as a conductor to carry round the positive current.

The simple galvanic circle is best illustrated by the accompanying *Figure 1*.

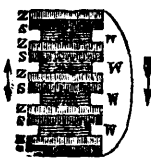
The vessel is partially filled with diluted sulphuric acid, with a plate of zinc, Z, and another of copper, C, immersed into it. The plates are separated at the bottom of the vessel, and the circle is



SIMPLE GALVANIC CIRCLE.

completed by connecting them on the outside by means of wires. Should the plates themselves be brought into contact on the outside of the vessel, instead of being joined by the wires, the same effect would be produced. Sulphuric acid having a stronger affinity for zinc than for copper, combines with it; and the zinc, communicating its natural share of the electrical fluid, becomes *negatively* electrified. The copper, attracting the same fluid from the acid, becomes *positively* electrified. Should therefore the plates, which are in opposite electrified states, be united by contact, or by the conducting rod W, a galvanic circle would be formed, and the electrical current would flow in the direction of the arrows; first from the zinc to the fluid, secondly from the fluid to the copper, and thirdly from the copper through the wires back to the zinc—thus passing from the zinc to the copper in the acid, and out of it from the copper to the zinc. The electrical effects of a simple galvanic circle—which are too feeble for practical purposes—may be increased to any degree by repeating the same simple combination—thus forming compound galvanic circles, which are called galvanic or voltaic piles or batteries, according to the manner of their construction.

(Fig. 2.)

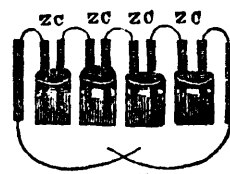


VOLTAIC PILE.

A voltaic *pile* is represented by *Figure 2*. It consists of several plates of silver (which is preferable to copper, though not equal to gold or platinum) and an equal number of zinc plates—each *pair* separated by pieces of woollen cloth, soaked in a solution of sal ammoniac in water. The order of these plates in the pile—as shown by the *Figure*, beginning at the bottom—is, zinc, silver, cloth, &c. The pile will afford a constant current of electric fluid, through any conducting substance, (such as the wire represented in the figure) proportioned in strength to the size and number of the pieces used. As the human body is a good electrical conductor, if one hand be applied to the lower plate of the pile and the other to the upper one, a shock will be felt, and will be repeated as often as the operation is renewed.

As the pieces of cloth between the silver and zinc in the pile of VOLTA are of no other use than to contain the acting substance, they may be dispensed with, and the same object may be attained by inserting the plates in a series of vessels containing the proper kind of liquid. VOLTA accordingly made an arrangement which he called the *couronne des tasses* (the crown of cups), which are represented by *Figure 3*.

(Fig. 3.)



VOLTA'S GALVANIC BATTERY.

This kind of galvanic battery is used in many of the intermediate stations of the telegraph lines. It consists of a row of glasses or jars filled with acidulated water, and each containing a couple of plates. Into the first is placed a zinc plate Z and a copper plate C. If these were connected, a current would arise, as was described in connexion with *Figure 1*. But instead of connecting these, let a wire pass from C to Z, a zinc plate in the second glass, which contains also a plate of copper connected with the zinc of the third glass, and so on with the fourth, and as many more as it may be thought proper to add in order to increase the power of the battery. The arrows denote the course of the electric fluid.

(To be concluded with additional illustrations in our next.)

## Literary and Scientific Intelligence.

### *Tubular Bridges for Railways—Remarkable Triumph of Skill.*

—The tubular bridges erected by Mr. Stephenson, upon the Chester and Holyhead line of railway, must remain for many years unsurpassed, as specimens of science and engineering skill. In Telford's celebrated suspension bridge over the Menai Straits, the problem was solved of constructing a safe pathway for the transit of heavy burdens. Perfect rigidity, both as regards the lateral oscillations produced by the passage of the enormous trains at high velocities, and the perpendicular undulations so perceptible in ordinary bridges built upon the suspension principle, has been obtained by forming the massive iron beam into a hollow rectangular chamber, 25½ feet high, 15 feet wide, and (in the Conway tube) 412 feet in length, in the inside of which the trains are to travel along the rails. It forms, in fact, a long gallery, whose sides are composed of iron plates half an inch thick, and its ceiling and floor are formed of compound plates, consisting each of two laminæ of metal, kept apart at a distance of about 21 inches, by a series of plates of that breadth extending the whole length of the tube, dividing the top and bottom strata into a series of longitudinal cells, and aiding greatly in the resistance offered to the weight of the passing trains. The whole mass of iron employed is sufficient to form a solid beam 412 feet long from pier to pier, and 46 inches or nearly four feet square. Employed in this form, the beam would possess ample strength; but it would have been drawn down by its own weight into a catenary curve, dipping several feet in the centre, and altering in shape upon the passage of a few tons along its surface; while even the action of a high wind would have impressed on it a considerable lateral or horizontal vibration. The same metallic mass distributed into the compound parts of the gallery we have described, was fashioned into a curve rising only 7 inches in the centre, which the action of its own weight (1,300 tons) drew, as was intended, into perfect horizontality; and which has been proved to sink not more than a single inch by the added pressure of a hundred tons. A number of ingenious contrivances were brought into use during the process of construction. The compound tube consists of many thousand separate pieces, with every joint secured by covering plates, and T angle irons, fastened together with rivets, all driven red-hot. In drilling the rivet holes, more than a million in number, a curious machine was used, imitated from that employed in making the perforated cards for Jacquard looms, by which the work was done with beautiful regularity. The foundations of the supporting piers are laid upon piles driven by Nasmyth's steam pile-driver—an engine which seems to have been invented just in time. The huge structure was floated from the temporary stage whereon it was built, upon caissons which the tide lifted; and was elevated to its destined place by hydraulic pressure. So extreme is the accuracy of this wonderful work, that the thermometric change of shape produced by an hour's sunshine upon one side, or on the top, becomes readily perceptible; and one end of the tube is left loose upon the abutment to allow for this expansion.—[From "The Progress of Mechanical Invention" in the Edinburgh Review.]

*The History of Mechanical Invention* is full of curious examples of the introduction of a new material, or the suggestion of a new combination of parts rendering easy the improvements that have baffled the ingenuity of man for generations. It would be a curious injury to trace how many contrivances have been delayed for years from the mere want of knowledge or skill to execute the works; and obliged as it were to lie fallow until the cunning of the workman could sufficiently correspond with the ingenuity of the inventor. When Hadley first constructed the quadrant still known by his name, for a long period it was perfectly useless in the determination of the longitude, as the indications could not be depended upon to a greater accuracy than fifty leagues. But after Ramsden had invented his "dividing engine," the graduation was so vastly improved, that even in the commonest instruments, an error of five leagues was seldom to be feared. The minute measurements of angular distances by the micrometer were long subject to similar difficulties. The instrument waited, as it were, for Wallaston's discovery of the means to procure platinum wire so fine, that 30,000 might be stretched side by side within the breadth of an inch. The limit which was reached by this discovery, was followed by another pause. Then came a new advance, owing to the beautiful invention of an eye-glass composed of double refracting spar, so mounted as to revolve in a plane parallel to the axis of refraction, and give, by the gradual separation of the two rays, a measurement susceptible of almost infinite delicacy. So in the history of the steam engine. Bolton and Watt had been long partners, and the theory of his great machine was almost perfect, when Mr. Watt still found that his pistons fitted the cylinders so ill, as to occasion considerable loss from leakage. In 1774 Mr. Wilkinson, a large iron master, introduced a new process of casting and turning cylinders of iron. Watt at once availed himself of them; and in a few months the inaccuracy of the piston "did not anywhere exceed the thickness of a shilling." The steam-chamber presents a sectional plan somewhat resembling

five pointed Gothic arches set round a circle; the outline being formed by ten segments of circles all referring to different centres. The piston has to traverse round this singularly-formed chamber, preserving a steam-tight contact at both edges; and such is the accuracy of the workmanship that the leakage is barely perceptible.—[Edinburgh Review.]

*The Progress of Mechanical Invention in England.*—When the first steam-printing machine was "working off" the impression of "The Times" newspaper at the rate of 2,500 copies per hour, the noise could be heard through the silence of early morning nearly across Blackfriars bridge. At present, conversation proceeds in the very room where the type-loaded frame, of far larger dimensions than heretofore, is travelling to and fro beneath the cylinders, and perfecting between 5 and 6000 double sheets in the same time. Dr. Cartwright describes the first powerloom as requiring the strength of two men to work it slowly, laboriously, and only for a short period. We may now enter a single apartment in a Lancashire mill, and see 250 looms at full work, each throwing 150 threads a minute; while a single shaft carried along the ceiling communicates motion to the whole, and with a noise by no means overpowering. In the manufacture of needles, the slender bars of steel are forged out by a succession of hammers, each one less in weight and quicker in stroke than its predecessor. As the motion of the hammer is necessarily alternating, the dislocating effects of its momentum when thrown into rapid vibration would be enormous, but for the contrivance of giving the hammer a double face, and causing it to strike every time it rises against a block of steel placed above, from which it is thrown back upon the anvil. The vibration is thus produced by a series of rebounds, between two opposing surfaces; five hundred strokes can be made in a minute, while the power is materially economized, and the strain upon the axle nearly annihilated.—[Edinburgh Review.]

*Discovery of the Great Winged Human-Headed Lion in the Ruins of Nineveh at Nimroud.*—In the morning I rode to the encampment of Sheikh Abd-ur-rahman, and was returning to the mound, when I saw two Arabs of his tribe urging their mares to the top of their speed. On approaching me they stopped. "Hasten, O Bey," exclaimed one of them—"hasten to the diggers, for they have found Nimrod himself. Walah, it is wonderful, but it is true! we have seen him with our eyes. There is no god but God;" and both joining in this pious exclamation, they galloped off, without further words, in the direction of their tents. On reaching the ruins I descended into the new trench, and found the workmen, who had already seen me as I approached, standing near a heap of baskets and cloaks. Whilst Awad advanced and asked for a present to celebrate the occasion, the Arabs withdrew the screen they had hastily constructed, and disclosed an enormous human head sculptured in full out of the alabaster of the country. They had uncovered the upper part of a figure, the remainder of which was still buried in the earth. I saw at once that the head must belong to a winged lion or bull, similar to those of Khorsabad and Persepolis. It was in admirable preservation. The expression was calm, yet majestic, and the outline of the features showed a freedom and knowledge of art scarcely to be looked for in the works of so remote a period. The cap had three horns, and, unlike that of the human-headed bulls hitherto found in Assyria, was rounded and without ornament at the top. I was not surprised that the Arabs had been amazed and terrified at this apparition. It required no strength of imagination to conjure up the most strange fancies. This gigantic head, blanched with age, thus rising from the bowels of the earth, might well have belonged to one of those fearful beings which are pictured in the traditions of the country as appearing to mortals, slowly ascending from the regions below. It was some time before the sheikh could be prevailed upon to descend into the pit, and convince himself that the image he saw was of stone. "This is not the work of men's hands," exclaimed he, "but of those infidel giants whom the Prophet, peace be with him! has said that they were higher than the tallest date tree; this is one of the idols which Noah, peace be with him! cursed before the flood."—[Nineveh and its Remains, by A. H. LAYARD, Esq., D. C. L.]

*Dr. Layard, the Explorer of the Ruins of Nineveh,* has been appointed a paid Attaché to the British Embassy at the Sublime Porte. It is stated by the *Literary Gazette* that "it is her Majesty herself (doubtless through the interest her Royal Consort takes in every concern of literature, science, and the arts) to whom Dr. LAYARD is indebted for his late promotion." The trustees of the British Museum have voted Dr. LAYARD the sum of £3,000, divided into two equal moieties, to be appropriated by him to excavations on and about the site of Nineveh in this and the ensuing year.

*Monument to the Author of the Seasons.*—A monument, in the form of a column, is about to be erected to the memory of JAMES THOMSON, the "poet of nature," at Richmond, either upon the far-famed hill or upon the terrace walk in Richmond Park. THOMSON died in Richmond, in Aug. 1748, and was buried in the church-yard. A brass tablet in the Parish Church alone denotes that the ashes of so distinguished a poet rest there.

*Science vs. Superstition.*—Science has gone down into the mines and coal-pits, and before the safety-lamp, the gnomes and genii of those dark regions have disappeared. But, in their stead, the process by which metals are engendered in the course of ages; the growth of plants which, hundreds of fathoms underground, and in black darkness, have still a sense of the sun's presence in the sky, and derive some portion of the subtle essence of their life from his influence; the histories of mighty forests and great tracts of land carried down into the sea, by the same process which is active in the Mississippi and such great rivers at this hour, are made familiar to us. Sirens, mermaids, shining cities glittering at the bottom of the quiet seas, and in deep lakes, exist no longer; but in their place, science, their destroyer, shows us whole coasts of coral-reef constructed by the labours of minute creatures; points to our own chalk cliffs and limestone rocks, as made of the dust of myriads of generations of infinitesimal beings that have passed away; reduces the very element of water into its constituent airs, and re-creates it at her pleasure. Caverns in rocks, choked with rich treasures shut up from all but the enchanted hand, science has blown to atoms, as she can rend and rive the rocks themselves; but in those rocks she has found, and read aloud, the great stone book which is the history of the earth, even when darkness sat upon the face of the deep. Along their craggy sides she has traced the foot-prints of birds and beasts, whose shapes were never seen by man. From within them she has brought the bones, and pieced together the skeletons, of monsters that would have crushed the noted dragons of the fables at a blow. The stars that stud the firmament by night are watched no more from lonely towers by enthusiasts or impostors, believing, or feigning to believe, those great worlds to be charged with the small destinies of individual men down here; but two astronomers, far apart, each looking from his solitary study up into the sky, observe, in a known star, a trembling which forewarns them of the coming of some unknown body through the realms of space, whose attraction at a certain period of its mighty journey causes that disturbance. In due time it comes, and passes out of the disturbing path; the old star shines at peace again; and the new one, evermore to be associated with the honoured names of Le Verrier and Adams, is called Neptune! The astrologer has faded out of the castle turret-room, and forebodes no longer that because the light of yonder planet is diminishing, my lord will shortly die; but the professor of an exact science has arisen in his stead, to *prove* that a ray of light must occupy a period of six years in travelling to the earth from the nearest of the fixed stars; and that if one of the remote fixed stars were "blotted out of heaven" to-day, several generations of the mortal inhabitants of this earth must perish out of time, before the fact of its obliteration could be known to man!—[London (Literary) Examiner.

*Death of Horace Twiss, Esq.*—We announce with regret, the sudden death of Mr. HORACE TWISS, a gentleman who for many years enjoyed a considerable reputation as a politician, a lawyer, and a literary man. Mr. H. TWISS was for many years a member of parliament, and filled a subordinate official position in the government of the Duke of WELLINGTON. As a parliamentary speaker he was impressive, and, as a politician, consistent. Mr. HORACE TWISS achieved considerable distinction in the literary world. His *Life of Lord Eldon*, although, of course, much of the interest lies in the original materials, is a biographical work of great ability and skill. He also contributed largely to the leading periodicals, especially the *Quarterly Review*. Many of the articles in the *Times* were attributed to him, and for some years he regularly wrote the summary of parliamentary intelligence which appeared in that journal.

*Death of Samuel Maunder, Esq.*—We have to announce the death, on Monday week, of this excellent man, and meritorious writer. Mr. MAUNDER was the brother-in-law of WILLIAM PINNOCK, (who married his sister,) and who was so justly celebrated for the course he opened and pursued with such ardour in regard to books for educational purposes. PINNOCK'S Catechisms will never be forgotten when education is treated of; and in their production MAUNDER was the true workman, to whom the youth of England were chiefly indebted for their instruction; and also for those of a historical kind, which were no less skilfully and admirably edited.

*Decomposition of Light by the Eye.*—A correspondent sends us the following:—"On closing the eyes, after having looked steadfastly at a sheet of white paper held in the sun for about half a minute, and covering them without pressure, to exclude extraneous light, (a silk handkerchief held in the hand will answer the purpose,) the figure of the paper remains visible for some time. At first it is generally white, and then gradually changes through the colours of the spectrum. All the colours are seldom seen at the same trial; and it rarely happens when one or more are missed that they afterwards appear. Thus, when the change is from green to red, yellow or orange are seldom seen. The change from white generally commences with a light indigo or blue, and terminates with red, or some compound of it—but sometimes with a deep blue or violet. The colours are generally seen at the edges of the figure first—though this is not always the

case; and when they once appear, they often remain mixed up with those that succeed. Many curious modifications and confused mixtures of colours will be perceived at times; but it seldom happens that the colours develop themselves, in the first instance, contrary to their order in the spectrum, although when the last has appeared they occur in various ways. This is a phenomenon which I have not seen noticed anywhere; and it would seem to arise from the retina decomposing the light that falls upon it, surrendering the rays in the order of refrangibility."—[Athenæum.

*Terrific Theory.*—Professor SILLIMAN mentions the fact, that in boring the Artesian wells in Paris, the temperature of the earth increased at the rate of one degree for every fifty feet, towards the centre. Reasoning from causes known to exist, he says:—"The whole interior portion of the earth, or, at least, a great part of it, is an ocean of melted rock, agitated by violent winds, though I dare not affirm it, is still rendered highly probable by the phenomena of volcanoes. The facts connected with their eruption have been ascertained and placed beyond a doubt. How, then, are they to be accounted for? The theory, prevalent some years since, that they are caused by the combustion of immense coal beds, is perfectly puerile, and is entirely abandoned. All the coal in the world could not afford fuel enough for a single capital exhibition of Vesuvius. We must look higher than this; and I have but little doubt that the whole rests on the action of electric and galvanic principles, which are constantly in operation in the earth."

*Beautiful Microscopic Appearance of Duckweed.*—Did those persons who are anxious to banish the Duckweed from their stagnant pools ever examine the stem of this little plant under the microscope? If not, I promise them a treat which will both astonish and delight them. In warm weather, and examined with a good light, they will find the beautiful campanularia, or bell-shaped animalcula, attached to the stem of the Duckweed in great abundance. This compound creature consists of a stem, branching in every direction like a bunch of grapes, the end of each branch terminating in a bell-shaped, living, and distinctly organized being. The edge of the bell is fringed with most delicate cilia, by which a current is kept up around the animalcules, and small particles of decomposing vegetable matter brought constantly within reach of its mouth. Do you doubt its life? Just touch the stand of your microscope never so gently, and in an instant, quicker than thought, every bell will shrink and collapse upon the stem of the Duckweed; and again, when the motion ceases, spread out their delicate and beautiful bells, to perform their destined duty—the purification of stagnant water, the preservation of human life.

*Etching and Engraving in Black Marble.*—An interesting feature connected with the manufacture of black marble, is the depicting, by the application of an acid, representations of figures, flowers, Egyptian hieroglyphics, and other objects upon a polished surface. The method employed in doing this kind of engraving is similar to that pursued with respect to copper—viz., by first tracing with wax or varnish upon the marble the object intended to be represented; then, when the preparation is perfectly set, with a point marking in the finer parts of the figure. It is then covered with an acid, which bites off the polished surface of the marble which was not covered with the preparation, leaving those parts which were covered standing in slight relief; the wax is then cleared off. Thus it will be seen that any one with a knowledge of drawing could practise this part of the art; not so, however, with regard to another style of engraving on marble, which I will mention, and which is peculiarly English, such productions from abroad being unknown. There is no preparation of wax, or application of acid used here, the entire process is done by gravers' points and diamonds, hence called the "diamond engraving." It must be observed, that for effect in this work the artist is confined to a most limited space—viz., from a black polished surface to a grey ground, the natural color of the marble before it is polished.—[The Builder.

*The Mystery of the Pyramids.*—It is remarkable that after some thousand years of ancient inquiry, and at least a century of keen and even toilsome research by modern scholarship, the world knows little more of the pyramids than it knew when the priesthood kept all the secrets of Egypt. By whom they were built, for what, or when, have given birth to volumes of researches: but to those questions no answers have been given worth the paper they cost in answering. Whether they were built by Israelite slaves or Asiatic invaders, for sacrifice or sepulture, or for both, or for the glory of individual kings, or for the memory of dynasties, or for treasure houses, or for astronomical purposes, or for the mere employment of the multitude—workhouses having probably found their origin in Egypt—or for the rough ostentation of royal power, all are points undetermined since the travels of Herodotus. But that they must have cost stupendous toil there is full evidence—the great pyramid covering 13 acres—exhibiting a mass of stone equal to six Plymouth breakwaters, and rising to a height of 470 feet, or 15 feet higher than St. Peter's spire, and 119 feet higher than St. Paul's. [Blackwood's Magazine.



## Editorial Notices.

**FREE SCHOOLS IN THE CITY OF TORONTO.**—The Public Schools of the Metropolis of Upper Canada, after having been closed for upwards of twelve months by the corporate authorities, have at length been thrown open *Free* to the public. After a year's unrestrained association together in the streets of the City, indulging in vice and profanity, the children are again admitted to the school-room to be placed under its moral and intellectual restraint sufficiently long, if that were possible, to counteract the evil effects of a twelve months' training in the schools of indolence and vice.

The City of Toronto, on the eve of repealing the Law by which she is enabled to exercise supreme Municipal control in adopting effective general measures for establishing a gradation of superior Schools rendered free of access to the thousands of her school population by the imposition of a trifling tax upon the whole property of the City, comes forward to test the experiment of Free Schools. It will be curious and interesting to note the difference in the effect of the operation of the *partial* and *universal* systems of popular Education on the school attendance of the Pupils. Last year, out of a school population of 5500, but 1678 are reported as having attended the Common Schools—and those only during six months of the year! While in the Town of Niagara, under the Free School system, with a school population of 668, 716—including pupils above the age of 16 years, &c.—are reported as having attended the Common Schools during the entire year. The contrast is striking; but it is the result of the operation of the same School Law in the two ex-capitals of Upper Canada during the same year.

We sincerely hope that, after trying the experiment herself, the City of Toronto may, as did Niagara, decide by a popular vote that the public peace and morals will be much better conserved by having her thousands of idle boys industriously and appropriately engaged receiving instruction in her hitherto empty school-houses than in contracting vicious habits in the streets and on the sidewalks of the City.

**THE APPORTIONMENT OF THE LEGISLATIVE SCHOOL GRANT FOR THE YEAR 1849**, has been notified to the District Superintendents and Chairmen of the Boards of Trustees of Common Schools in the various Cities and Incorporated Towns of Upper Canada, with two exceptions—the Town of Bytown and the District of Dalhousie. The amount apportioned to each District, City, and Town, entitled to receive an apportionment, will be payable, as usual, on the 1st of August next, to the District Superintendents and Treasurers of the Cities and Incorporated Towns, on the Warrant of His Excellency the Governor-General, at the office of the Honourable the Inspector-General, Montreal. Parties in whose favour the Warrants will issue will require, if they have not already done so, to transmit to their Agent in Montreal *two* Powers-of-Attorney—one to be lodged with the Inspector-General and the other to be retained by the Agent appointed. Personal application alone would obviate the necessity of this arrangement.

### EDUCATIONAL PERIODICALS, &c., RECEIVED.

#### THE SOUTHERN JOURNAL OF EDUCATION.

Knoxville, Tenn. U. S. pp. 20, monthly, \$1 per annum. Edited by S. A. JEWETT and S. S. RANDALL, Esquires.

There are two Educational Periodicals published at Knoxville, Tenn. The second we noticed last week. The one now under consideration is edited with much taste and judgment, and is well

filled with educational *materiel*—historical, statistical, and argumentative. S. S. RANDALL, Esq., late Deputy Superintendent of Common Schools in the State of New-York—a gentleman of very superior abilities, and long and popularly known in connexion with School affairs in that State—is the Corresponding Editor. The articles from his pen are written with much vivacity and force. We have much pleasure in transferring some of them to our columns. It is gratifying to witness the emulation of the Southern States to rival the progress and success of the Northern States in promoting popular Education and intelligence.

**THE STUDENT**, a Family Magazine and Monthly School-Reader.  
New-York: pp. 32, \$1 per annum. Edited by Messrs. PLUMAN, CALKINS, and PAINE.

This is a publication with which we are much pleased. It is admirably conducted, and is strictly what it professes to be—a *School Reader*. The selections are beautiful and highly appropriate; and each article is accompanied with a miniature pronouncing dictionary of the abstruse terms and words which occur in the lesson. The publication is divided into three parts—for the student, the general reader, and the young pupil. We have no doubt that the third part is a great favourite with the juvenile trio—the face of "*The old Man with a Staff*" beams so benignantly on the smiling group around him as he tells them the pretty little stories so interesting to the mind of guileless, happy childhood.

**SINCLAIR'S JOURNAL OF BRITISH NORTH AMERICA.**

Quebec: pp. 16, semi-monthly, \$1½ per annum. Edited by P. SINCLAIR, Esquire.

This is indeed a very cheap and very entertaining publication. Its *Sketches of Distinguished Men* form a new feature in Canadian periodical literature, and will prove highly attractive to the general reader. The selections evince correct literary taste.

**THE CANADIAN GEM AND FAMILY VISITOR**, a Literary and Religious Magazine. Toronto: pp. 28, monthly, \$1 per annum. Edited by the Rev. J. H. LEONARD.

This publication has entered upon its second year, and is very much improved in its appearance. Its articles are all of a high moral tone and generally very interesting and varied. Two views—north and south—of the Provincial Lunatic Asylum are given in the numbers issued this year. They were lithographed by Messrs. SCOBIE & BALFOUR, and serve to indicate, as the Editor remarks, the progress of Canadian art.

**WRIGHT'S CASKET AND PAPER** are excellent educational papers, published monthly at Philadelphia, at \$4 per annum. They are devoted to universal Education, the Education of Mothers, and the promotion of Home joys, &c. These subjects are ably advocated in these papers. Some of the articles we have transferred to our columns.

### ACKNOWLEDGMENTS—To the 22nd of June, inclusive.

Rem. for Vol. I. from R. Douglas, Esq., D. C.; R. E. Matheson, Esq., D. C.—for Vols. I. and II., from J. McFarlane, Rev. Wm. Case, Supt. Eastern District—for Vol. II., from Supt. Simcoe District (5 copies), Supt. Brock District, J. Armistead, Rev. J. Gemly (2), J. Rogerson.

\*.\* Back Numbers supplied to all new Subscribers. The 1st Vol., neatly stitched, may be obtained for 5s. All communications to be addressed to Mr. J. GEORGE HODGINS, Education Office, Toronto.

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