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THE  
JOURNAL OF EDUCATION

FOR THE PROVINCE OF QUEBEC.

EDITED BY THE HONORABLE P. J. O. CHAUVEAU, LL. D., D. C. L., MINISTER OF PUBLIC INSTRUCTION, FOR THE  
PROVINCE OF QUEBEC, AND P. DELANEY, ESQ.,  
OF THE DEPARTMENT OF EDUCATION, ASSISTANT EDITOR.

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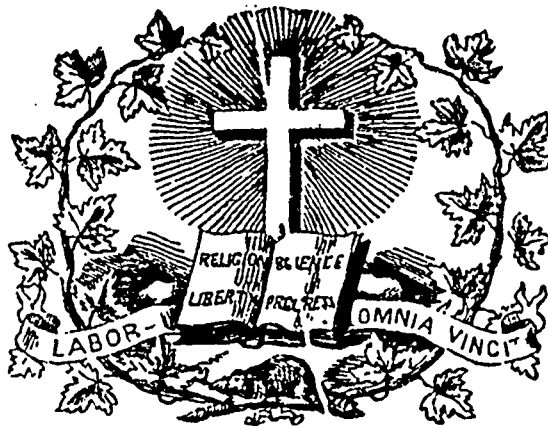


## TABLE OF CONTENTS.

- ADVERTISEMENTS.**—W. & R. Chamber's Educational Course, Reid, Macfarlaue & Co., Agents, Montreal, pp. 16, 32, 56, 72.—McGill Normal School, Montreal, p. 120.—McGill University, Montreal, p. 120.
- ARTS,** pp. 13, 14, 49, 70, 95, 153, 154, 155, 156.
- APPOINTMENTS,** pp. 7, 43, 61, 79, 110.
- BOARDS of Examiners,** pp. 7, 8, 24, 44, 61, 79, 110, 111, 112.
- BOOKS** Approved by the Council of Public Instruction for Lower Canada, pp. 45, 46, 47.
- COLLEGES,** pp. 89, 90, 91, 117.
- CAMPBELL, Mrs. A.,** p. 121.
- DIPLOMAS** Granted and Prizes distributed by Normal Schools, pp. 43, 79, 82, 83, 110, 114.
- DIPLOMAS** Granted by the Boards of Examiners, pp. 7, 8, 24, 44, 79, 110, 111, 112, 152, 153.
- EDITORIAL**—Legal Decision, p. 8.—Education in New Brunswick, p. 9.—Short School Time, with Military or Naval Drill; in connection especially with the subject of an efficient Militia system (continued from Dec., 1866), p. 10.—Filling Vacancies in School Boards, p. 24.—Notices of Books and Recent Publications, pp. 25, 62, 63, 118.—McGill University, pp. 25, 63, 64, 65.—St. Francis District Teachers' Association, Dec., 1866, pp. 26, 86.—Extracts from the School Inspectors' Reports, pp. 28, 29, 47, 48, 66, 67, 68, 69, 92, 93, 94.—School Provisions of the Canada Confederation Act, p. 45.—Payments in Silver, p. 45.—Books approved of by the Council of Public Instruction, pp. 45, 46, 47.—Meeting of the Teachers' Association in connection with Laval Normal School, pp. 47, 81.—*Dominion of Canada*, p. 62.—The Superintendent of Education, p. 62.—Proclamation by the Queen, p. 62.—Her Majesty and Confederation, p. 62.—Convocation of McGill University, p. 63.—Education in Nova Scotia, p. 65.—Return of Hon. Mr. Chauveau, p. 79.—Address to the Hon. Mr. Chauveau, p. 79.—Hon. Mr. Chauveau's Reply, p. 80.—The New Dominion, p. 80.—Thirty-first Meeting of the Teachers' Association in connection with the Jacques Cartier Normal School, Jan. 1867, p. 81.—Thirty-second Meeting of do. May 1867, p. 81.—McGill Normal School, pp. 82, 83, 84.—McGill Model School, pp. 84, 85.—McGill Provincial Association of Teachers, p. 113.—Education in Victoria, p. 112.—Death of Archbishop Turgeon, p. 113.—Presentation of Diplomas, p. 114.—Examinations and Distribution of Prizes at Laval University, p. 113.—Monument to an Historian of Canada, Oration delivered by the Hon. Mr. Chauveau, pp. 114, 115, 116.—Opening of the Session of Laval University, p. 116, 117.—Masson College, p. 117.—Teacher's Annual Convention, pp. 126, 127, 128.—Department of Public Instruction, p. 137.—To the Readers, p. 137.—Legal Decision, p. 137.—Education Department of the Paris International Exhibition, pp. 138, 139.—An Imperishable Unit of Length, (M.) pp. 139, 140.—Thirty-second Conference of the Teachers' Association in connection with Laval Normal School, p. 140.—Extracts from the School Inspectors' Reports, pp. 140, 141, 142, 143, 144, 153.
- EDUCATION.**—Progress, p. 4.—Physical Education, pp. 5, 37, 38, 39, 40.—Education in New Brunswick, pp. 9, 131, 132, 133.—Short School Time, &c., &c., p. 10.—On spelling, p. 21.—Best Method of Teaching Spelling, p. 23.—The Teacher a Student, pp. 33, 34, 35, 36, 37.—Means of Higher Intellectual Culture in Canada and England, p. 40.—Suggestions to Young Teachers, p. 41.—Evils of Change of School Teachers, p. 41.—A Stranger in the School, p. 57.—Individuality, p. 58.—Training of Girls, p. 58.—Education in Nova Scotia, pp. 65, 66, 130, 131.—The Drill-Muster, The Teacher, The Educator, pp. 75, 76.—Self Possession and Quietness in School-Government, p. 78.—Public Instruction in Sweden, p. 133.—Giving Joy to a Child, p. 76.—An Experience, p. 77.—Geographical Sketches, pp. 77, 78.—Model Composition, p. 78.—Drawing as an aid to Observation, p. 107.—Oral Instruction, pp. 107, 108.—A Model Primary, p. 108.—New and Useful Rules for Spelling, p. 109.—Anecdotes of Queen Victoria, p. 109.—Gilchrist Educational Trust, p. 129, 149, 150, 151, 152.
- EDUCATIONAL** Intelligence, pp. 12, 29, 49, 69, 70, 94, 118, 144, 156.
- EXAMINATIONS, &c.,** at the Universities, Colleges, Normal and Model Schools, and other Institutions of Learning, pp. 63, 82, 83, 84, 85, 89, 90, 91, 113, 114, 116, 117.
- EXTRACTS** from School Inspectors' Reports, pp. 28, 29, 47, 48, 49, 66, 67, 68, 69, 92, 93, 94.
- GEOGRAPHICAL.**—The Secrets of Sable Island, pp. 2, 17, 60, 77.
- HISTORY.**—Champlain and the Discovery of his Tomb, p. 58.—Historical References to Old Canada, p. 59.—Thirty years ago in Canada, p. 60.—The Campaign of 1760 in Canada, p. 60.—Red River Territory—Its Resources and Capabilities, p. 60.—An Incident of the Battle of the Plains of Abraham, p. 100.—Montreal in 1642, p. 101.—The Recollets in North America, pp. 102, 103.—Monument to an Historian of Canada, Oration delivered by the Hon. Mr. Chauveau, pp. 114, 115, 116.
- LITERARY** Intelligence, pp. 13, 29, 30, 49, 70, 118.
- LITERATURE.**—Beneath the Snow, p. 1.—Our Saviour and the Samaritan Woman at the Well, p. 33.—The Tambourine Boy, pp. 1, 2.—The Breath of Night, p. 2.—Going to District School, p. 17.—Twilight, p. 97.—The Poet's College Life with his departed Friend, p. 57.—Move on Little Beggar, p. 121.—The Reward, pp. 121, 122.
- LEPROHON, Mrs.,** pp. 1, 33.
- LONGFELLOW,** p. 97.
- MODEL SCHOOLS,** pp. 7, 24, 44, 83, 84, 85.
- MISCELLANEOUS** Intelligence, pp. 16, 32, 50, 72, 95, 119, 133, 134, 135, 136, 160.
- MONTHLY SUMMARIES,** pp. 12, 13, 14, 15, 16, 29, 30, 31, 32, 49, 50, 69, 70, 71, 72, 94, 95, 96, 118, 119, 120, 144, 156.
- METEOROLOGY,** p. 160.
- NORMAL SCHOOLS,** pp. 43, 47, 79, 81, 82, 83, 84, 110.
- NOTICES OF BOOKS,** pp. 25, 62, 63, 118.

NOTICES TO DIRECTORS, pp. 43, 61.	SCHOOL MUNICIPALITIES Erected, Divided, &c., &c., pp. 8, 24, 110.
NOTICES TO SCHOOL COMMISSIONERS, pp. 8, 43, 61.	SCHOOL COMMISSIONERS, pp. 7, 8, 43, 61, 110.
NOTICES TO SCHOOL TRUSTEES of Dissident Schools, pp. 8, 43, 61.	SITUATIONS WANTED, pp. 62, 112.
NOTICES TO TEACHERS, pp. 8, 43, 61.	SCIENTIFIC Intelligence, pp. 14, 15, 30, 31, 70, 71, 118, 144, 158.
NECROLOGY, pp. 16, 32, 49, 71, 95, 113, 119, 159.	SCIENCE.—The Metric System of Weights and Measures, pp. 5, 6, 7, 42, 43.—Observations of the Changes of Color and Modes of taking food in the Chamelcon, pp. 19, 20.—The Functions of the Blood, pp. 103, 104, 106.—Photography, p. 129.—Chemistry, p. 129.
OFFICIAL NOTICES, pp. 7, 8, 24, 43, 44, 61, 62, 79, 110, 111, 112, 136, 137.	SUMMARIES of the <i>Journal of Education</i> , pp. 1, 17, 33, 58, 73, 97.
OFFICIAL DOCUMENTS—Table of the Apportionment of the Grant for Superior Education for the year 1866, under the Act. 18 Vic. Cap. 54, pp. 50, 51, 52, 53.—Apportionment of the Supplementary Grant to Poor Municipalities, for the year 1866, pp. 54, 55, 56.—School Provisions of the Canada Confederation Act, p. 45.—The Dominion of Canada, Queen's Proclamation, The Superintendent of Education, Her Majesty and Confederation, Return of the Hon. Mr. Chauveau, Address to him on behalf of the Employees of the Education Office, Reply thereto, pp. 79, 80.—The New Dominion, p. 80.	STATISTICAL Intelligence, pp. 9, 12, 25, 26, 50, 51, 52, 53, 54, 55, 56, 61, 91.
PEDAGOGY, pp. 122, 123, 124, 125, 126, 145, 146, 147, 148, 149.	STATISTICS.—Apportionment of the Grant for Superior Education for 1866, under Act 18 Vict. Cap. 54, pp. 50, 51, 52, 53.—Apportionment of the Supplementary Grant to Poor Municipalities, for 1866, pp. 54, 55, 56.
POETRY, pp. 1, 2, 17, 33, 97.	TEACHERS' CONVENTIONS, &c., pp. 26, 27, 47, 81, 82, 86, 113.
PHELAN, Miss A. B., pp. 1, 2.	TRUSTEES, pp. 7, 8, 43, 61.
REPORTS.—Extracts from Inspector's Reports, pp. 28, 29, 47, 48, 49, 66, 67, 68, 69, 92, 93, 94.	TOPOGRAPHICAL.—The Rivers St. Lawrence and Saguenay, pp. 98, 99.—Japan and its Currency, pp. 99, 100.
	UNIVERSITIES.—McGill University, pp. 25, 26, 63, 64, 65.—Lennoxville (Bishop's College), pp. 87, 88, 89.





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No. 1.

**SUMMARY.**—*LITERATURE*—Poetry: Under the Snow, (by Mrs. Leprohon).—The Tambourine Boy, (by A. E. Phelane).—The Brough of Night, (by A. E. Phelane).—The Secrets of Sable Island, (to be continued).—*EDUCATION*: Progress.—Physical Education (a lecture by Mr. Barjum).—*SCIENCE*: The Metric system of Weights and Measures.—*OFFICIAL NOTICES*.—Appointments: School Commissioners and Trustees.—Diplomas granted by Boards of Examiners.—Erections, &c., of School Municipalities.—Notice to School Commissioners and Trustees.—Notice to Teachers.—Military Drill in the Normal Schools.—*EDITORIAL*: Logical Decision.—Education in New Brunswick.—Short School Time, with Military or Naval Drill in connection especially with the subject of an Efficient Militia System.—*MONTHLY SUMMARY*: Educational Intelligence.—Literary Intelligence.—Arts Intelligence.—Scientific Intelligence.—Necrological Intelligence.—Miscellaneous Intelligence.—*ADVERTISEMENT*: Chambers' Educational Course.

## LITERATURE.

### POETRY.

(Written for the *Journal of Education*.)

#### BENEATH THE SNOW.

BY MRS. LEPROHON.

'Twas near the close of the dying year  
And December's winds blew cold and drear,  
Driving the snow and sharp blinding sleet  
In gusty whirls through square and street,  
Shrieking more wildly and fiercely still  
In the lone grave-yard crowning the hill.

No mourners there to sorrow or pray,  
But soon a traveller passed that way;  
He paused and leant 'gainst the low stone wall,  
Whilst sighs breathed forth from the pine trees tall,  
Darkly looking on the silent crowd  
Of graves all wrapped in a snowy shroud.

Solemn and wierd was the spectral scene—  
The tombstones white with low mounds between—  
The awful stillness, eerie and dread  
Brooding above that home of the dead;  
Whilst Christmas fires blazed bright on each hearth  
And shed their glow upon scenes of mirth.

Silent the weary wayfarer stood,  
The spot well suited unto his mood,  
And severed friendships, bright day dreams flown,  
Thronged on his thoughts in that hour lone;—  
"Yes, happiness—hope," he murmured low,  
"All buried alike beneath the snow.

"Oh for the right to lay down the load  
I've borne so long on life's dreary road,  
"Heavily weighing on heart and brain,  
"And galling to both as convict's chain;—  
"No more its strain shall I tamely bear  
"But join the peaceful sleepers there."

His head on the old wall drooped more low,  
Whilst faster came down the sleet and snow,  
Sharply chilling the blood in his veins,  
Racking his frame with dull, deathlike pains;  
No matter, he thought, I'll soon lie low,  
Calm—quiet enough beneath the snow.

Ah! hapless one, thus thine arms to yield,  
When nearly won perchance is the field,  
After long struggling to lose at last  
The price of many a victory past,  
Of many an hour of keen sharp strife,  
Most nobly borne in the war of life.

But, hark! on high sound the Christmas bells,  
Of hope that to mourner their chiming tells,  
Of the sinless hours of childhood pure,  
Of a God who came all griefs to endure;  
And he sudden whispers, "Father, send,  
That I may be faithful to the end!"

#### THE TAMBOURINE BOY.

BY A. E. PHELANE.

Boy of the black eyes  
Whence do you come  
With chilly feet and hands,  
Thoughtless of kindred, heedless of home,  
A minstrel in many lands?  
You speak a strange speech, you sing a strange song,  
The song a mother may prize,  
But odd to ears that vainly long  
Your sweetest music to glean—  
Then tap the Tambourine!

The sun of a blue sky  
That bronzed your cheeks,  
And fired your soul with love,  
Still lives in your eye and boyish freaks,  
Though lost to you above.  
And you dance in the sleet of a snowy clime,  
And gambol low and high,  
Muttering words of an oddish rhyme,  
Touching to ears more keen—  
Then tap the Tambourine!

Then tap the Tambourine  
 And jingle bells,  
 That gladdened hearts may see  
 The joyous mood which plainly tells  
 Your guileless heart is free !  
 And let fair maids and stalwart youth  
 In lands of meadow green,  
 Welcome your childish Muse uncouth  
 Whose plainest note is o'en,  
 Tap, tap, the Tambourine !

Montreal, 19th January, 1867

### THE BREATH OF NIGHT.

BY A. E. PURTNEY

A mountain slept by a purple wood,  
 Its rock-ribs clad in haze ;  
 Flames on its crimsoned snow-top stood,  
 And danced in giddy mazes.  
 From out its breast a brooklet fled,  
 The silver tear a Giant had shed.

An oak watched by a wood-path drear,  
 Laughed with the wooing wind,  
 And tossed a bough to larch tree near,  
 Their friendship true to bind.  
 An eagle grim on high crag perched,  
 The valley's depth with quick glance searched.

Pinioned on air now Twilight came,  
 In robes of sober gray ;  
 Gold on her wings, her eyes a flame,  
 Star-browed to kiss the Day,  
 But lo ! the Night, eternal thought !  
 Breathed on the Mount and all was naught !

Montreal, 19th January, 1867.

### The Secrets of Sable Island.

(Continued from our last.)

Throughout all this flying trip not a stone is to be seen or a pebble of the size of a pea ; no trees, nor shrubs of scarce sufficient height to cast a shadow ; only a little withwood or low-spreading juniper. Yet the diversity is remarkable, and the scenes shift with the rapidity and freshness of a kaleidoscope. Here in one place is a long barren, shut in by hills, on which there is not a blade of grass visible. It is called the " Desert," and its sands are as desolate and as constantly shifting as those of Sahara. Standing within its dreary precincts one can give his imagination flight, and without time, fatigue, or money, spend a season on the wastes of Africa. Again " rub the lamp," give pony whip and spur, and in an instant we are transported to a Western prairie, whose rank grass rubs the horse's sides, and where grass and sky bound the horizon as palpably as in Texas ; and strange coincidence ! herds of wild horses roam as freely here as there, plunging through the billowy verdure, and scurrying away at the approach of man, just as if he and they had been forever strangers. Here, in secluded pastures, the wild mare suckles her foal, unsuspecting of danger, while the omnipresent stallion stands faithful guard on an adjacent eminence. Or, perchance, in the early evening twilight, some solitary outcast of the herd strolls down to an unfrequented spot on shore and stalks the lonely beach ; or leaning against some crumbling wreck, rumina- on the fickleness of fortune and the vicissitudes of this sublunary sphere. Once again, if we would entirely change the scene, a ten-minutes' gallop will carry us over the ridge and on the bank of the rippling lake, where, taking one of the quaintly constructed Island boats, with their broad floor and lofty stem and stern, a fair wind will dry the perspiration from the forehead and carry us a dozen miles down toward the other end of the Island. And if we should wish to go so far, a horse procured at Farquar's, at the East End Station, will take us to the very extremity, where the huge back-bone of the Northeast Bar stretches

far away to sea like a Giant's Causeway, bristling with wrecks for full five miles of its extent. Over it the spray dashes in showers, and forms little ponds in its centre, which empty themselves by miniature rivulets running back to the ocean. Here we find another House of Refuge like that at the West End. No one lives here, and it is only occasionally visited by the patrol, unless, perchance, some Vandal fishermen should land (as they have frequently done), and steal what philanthropy has provided for castaways. It is incredible that men exist so utterly devoid of humanity as to wantonly destroy or carry off those necessaries without which their fellowmen would die, and they have done this immediately after receiving the hospitality of the Superintendent's house. Sometimes there have happened hand-to-hand encounters between the honest wreckers and the fishermen, and for a time it was found necessary to take away every thing from the Houses of Refuge as soon as the fishing season commenced. Nevertheless the wrecked seaman will always find fire-wood and matches, with provisions and a few articles of clothing to supply immediate wants, and there are finger-boards and directions, printed in various languages, how to find water and inhabited houses. Truly the lone castaway who warms his benumbed limbs at this hospitable fire, and eats the food that has been provided, will ever have occasion to bless those generous Nova Scotians who founded this model colony, as well as those who have for years contributed to its support. Bread cast upon these wild waters will certainly return again.

Thus touching lightly, as the bee sips, we have traversed every part of Sable Island. Our illustrations faithfully portray its most interesting features, and show every building except those of the East End Look-out, which do not differ materially from the rest. Every foot of this singular territory is hallowed if not classic ground, made memorable by the great and good who are known to have perished there, as well as by the colonies of nameless dead who lie buried in its sands. Every grassy knoll or barren hill is distinguished by some dead man's name or old ship's tradition ; every grinning wreck is monumental. Here, in some barren spot, if we turn over the sand, we may find, as others have done, traces of some encampment of centuries past, where ancient coins, antique inkhorns, ornaments of fantastic design, knives made from iron hoops, rusty bayonets, and kindred relics are mingled with ashes and the bones of animals and men. An English shilling of the reign of Queen Bess, sharp as when sent from the mint, furnishes the date of the misfortune, but nothing is left to give a clue to the sufferers, who they were, except that they were Englishmen. There is a rotten strip of red bunting, and here and there an ancient shoe, worn by many a fruitless step to the eminence where the tattered rag waved long in vain for relief which never came ! Again, casually glancing up some sand-cliff lately caved away, we may discover curious strata of burned and decaying fragments etched in dark line across its face, or bits of wood and canvas projecting ; and, digging there, exhumed mementoes of another wrecked regiment which, like the " 43d," was cast away here when returning to Halifax after the siege of Quebec. Alas, how many strong men did battle with famine before the present Establishment was founded ! We might also gather from old housewife tales how, in 1820, the *Junco* drifted ashore without spars or rigging and with only one tenant, and he a dead man in the hold ; or how a gentleman and lady were found in the surf lashed to a broken mast. More than all this, if we are content to take assurances for facts, we might give credence to traditions of the old Vikings, who claim the Island's first discovery, or to semi-legendary history like that of the old regicide, who, it is said, hid, lived, and died here, and whose ghost every 29th of May (the anniversary of the execution of Charles I.) marches about the Island with a broad-brimmed hat on, carrying a drawn sword and singing psalms through his nose so loud as to be heard above the storm ! Again, could imagination supply the functions of the palate, we should in our brief tour have breakfasted, dined and supped with the reader on the abundant good things which the Island provides—

toothsome black ducks, dainty rabbit stews, fresh laid eggs, juicy clams and lobsters, or possibly a pony steak, which connoisseurs say is not bad, nor would fresh cod and mackerel or a slice of lean seal come amiss, topping off with ripe strawberries by way of dessert.

But this is all the sunny side of Sable Island life, and precious little of it there is too. Such halcyon days as these two which we have now enjoyed are as rare as a lunatic's lucid intervals. Even now there is a dull leaden haze thickening on the horizon, the sun wears a livid hue, and the surf begins to roll along the shore with a groaning, uneasy, and troubled sound—portending a gathering of the elements for strife. See! the cutter is already clawing off the coast. The old *Sea Dog* is weather wise, and means to keep the land on his weather side. Hope he will return in good time to take us off, and not leave us to vegetate for three months on the Island, as a certain doctor was left some years ago. We have no wish to turn wrecker just now. However, it is fortunate we are near old Farquar's house. We shall have shelter there and good entertainment. Here is the grizzled old fellow himself taking observations from his door-step, and carefully scanning the southern quarter, while his huge Newfoundland dog is just coming in with a seal which he had caught in the surf.

"Well, Farquar, how is the weather gage? Any chance of a storm?"

"Ay, ay, Sir, a storm! you may well say it! I've smelt it all day; and, mind! a private word to you—I dreamt last night of a wreck!"

This last remark in an undertone, and emphasized by the forefinger brought significantly to the temple.

"But come in, Sir. The fog is making fast, and we shall have it tooth and nail in an hour, blowing great guns. Come in, Sir, I say. A storm in these diggings is no trifle. I've no fancy for being out myself, and they do say (here a monitory tap upon the shoulder) there be such doings and carryings on as is not becoming the likes of us to behold!"

"We have heard stories of ghosts and strange noises at such times, Mr. Farquar."

"Whis! I've heard and seen them myself, but these are things not to be talked of above a whisper. Do you mind the wreck of the *Senator* down at the beach there? Well, I've seen lights there to come and go like the flash of a dark lantern, but devil a living creature within a good five miles of it."

"Very remarkable, Mr. Farquar!"

"You may well say it! More than that, I've seen the ocean on fire, Sir, and waves of flame leaping twenty feet high up between the sand hills! but it was only in places. Old man Darby has seen it too."

"Couldn't you tell us more particularly about some of these strange sights—these ghosts that blow horns, rattle chains, and walk about the Island at night?"

"Not for the Governor's salary would I breathe a word to a living soul. However, I might tell you of Lady Copeland's ghost. It's been in print, I believe, and there's no harm in speaking of it now, though it happened fore my time, and I can't swear to the truth on it, albeit there's folks now living in Halifax who knew well the parties concerned in it. Never heard of Lady Copeland's ghost! Well, sit you down here and take a pipe, while I go and get some hot stuff which will slush my tongue and help us to swallow the yarn the handier."

While old Farquar is gone the storm breaks in all its fury, not a gradually increasing gale, but suddenly, as though it had restrained and concentrated all its violence for a single instant which should puff the whole Island out of existence in an instant. None but an eye witness can conceive the horror and intensity of these storms. The whole Island rocks and trembles to its foundation. As far as the eye can reach the sea foams and drives like a snow-wreath in a whirlwind, while inland nothing can be seen but drifting sand and mist shutting in a narrow horizon of long grass tossing wildly and streaming in tatters from the wind-

swept hills. The combined artillery of contending armies is as nothing compared with the thunder of the breakers, and the flying sand rattles like hail wherever it strikes. No living creature can withstand the blast, and man must creep if compelled to go forth into the storm.

But all is snug within old Farquar's home. The stout timbers of his well-pinned house stand firm, and the blaze in the fire place is made more cheerful by the blast that shrieks in the chimney and whisks it spitefully up the flue. And now, seated on seal-skin cushioned stools before a hearth of glistening copper torn from a wrecked ship's bottom, warmed by flickering brands gathered from one wreck, and soothed by a cigar from another, we listen to Farquar's yarns, while many a carved memento and curious relic upon mantle, sideboard, and wainscot illustrate the startling tale, add emphasis to assertion, and conviction to truth.

"And now about Lady Copeland's ghost," the old man says, as he knocks the ashes from his pipe against his boot-heel. "She was wrecked, you know, on the *Amelia Transport*, sixty years ago, and Captain Torrens, of the *Twenty-ninth*, was sent out from Halifax to look after the wreck, for the talk was that it had fell into the hands of pirates, and all them that wasn't drowned was murdered. Well, as bad luck would have it, the Captain was wrecked too, and many of his soldiers went to Davy Jones, but he got safe ashore himself. After caring for them that was alive and burrying the drowned, he went off to take a look about the Island. When he came back and got to a shanty they called the 'Smoky hut' (which is torn down long ago), his dog began to growl and bark as if he was frightened at something in the hut, and looking in, what should he see but a lady in a white gown all wet and dripping with sand and sea-weed as if she had just been rolled ashore in the surf. Of course the Captain was startled to see the lady there, but he wasn't frightened one mite, for he was a brave man. So he goes up to speak to her, but she didn't answer a word, only held up her hand and showed the bleeding stump of her fore-finger. In a jiffy he ran for the surgeon's chest, and went up to her to dress the wound like a decent man, when what does she do but slip past him and streak it out of the door, and he all the time calling and begging her to come back. But she wouldn't mind him, and kept on running until she dove head foremost into the lake:

"What to do he didn't know, he was all taken aback so. And so he walks slowly back, thinking the matter over, and when he got back to the hut there was the same lady again holding up her finger as before! After looking steady for a while at her pale, wet face, he seemed to know her face, and finally remembered her name, for she was well known to the Halifax quality. 'Is that you, Lady Copeland?' said he. She bowed 'Yes,' and then held up her finger again. 'Ah! I see now,' said he, thinking it all over; 'the pirates murdered you to get the ring?' She bowed 'Yes,' again, and then the Captain swore to hunt the villain out and return the ring to her family. This seemed to please her, for she smiled, bowed and disappeared into the lake as previous. Well, would you believe it, the Captain tracked one of the most noted pirates down to the Labrador, made the acquaintance of his wife and family, who didn't know who he was, and, after asking some questions, he found that the ring had been left at a watchmaker's shop in Halifax to sell; and sure enough he found it there, bought it, and sent it home to the lady's friends as he had promised to do.

"Now, Sir, don't you believe there's such a thing as ghosts? There was the ring which the lady was known to have on her finger when she went aboard the vessel to go to her husband in Halifax, and the same ring was found as you have seen. It was all the talk in Halifax for years after. One thing is sure, the old pirate was never seen out after dark after the ring was found by the Captain."

Farquar was told that the incidents were certainly very extraordinary, and that facts which were so well authenticated could not be disputed; but this qualified assent to a belief in the existence of ghosts did not more than half satisfy him, and so



he talked no more on these topics. He contented himself with general remarks about the Island, how the sand was impregnated with gold, and that some gentlemen had once got permission to dig for it there; how the wreckers killed the seals and made oil, but that it was not very remunerative, because the seals were small and did not yield largely, how as many as 120 barrels of cranberries had been exported to Halifax in a single season; how they caught the wild horses, and all about the domestic economy of the Establishment. At length, with brain excited by the varied incidents of the day, the visitor retires to rest, rocked by the winds of a hurricane, with the deafening reverberations of the surf for a lullaby. But it is on the wings of such a storm that many a noble ship rides to destruction, and Farquar's dream of a wreck may prove true.

The ocean is superlatively grand after a storm. Before it was simply terrific; but now its full power is most sublimely felt, when the huge billows, no longer torn to shreds by the winds, sweep on its unbroken volume, gathering force by their own momentum, melting mountains by their touch and twisting planks and spars as if they were rushes. It is at such a time that the patrol mounts his hardy pony and starts forth upon his solitary mission of mercy, to look out for wrecks and render assistance, if needed, in saving life and property. Out into the earliest gray of the morning, murky with thick and flying mists, sturdily facing the blasts that almost sweep him from the saddle, he struggles on, scarcely making headway through the drifting sands and plashing pools. He rides up the central valleys, ever and anon mounting a knoll to look seaward where some old wreck, loosened from its fastenings, is knocking about in the breakers, and betimes plunging down to the beach to examine some dark object struggling in the land-wash—an iron-hooped cask, a spar crusted with barnacles, a hen-coop, or an empty bottle. Such tokens are all that he often finds, except perchance some whitening skull that the wind has laid bare and the rain washed clean; and so trudging on for miles, he at length discerns the figure of the south side patrol advancing through the mist. The two worthies meet, draw rein, compare notes, and then turn to retrace their steps and make their reports at Head-quarters.

(To be continued.)

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## EDUCATION.

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### Progress.

To elevate the standard of education, we must either induce scholars to attend school longer, or so change our system of instruction that they make greater advancement while they attend.

The latter I believe to be entirely practicable, and that we may not only teach much more in the ten to sixteen years that our boys and girls attend the common school, but we may have them graduate with a burning desire for knowledge that will lead them to read and investigate, as they travel the walks of life, until they rise much higher, and become much wiser and better men and women, than the present generation. And beside, many more will essay to cultivate their powers in the higher schools and colleges.

To do this we must introduce into our schools a system of instruction that will tend to encourage—instead of following the old system which tends to discourage—the spirit of inquiry and vivacity of mind that teachers find so common in children commencing school, and so seldom after a few years' attendance.

This is the first fruits of the word-method. The tyro begins to lose interest with the taxing of his memory to call the letters by name, and often loses all interest before he is able to pronounce words and read intelligently, by having tried to remember the great variety of different names these same letters take in the

pronunciation of words. Many persons are, however, ignorant of the fact that not twenty of the twenty thousand words of our language are pronounced exactly as they are spelled, i. e., by calling the letters in the pronunciation of the words the same as learned in the alphabet. But the tyro will not lose, but will progress with increased interest, if he be taught objectively, and *not required to remember* arbitrarily that for which he sees no reason. He remembers the names of his associates, acquaintances and objects, without an effort, because he associates, perhaps unconsciously, something of the form and expression of each with the name. And, if children are required to learn the orthography of words as the ripe scholar spells and pronounces,—*by the form of words*,—he will be more likely to retain the activity of mind he possessed prior to having his mind cramped by trying to remember arbitrarily that c-o-w spells cow, and t-o-w spells tow, &c.; whereas if his inexperience leads him not to notice the total want of analogy, he sees no chance for association, and is dependent wholly upon memory for the spelling of every word.

I have thought that, if we taught writing with the foot, holding the pen with the toes,—while attending school,—knowing that after we left school we must write with the hand, holding the pen with the fingers, we should be but little more inconsistent than we are to teach children, that the word originates from the spelling,—that certain letters make certain words,—and to build words, using letters as a material, as the builder builds houses, using bricks, mortar, &c.; and to compel every child to spend years of the best time in life for receiving truth and lasting impressions, in trying to remember that such and such letters make such and such words, when we know that in practice the form of the word dictates the spelling, which is to be performed entirely with the pen.

Again, if we never taught spelling except incidentally; i. e., if we expected the pupil to know nothing of spelling except from observing words in reading,—they would be much more observing than they are now. The ancients had no written science of Astronomy, but how much better astronomers were the common people than now!

The point I make here is, that to teach children to think is more valuable than to try, by cramming the memory, to make them scholars by storing the brain with isolated facts: the spelling of every word, by our system, has to be learned separately, to be called for afterwards, as the husbandman stores his grain in his granary, and makes drafts thereon afterward for every grist. For, in this matter of spelling, experience teaches that the memory of the student, filled at his graduation as full as the granary after harvest, becomes exhausted by forgetting, about as soon as the granary, by the drafts upon it; while, if, in place of memorizing the spelling of words, the student had always learned to reproduce with his pen the words he wished to use, he could not now forget the form of those words more than he would forget the countenances of his acquaintances.

The saving of time by stepping over the spelling lessons, and the advantage of always being able to produce the right form of the word you wish to use,—i. e., to spell correctly,—are less valuable to the man than the qualities of mind resulting from the habits of ever advancing, and constantly drinking in ideas, during that period of life in which he now spends weeks, months, and sometimes years, with little perceptible advancement, and no thought, except to determine how far he can transgress his teacher's rules, and not get a dose from Doctor Birch.

By this system, we should in a majority of cases have no dull scholars, and thousands who are now content to stud, only the three R's would become thorough scholars.

I do not contend simply for the word-method, but for anything that will produce a sensitiveness to impression, sufficient to make thinking, reasoning, acting men and women. As it is now, men develop almost by chance, while, if during all their lives they were more sensitive, they would oftener receive the impression teachers, preachers, parents, etc., design they should receive; and, consequently, become wiser and better during all coming generations.—By T. H.—*Massachusetts Teacher.*

### Physical Education.

Last night a lecture was delivered under the auspices of the Teachers' Association, by Mr. Barnjum, in the Normal School. The lecture was an exceedingly interesting one, was well and distinctly read, and listened to by an attentive audience.

The Chair was occupied by Principal Dawson, who called upon Mr. Gibson to open the proceedings by prayer. Mr. Dawson then introduced the lecturer, who after a few remarks went on to say. But the subject, Physical Education, is even as yet recognized more in its theoretical than in its practical aspect, in proof of which we need only look around at our educational establishments. In how many of them shall we find any provision for cultivating the bodily powers—very few. The majority leave the matter to the benevolent care of chance, and whether the people generally exercise or not depends upon their own dispositions. Is not our organization a talent committed to our charge, in order that we may improve it, that it may be perfected to its highest attainable point, and not wrapped up in the napkin of neglect? How otherwise can it be a fitting helpmate to the indwelling mind? Must not the two work in perfect accord, if we would attain a high degree of perfection in either—if we would obtain noble specimens of our race? Then why is it we persistently ignore the claims of the body to equal care and cultivation as the mind? It must be from want of consideration on the part of some, and with others by the homage which is everywhere accorded, and rightly so, to intellectual attainments, so much so, indeed, that people seldom stop to enquire at what an expense of suffering such attainments are too often purchased, of which how many instances are on record. Of noble youths who, having gained high academic honors, have found but a laurel wreath to deck their funeral bier; of others who have devoted themselves so much to their studies, to the utter neglect of their health, that they have become living martyrs, and finally sunk in the unequal contest. If, in the case of boys, this neglect of bodily culture is lamentable, what shall we say of girls who, by the conventional rules of society, are debarred from taking more than the semblance of exercise? They have not the same opportunity for romping as boys. Poor little missie must walk home in the most genteel manner possible, perhaps indulging in a softened laugh with some companion, her arms carefully hugged to her side, motion of the lower extremities only being permitted, added to which her poor little body is in all probability forced in by one of those instruments of death called corsets, binding up the naughty muscles that are begging and praying to be let loose and have an opportunity of strengthening themselves, and the young lady is considered to be in a highly satisfactory condition as she is pale and weak; but, no matter, it is the natural thing for girls to be weak. The lecturer then argued in favor of exercises conducive of health being put on a level with the so-called accomplishments. He said so far from this being the case, that all efforts were devoted to developing the mind only, and every method ransacked to discover how the brain may be stimulated, without pausing to consider that the mental and physical are so interwoven in our organization that one cannot be overtaken and weakened without disordering the other, and that a sound mind in a sound body is a positive necessity, wherever we would attain the highest results. He then went on to argue in favour of a knowledge of Physiology and Hygiene, and the happy results attending a thorough acquaintance with the same. In regard to the kinds of exercise, he said: To commence at childhood—that period when the plastic form is most amenable to influence of every kind—what should be our mode of action? and for these little ones I would, during the first period of their training, most emphatically protest against any exercise other than such as can be performed unaided by apparatus of any kind. After a time I would introduce light, wooden dumb-bells, and, if space permitted, wands. After a certain amount of dexterity had been attained with these, the ring exercises might be taught; which latter are of the highest value in strengthening the muscles of the abdomen and loins. In all these courses I would insist upon a proper alternation of marching exercises, of which the variety may be extended indefinitely. When practicable, all these exercises should be accompanied by music, not only because it is more pleasant, but for another and much more important reason, viz., that the strain on the nervous system is so immensely lessened, that an amount of work is gone through without any injurious fatigue, which would be impossible were the mind concentrated on the act itself during each movement. After boys had gone through these exercises, and their frames were developed, it would be proper to proceed to exercises on the fixed apparatus of the Gymnasium. The details of the exercises of the Gymnasium and their good results were then gone into, and were very interesting. As regards girls, he suggested the same kind of training for them as in the case of boys, excepting of course the fixed apparatus. I do not hesitate to say that any young lady placed under the care of an intelligent, well-educated teacher, cannot fail to

attain a degree of health which otherwise she never would have dreamed of. And I beg to remark that no person is competent to teach gymnastics, or to carry out physical education, who is not acquainted with Physiology and Anatomy. I have in common with others found that one great hindrance to carrying out successfully physical training, is that parents do not sufficiently regulate their children's diet, and the consequence is they come to their exercises heavy and debilitated. After some remarks on the bad habit so often acquired by boys in not expanding their chests, in regard to chest expanders he remarked, I need hardly say that all the ingenious inventions called chest expanders are worse than useless, do not cure the evil, but actually aggravate it. The lecturer then resumed his seat amid applause.

Mr. Gibson then made a few remarks, and moved a vote of thanks to Mr. Barnjum, and also that the lecture be published for the benefit of the public. Unanimously carried.

The meeting then adjourned.—*Monical Gazette*, Jan. 12.

## SCIENCE.

### The Metric System of Weights and Measures.

A PAPER READ BY MR. C. G. K. GUTHRIE, A. C. P., AT A MEETING HELD AT THE COLLEGE OF PRECEPTORS, LONDON.

In considering the various claims made upon us by society, it becomes an important part of our duty as teachers to keep pace, as far as possible, with the advance of practical knowledge, and to familiarize ourselves with such new facts as are most important to the general progress of the community whose rising members it is our office to prepare for an active life. I trust this admitted truth will serve me as a sufficient apology for bringing before you a subject which would at first sight appear to be of a commercial rather than an educational character. I have, however, but little doubt that we shall find abundant and interesting proof that the Metric System, upon which the most approved project for a reform of our weights and measures is based, has a decided claim on our professional attention. That such reform is much needed, there is but little occasion to prove; it is now of more importance for us to consider that the change to a more rational state of things is probably near, that the more widely and speedily society is prepared for it the better, and that there are few agencies more powerful for effecting this preparation, than those to be found in our schools.

Before entering upon a brief sketch of the history of the Metric System, our attention will be turned for a short time to the causes which render the present system objectionable; causes similar to those which have led to the abandonment, in nearly every country but our own, of the old scales, in favour of that now before us.

There are in existence at the present time eleven systems of weights alone, which are well known and extensively used in the British islands, under the sanction of law or of usage, either in science or commerce. Besides these there is a vast number of local denominations of a purely arbitrary nature, in connection with which there can be no attempt at classification. The result is, that not only is our home trade fettered by a complication of accounts most perplexing in their character, but in addition to this great evil, our foreign commerce is further impeded by the fact that none of these can be brought into harmony with the system used abroad; so that many difficulties continually arise, and much time is lost, by the compulsory use of the long tables of weights and measures, which are viewed with such well-grounded horror by the schoolboy, and lose little of their repulsiveness on a more practical acquaintance. A powerful example of the inconvenience referred to was furnished by the Great Exhibition of 1851, whose advantages were to a large extent thrown away upon thousands of visitors, even of the more enlightened classes, who could well appreciate its scientific, mechanical, and artistic attractions, but, for want of power to translate the foreign denominations, were unable to grasp its more important commercial features. Similar causes, arising from the great varieties of weights and measures, rendered the task of the jurors one of Herculean magnitude, since, to adjudicate with accuracy, a reliable common standard was in most cases indispensable for the purpose of comparison. Prompted by these and a hundred considerations, the Society of Arts memorialised the Government in favour of a uniform system, at the same time specially urging the advantages of the international principle. In 1853, the Statistical Congress at Brussels deliberated on the same subject. The inconveniences of the London Exhibition were repeated at Paris in 1855, and

called forth renewed complaints. The opinions thus set forward were endorsed by Prince Albert at the London meeting of the International Statistical Congress; and in 1861, the Associated Chambers of Commerce, including representatives of the most influential towns and the most important branches of industry, unanimously passed the resolution "That it is highly desirable to adopt the Metric System, which has been introduced into many European countries with great advantage to the saving of time in trading and other accounts." I will not stop to enumerate the men of scientific and commercial celebrity who have borne similar testimony; a few examples will suffice. In a memorial on Decimal Weights, presented to the Chancellor of the Exchequer by the International Decimal Association in 1859, it is stated, on the authority of the official returns, that 72 per cent. of our merchant navy was in 1857 (three years before the French treaty of commerce) engaged in transactions more or less dependent on the Metric System; this, of course, including vessels of every size and capacity; and in 1861 the declared real value of goods exported from the United Kingdom to countries using the Metric System in whole or in part amounted to nearly one-half the total value of all our exports. It was stated in evidence that the estimated saving to a single railway company, by the employment of a decimal system, would be 10,000*l.* per annum, and several merchants estimated their probable annual saving in amounts varying from 500*l.* to some thousands. Sir Rowland Hill notes many complexities in postal arrangements which arise from the difference between our system and that in use on the continent. With regard to all other countries except our own colonies and America, special weights are required in the Post Office. Since this evidence was given, the latter country has been removed from the list of exceptions, the Metric System having been adopted in the United States by a recent act of Congress. Passing to scientific matters, it may be observed that the Metric System has been almost universally adopted by chemists in their scientific papers, on account of its intrinsic advantages no less than its wide application throughout the world. The eminent chemist, Professor Hofmann, who has recently published a text book of Chemistry, has even introduced into his work a sketch of the Metric System, in the opinion that this study is much facilitated by the application of the decimal scale in calculations of atomic value, combining proportion, volume, and specific gravity. Professor Hughes, the distinguished geographer, remarks, that in the scale on which our maps are constructed, we are isolated from the community of nations; since, in all the countries of continental Europe, the scale bears a decimal ratio to the actual measure of the earth's quadrant. The value of all maps, he says, would be largely increased if a uniform principle of decimal measurement were employed in their construction. The Registrar General for the City of London strongly recommends the use of the Metric System, and adopts it in his official returns. It will be found introduced into nearly all recent text-books of arithmetic. I have here given only a very few instances out of many to the same effect, which may be found in the Report of the Parliamentary Committee on Weights and Measures which sat in 1862, and in the publications of the International Decimal Association.

The Metric System of Weights and Measures owes its rise to the earlier days of the great French Revolution, when a commission of scientific men was formed for the purpose of deciding upon a reliable unit of measurement. A formal invitation was forwarded to the British Government, with the view of procuring the co-operation of the Royal Societies of London with the French Academy of Sciences, that by the united labours of their members, the length of the seconds' pendulum at a given latitude might be accurately determined, and form an invariable model for an international system of measures, and hence for weights. The state of our continental relations at this time (1790) rendered it impossible to accept this proposal. The National Assembly, however, continued its effort in this direction at home; and having caused copies of all the standards used in the several communes to be forwarded for the consideration of the Academy, received in March of the next year a report on the most desirable unit, which contains the following highly creditable reflexion: "The Academy has endeavoured to exclude every arbitrary condition, everything which might lead to a suspicion of partiality for the interests of France in particular; it has desired, in a word, that if only the principles and details of this operation could be transmitted to posterity, it should be impossible to guess by what nation it was ordered and carried out. The operation of the reduction of measures to uniformity is of such great utility, it is so important to choose a system which will suit all nations, the success depends so much upon the universality of the bases upon which this system is supported, that the Academy has concluded that it is not possible to refer to measures already in existence, nor to be contented with the simple observation of the pendulum." Following this resolution, the number of sources of measurement was reduced to three: the second pendulum, the quadrant

of the equator, and the quadrant of the meridian. Of these, the first was rejected for the reasons stated above, and the second as affording fewer facilities for accurate measurement than the third, which was therefore adopted by decree of the Assembly. Two eminent mathematicians, Méchain and Delambre, were then entrusted with the execution of a measurement of the meridional arc from Dunkirk to Barcelona; a task which was accomplished after many remarkable obstacles, surmounted by the indefatigable ardour of these true men of science. Meanwhile the French nation was prepared for the contemplated change by an Act passed in 1793, establishing the decimal system of weights and measures, based upon the *mètre provisoire*, an approximate unit deduced from the previous measurement of a meridian by Lacaille. At length, in 1798, Méchain and Delambre presented their report, which was followed by a law establishing the new metre as the definite unit, in place of the temporary standard. A copy of this final base was prepared in platinum, and deposited in the national archives on the 22d of July, 1799. From this all standard metres throughout the world have been derived; but the new system was considerably delayed in its progress by an unfortunate attempt to effect a compromise with the old nomenclature. Its operation was still further retarded by an equally unsuccessful plan for introducing the principle of duodecimal subdivision. Finally, yielding to the strong pressure of the more enlightened sections of the people, the Government of Louis Philippe, by a law enacted in July, 1840, restored in its entirety the metric system with all the divisions as originally established in 1795. This law, which came into force on the 1st of January, 1840, still exists; and the system has since that time rapidly extended the area of its adoption. It had been legal in Holland from 1812, and in Belgium and Greece from 1836: and it is now in use in Spain, Portugal, and their colonies, in nearly all the South American States, and the greater part of Italy, while it bears a modified form in Switzerland, Germany, and Denmark. Scientific men and public as well as private engineers have long employed it extensively in Sweden, Norway, and Russia, as well as in Great Britain; by an Act of Parliament of the year 1864, it was permissively legalised here; and in the present year the United States, after avowedly waiting in vain for England (as Russia does now,) have established it as the legal system for the future.

In our own country, as in others, a vast amount of inconvenience has been felt from the incongruous nature of the numerical elements of which our tables are made up; and many projects have from time to time been advanced, recommending the adoption of various units, as the foot, the inch, the fathom, and others entirely new, the fruit of special theories and calculations. It is worthy of remark, that as regards subdivisions and multiples, the decimal ratio has received by far the greatest amount of favour from the designers of the various systems proposed. Many of these have been collected and compared under the auspices of a society composed of leading men of science and commerce belonging to several nations, and including official representatives of most of the European Governments. This society, formed in 1855, under the presidency of Baron James de Rothschild, is called the International Decimal Association. It has branches or representatives all over the world, and has been actively engaged since 1855, in the advocacy of the two principles expressed in its name. The first step in their proceedings was the consideration of the best unit of length. Their extensive inquiries led them to the conclusions that a unit already in use would be preferable to any as yet untried; that it should have a philosophical authority, admitting of accurate verification; that it should be of universal rather than local value; and that its dimensions should be such as to admit of easy manipulation, to allow convenient multiplication and subdivision, and to be readily appreciated by the eye. The seconds' pendulum was necessarily excluded from their recommendation, on account of the fact that its length not only changes in different latitudes, but varies even in the same place under the modifying influences of atmospheric and other conditions not subject to the control of observers. The metre alone appeared to possess the qualities considered desirable. It has been tested by extensive usage, not only in France, where it first appeared, but in many other lands, in which it is still employed: (and here it may be observed, that no country having once adopted it, has abandoned it, or failed to derive extensive advantage from its use;) its original source was one to which no exception can be taken on the score of national partiality; its standard exists in numerous copies, of unquestioned accuracy, as well as in the prototype, which has remained unaltered since its adoption in 1793, its size is such that it may be easily used when, as in measuring textile fabrics, both hands have to be stretched to the ends of the measure; while even its thousandth part is a quantity readily perceived and remembered by the eye.

The question of next importance was the scale of the multiples and subdivisions of the unit. There seems to have been no question but that a constant ratio should exist between them; in other words, that

the denominations should form a geometrical series ; but there have been many advocates of the duodecimal rather than the decimal scale, as admitting of a greater number of subdivisions. On this point it is urged that the decimal notation is naturally employed by all mankind in common arithmetic and that the employment of the same scale in commercial tables furnishes a most valuable harmony, not to be attained by any other way ; one of the great excellencies of the decimal system being, that not only are the relations of the several denominations simplified to the greatest possible extent by this uniformity of ratio, but all calculations relating to concrete quantities can be effected by the operations of pure arithmetic.

In striking contrast with this admirable simplicity is the complex arrangement of the many tables with which our text-books are crowded. So great is the difficulty found in fixing these in the memory of children, that an opponent of the Metric System, himself a teacher of some eminence, gravely propounded the theory, that it would be better to defer the learning of tables until the pupil's entrance upon office work, when he would soon learn by necessity and practice the special table required for his particular business. This ingenious writer cuts the Gordian knot by deciding that the boys should not be bothered at school by toiling through these very tables, which will afterwards come to him with such rapidity and ease when they are wanted ; but he does not tell us where to find men of business willing to give office-room to boys trained on this principle. Let us take a rapid survey of the chaos of names and factors we are at present compelled to employ, that we may the better judge of the reasons which have tempted him, and perhaps many others, thus to put off the evil day. We shall find two sections where we can at least classify the difficulties here presented ; the first including those relating to variety of multipliers ; the second, those arising from the use of different measures bearing identical names. Thus, in the first place, supposing the pupil commits to memory only the most common tables, those of Long Measure, Avoirdupois Weight, and Troy Weight, he encounters in these the five prime numbers, 2, 3, 5, 7, 11, in various and irregular combinations, in connection with which no reason whatever can be assigned, or association suggested, which will fix their relations in his memory. Analysing the table of Long Measure, we find (omitting the obsolete barleycorn) the first multiplier 12 ( $2^2 \times 3$ ), then 3, then  $5\frac{1}{2}$  ( $2^2 \times 5$ ), then 40 ( $2^3 \times 5$ ), then ( $8 \times 2^3$ ). Troy Weight gives ( $2^3 \times 3$ ), then ( $2^2 \times 5$ ), then ( $2^2 \times 3$ ). Avoirdupois Weight has ( $2^4$ ) twice, then ( $2^2 \times 7$ ), then ( $2^2$ ), then ( $2^2 \times 5$ ). Turning to measures of capacity, we find Liquid Measure occupying two tables, that for wine and that for malt liquors. The former gives the factors  $2^2$ , 2,  $2^2$ , up to the gallon, after which we have 63 ( $3^2 \times 7$ ), making the hogshead. Between these come the anker of 10 gallons, the runlet of 18, and the tierce of 42. In ale measure there seems a nearer approach to regularity ; and dry measure is the most regular of all, being almost purely binary. Wool Weight furnishes another prime number, 13 ; so that, oddly enough, whether by accident or design, our system includes the first 6 of the series of primes. These examples show, to a small extent, how vain it is to attempt fixing our present denominations in the minds of the young by any process beyond that of learning by rote. In order to save time, I have chosen only the tables most widely used, omitting several which it is generally considered expedient to teach to beginners. Even in these it will be seen that there is a measure of one capacity, 36 gallons, bearing two names, runlet and kilderkin ; and a name, hogshead, given to two different measures, of 63 and 54 gallons respectively.

(To be continued...)

## OFFICIAL NOTICES.



### APPOINTMENTS

#### SCHOOL COMMISSIONERS.

His Excellency the Administrator of the Government in Council was pleased, on the 15th December, 1866, to make the following appointments of School Commissioners :

County of Gaspé—Douglstown : Rev. Mr. Winter.

County of Two Mountains—St. Joseph du Lac : Mr. Jean-Marie Dargon dit Lafrance, fils.

County of Temiscouata—Trois Pistoles, N<sup>o</sup>. 1 : Rev. Jean-Baptiste Gagnon, Priest.

County of Dorchester—Ste. Marguerite. Messrs. Jean-Baptiste Drouin and Pierre Mabon.

County of Maskinongé—St. Paulin. Mr. Jean-Baptiste Lafond, père.

County of Wolfe—South Ham. Messrs. Samuel Porter, William Thompson, Jr., Joseph McKay, Joseph Dion, and François-Xavier Robitaille.

County of Champlain—St. Luc. Mr. Olivier Frigon.

County of Lotbinière—Ste. Émilie. Mr. Victor Benudet.

County of L'Islet—St. Roch des Aulnets. Mr. Pierre Pelletier (fils de Jean-Baptiste Pelletier), Jean-François Pelletier, Michel Caron, Edouard Pelletier and Germain Pelletier.

County of Joliette—St. Côme. Messrs. Elie Brault, Joseph Mirault, Jules Gaudet, François-Xavier Landreville and Jules Fafard.

His Excellency the Administrator of the Government in Council was pleased, on the 20th December, 1866, to make the following appointment of School Commissioners :

County of Temiscouata—St. Jean de Dieu : Rev. François-Xavier Guay and Messrs. Thomas Rioux, Joseph Boucher, Cyrien Couturier, and Thomas Côté.

#### TRUSTEES OF DISSIDENT SCHOOLS.

His Excellency the Administrator of the Government was pleased, on the 13th December, 1866, to make the following appointment of a Trustee of Dissident Schools :

County of Shefford—Granby : Mr. William Farley.

His Excellency the Administrator of the Government in Council was pleased, on the 15th December, 1866, to make the following appointment of Trustees of Dissident Schools :

County of Napierville—Napierville. Messrs. Louis Marceau, James Manning and John York.

#### DIPLOMAS GRANTED BY BOARDS OF EXAMINERS.

##### BOARD OF EXAMINERS OF RIMOUSKI.

1st Class Elementary, F.—Luc Montreuil and Mathildée Michaud.

2nd Class Elementary, F.—Virginie Ancil, Oubline Côté, Joséphine Gaudreau and Henriette Pelletier.  
November, 1866.

P. G. DUMAS,  
Secretary.

##### BOARD OF EXAMINERS OF AYLMER.

1st Class Elementary, F.—Stéphanie Hotte, Catherine O'Neil, Christopher Draffin and Joseph Stassardt.  
November, 1866.

JOHN R. WOODS,  
Secretary.

##### BOARD OF EXAMINERS OF SHERBROOKS.

1st Class Model School, E & F.—Elise Larivière.

1st Class Elementary, E & F.—Agnes Blondin, E.—Belinda Ross, Sarah C. Rankin and Joseph A. Rankin.

2nd Class Elementary, E & F.—Fanny E. Lindsay ; E.—Betsey J. Wilder.  
November, 1866.

S. A. HERD,  
Secretary.

##### BOARD OF EXAMINERS OF RICHMOND.

1st Class Elementary, E.—Janet Dickson Main, Sarah Maria Main, Nancy Webb, Adeline Emerson Stevens, Sarah Johnston, Sylvia Ann Taylor, Rose Malvena Morrill, Huldah Emma Morrill : F.—Adelphine Robidon, Adelphine Descôteau, Carmel Pothier, Marie Delvina Morin and Marie Dargis.  
November, 1866.

J. H. GRAHAM,  
Secretary.

##### BOARD OF PROTESTANT EXAMINERS OF MONTREAL.

1st Class Model School, E.—Mary Hardgrave Walsh.

1st Class Elementary, E.—Jane Ann McFee, Harriet McGarry, Margaret Rodger, Mary Sommerville and Charles H. Sawyer.  
November, 1866.

T. A. GINSON,  
Secretary.

##### BOARD OF CATHOLIC EXAMINERS OF MONTREAL.

1st Class Elementary, F.—Justine Bélanger, Philomène Cheuet, Azilda Demers, Virginie Desilets, Arthémise Drouin, Eliza Dufresne, Caroline

Gaudry, Alphonsine Ginetet, Marie Amédée Godin, Marguerite Hotte, Matvina Jasmin, Alphonsine Lagace, Vitaline Laurin; *E.*—Margaret McDonell, *F.*—Josephine Payant, Marie de Lima Provost, Adeline Sauvour; *E.*—Anna Taugher

*2nd Class Elementary, F.*—Madame Simon Hotte, *née* Philomène Raza; Denis Bourbeau and Léon Forest; Judith Bessette, Arzèle Blanchet, Justine Elodie Fontaine, Vitaline Langelier, and Adolphe Forget. *E.*—Jean-Baptiste Priou.

November, 1866.

F. X. VALADE,  
Secretary.

BOARD OF CATHOLIC EXAMINERS OF QUEBEC.

*2nd Class Elementary, F.*—Enphémie Wilhelmine Boulet.  
November 6, 1866

*2nd Class Elementary, F.*—Maurice Philomène Olympia Clavel, *E.*—Mary Meagher.

November 20, 1866.

N. LACASSE,  
Secretary.

ERECTIIONS, &c., OF SCHOOL MUNICIPALITIES.

His Excellency the Administrator of the Government has been pleased, by an Order in Council of the 18th December, 1866, to erect the last six Ranges of the Township of Catcart, in the County of Joliette, and the first two Ranges of the Township of Cartier, in same County, into a municipality for school purposes, by the name of the *Municipality of St. Côme*.

His Excellency the Administrator of the Government in Council was pleased, on the 20th December, 1866, to erect that portion of the *Canton de Begon* lying east of the River of Trois Pistoles, into the *School Municipality of St. Jean-de-Dieu de Begon*, in the County of Temiscouata, bounded as follows: on the north, or front, by the fourth Range of the Seigniorship of Trois Pistoles; on the east, by the 3th, 6th and 7th Ranges of said seigniorship, and by the unsurveyed Crown lands, on the south, by the *Canton Randot*, and on the west by the River Trois Pistoles.

NOTICE TO SCHOOL COMMISSIONERS AND SCHOOL TRUSTEES.

School Commissioners and Trustees of Dissident Schools are requested to transmit to this Office, as in duty bound, the names in full of all persons elected by the Ratepayers to fill places connected with the Public Schools in Lower Canada, together with the date of each election, whether such election took place during the month of July or at any other time. As this information is indispensable, parties not complying with the present Notice will be deprived of the grant.

NOTICE TO TEACHERS.

Teachers' signatures attached to Semi-Annual School Reports, should invariably correspond with their names and surnames as given by them to the Secretary of the Board of Examiners from which they obtained the diplomas authorizing them to teach in the Public Schools of Lower Canada. Non-compliance with this Notice may, in every case, occasion the payment of the grant to be delayed, or the grant to be withheld.

MILITARY DRILL IN THE NORMAL SCHOOLS.

His Excellency the Administrator of the Government has been pleased, by an Order in Council of the 20th December, 1866, to sanction the following Regulations adopted by the Council of Public Instruction for Lower Canada, at a special meeting held on the 20th November, 1866, in relation to the teaching of Military Drill in the Normal Schools, as also certain Resolutions passed at said meeting, having reference to same subject—*viz.*:

REGULATION CONCERNING MILITARY DRILL IN THE NORMAL SCHOOLS.

*Article First.*—Military Drill shall, henceforward, form part of the course of studies to be followed by the teacher-pupils of the Normal Schools of Lower Canada.

*Article Second.*—Drill shall be undergone at least twice, but not more than three times, in each week. Each drill to be continued for the space of at least three quarters of an hour, but it must not exceed one hour. The time for such exercises shall be taken, one half from the time devoted to study, the other half from that allowed for recreation as at present fixed by the regulations of each school. The time allowed for dressing and undressing shall be included in the limits given above.

*Article Third.*—The Teachers in training shall, each in his turn, put the pupils of the Model School through the military drill. Two exercises, each of an hour's duration, or four exercises, each of half an hour's duration, at the option of the Principal, shall be undergone weekly.

*Article Fourth.*—The teachers in training shall undergo an examination in this as in the other branches of study, the results being noted and taken into account in the same manner as for the collation of diplomas.

*Article Fifth.*—Military exercises shall form part of the studies rendered obligatory under the regulation respecting the prize founded by His Royal Highness the Prince of Wales.

*Article Sixth.*—The teachers in training shall take proper care of the uniforms, arms and accoutrements intrusted to them, and they, their parents or guardians shall be responsible for the same, of which mention shall be made in the application for admission.

*Article Seventh.*—The sick and infirm pupils shall be exempted from the present regulations, upon producing a certificate from the medical attendant of the school.

*Article Eighth.*—The present regulations shall not apply to the McGill Normal School before the number of teacher-pupils in attendance shall be at least fifteen, or before the Principal shall make known to the Superintendent of Education that he judges the number of teachers in training sufficient. The teachers in training shall, in the mean time, continue to drill with the pupils of the Model School as heretofore.

*Article Ninth.*—At least one hour shall be suffered to elapse after meals before any exercise referred to in the preceding article shall be undergone.

*Article Tenth.*—Such teacher-pupils holding diplomas as shall have accepted situations under the Militia Department, incompatible with teaching in the Common Schools, may be exempted by the Superintendent of Education from fines and penalties imposed by the general regulations of the Normal Schools. All applications for such exemption shall be addressed to him in each particular case.

RESOLUTIONS ABOVE REFERRED TO:

*Resolved, 1st,* That for the purpose of giving effect to the Regulations passed this day respecting Military Drill in the Normal Schools, it is to be hoped that a Drill Instructor may be allowed to each Normal School by the Militia Department; together with arms, uniforms, and accoutrements similar to those furnished the pupils of the Military Schools; and this, free of any charge to the first mentioned institutions.

*2ndly,* That it is also desirable that some advantage or distinction in the Militia be accorded to such pupils as shall have obtained a diploma, after having passed creditably the examination prescribed by Article Fourth of said regulation.

*3rdly,* That a copy of the present resolutions be transmitted to the Executive by the Recording Clerk, together with a copy of the regulations.

JOURNAL OF EDUCATION.

MONTREAL (LOWER CANADA), JANUARY, 1867.

Legal Decision.

The Hon. Justice Polette's decision in *re P. N. Pacaud*, rendered on the 27th November last in the Superior Court sitting at Arthabaska, will serve as a precedent in the interpretation of an embarrassing clause in the law (Sec. 34, sub-sec. 2, Cap. 15, Consolidated Statutes, L. C.). We refer more particularly to the 2nd point in the judgment, which declares that the meeting of a Board of School Commission may be legally presided over by a senior member in office, and that the exercise of the office ceases only when a commissioner is replaced according to law.

The following is a synopsis of the judgment:

1st, That the petitioner, who has voted at an election of School Commissioners, cannot question the legality of the presidency under which such election took place. 2nd, That a meeting of School Commissioners is legally presided over by a senior member of the Board exercising the office; and that said member does not cease to exercise his office until legally replaced agreeably to the provisions of Sec. 34, sub-sec. 2, Cap. 15, of the Consolidated Statutes for Lower Canada. 3rd, That an election so had should

not be declared null unless it is shown that the voting, as well as the other proceedings, has been fraudulent. 4th, That the petitioner cannot, by means of special replies, make allegations not contained in the petition. 5th, That the majority of votes cast for the elected candidate is not a subject for consideration, since the petitioner does not ask to be declared legally elected.

**Education in New Brunswick.**

New Brunswick covers an area of 27,700 square miles, and has a population of about 275,000 souls. It is divided into fourteen counties, its principal cities are Fredericton, St. John, and St. Andrews.

This province, with scarcely a thousand inhabitants, was united with Nova Scotia, a much more populous and progressive colony, until 1785, when it obtained a separate government, although retaining the same constitution.

The main sources of revenue are, the fisheries, the timber, ship-building, and grain. The annual exportations amount to about five million dollars. As our purpose is more particularly to speak of the state of education, we shall not allude further to its commercial or political condition.

The Board of Public Instruction, which forms a section of the Provincial Secretary's Department, is under the immediate direction of its own Superintendent.

There are four School Inspectors. The local school administration is, however, in the hands of Trustees, appointed for several united parishes. There are, besides, certain Committees elected for the immediate oversight of the schools, but hitherto these committees have been appointed only in certain places. Mr. Bennet, the present Chief Superintendent of Education, in his report speaks in high terms of the advantages of these committees, and recommends their organization in every school district, in accordance with the provisions of the school law.

The Council of Public Instruction is composed of the Governor, the members of the Executive Council, and the Superintendent, who is also its Secretary.

At the head of the educational institutions is King's College at Fredericton, founded by royal charter bearing date 18th November, 1823. It was here that many of the leading men of the colony were educated. The college receives an annual grant of £2000 sterling from government. There are grammar schools in every county of the province, with the exception of the counties of York, King's and Victoria. By preparing pupils for the study of the Greek and Latin languages, these schools serve as feeders to the college at Fredericton. They receive annual grants of £100 sterling each from government.

The Baptist congregation have a Seminary at Fredericton; and there is at Mount Allison, an academy belonging to the Wesleyan Methodists.

Government has also established a Training School, with Model School annexed, for the purpose of preparing teachers for their responsible duties. Of 771 masters engaged in teaching during the March term of 1865, 563 were of the trained class,—an increase of 32 on the number of certificated teachers employed during the same term of the preceding year. Of 826 teachers employed in the ensuing term, 598 held diplomas.

The following table will give some idea of the progress made in the interval between the years 1858 and 1865 :

Years.	Teachers.	Trained.	Untrained.
1858	762	313	449
1859	818	442	381
1860	846	520	319
1861	834	530	304
1862	831	554	207
1863	789	561	228
1864	823	580	243
1865	826	598	228

The number of schoolmasters and schoolmistresses employed during the winter was 771; during the spring term 821. The schoolmistresses gained rapidly in numbers on teachers of the opposite sex. Of the 180 diplomas granted in 1865, 161 were given to schoolmistresses and only 60 to schoolmasters.

Each year the examinations have become more and more severe, so much so in fact that some of the teachers holding first class certificates obtained some years ago are now less qualified than those who received second class certificates during the last few years. This having created a desire to secure the renewal of the diplomas at stated intervals, a regulation similar to that which exists in Lower Canada has been demanded.

The teachers are divided into three classes, and receive from the public treasury the following allowances. Masters of the Third class, £22.10; Second class, £30; First class £31.10.5. The schoolmistresses belonging to the Third class receive £17.10; Second class, £22.10; First class, £27.10.5.

School corporations levying the assessment receive from government 25 per cent. extra grant. Nevertheless, the grant accorded by the government must not exceed the average sum of £200, for each parish in any one county, neither must it exceed the sum of £200 for any parish in particular. The number of schools in 1853, and of children attending them, may be summed up as follows :

Counties.	Schools.	Pupils.
Restigouche	22	508
Gloucester	35	1,197
Northumberland	2	58
Kent	36	1,169
Westmoreland	95	2,967
Albert	33	994
St. John	64	2,869
Charlotte	122	2,702
King's	97	2,507
Queen's	65	1,643
Sunbury	22	751
York	56	2,659
Carleton	57	1,612
Victoria	12	575
<b>Total</b>	<b>718</b>	<b>23,211</b>

The number of schools in 1852 was 588, attended by 18,591 pupils, in 1853, as shown above, 718, attended by 23,211 pupils.

The following are the statistics returned for 1865 :

Counties.	Schools.	Pupils.
Albert	31	1,062
Carleton	63	2,257
Charlotte	70	2,921
Gloucester	30	1,012
Kent	38	1,147
King's	99	3,033
Northumberland	45	1,745
Queen's	53	1,570
Restigouche	11	467
St. John	106	5,224
Sunbury	23	687
Victoria	27	730
Westmoreland	87	2,833
York	80	2,699
<b>Total</b>	<b>763</b>	<b>27,417</b>

It does not appear from the figures given above that the increase in the number of schools and of children attending them has been very considerable during the past twelve years; still the Superintendent has cause to be satisfied with the progress which education has made in the Province, as will be seen by the following extract from his report :

" And here I may be permitted to add the testimony of many

intelligent men in nearly all parts of the Province, and of all shades of political and religious opinions, that our schools have attained to a degree of efficiency and usefulness for which they have never yet received credit. It is within the memory of men still young, that throughout wide tracts of country, few persons could be found, except perhaps the Missionary or the Schoolmasters, that were able to compose a decent letter, or draw out the most ordinary document in writing. Now let one go into almost any district where a school has been in operation for a very few years, and it will be found that the occupation of the Missionary and the Schoolmaster, as amanuenses, is all but gone. I make these statements as they have been made to me, not with a view indeed to disparage the past, but rather in the earnest hope that as we have thus improved upon the past, we may likewise be able to improve no less upon the present. Instead of contenting ourselves with having got above and beyond the standard, necessarily a low one, of a past age, or with a flattering comparison, not hard to find, with neighbours no better than ourselves, let us rather set up an ideal standard of perfection, and never cease from our efforts till our achievements shall at least equal our capabilities."

### Short School Time, with Military or Naval Drill: in connection especially with the Subject of an Efficient Militia System.

(Concluded).

*Mistaken views of Education.*—I cannot, however, refrain from alluding, in passing, to the very narrow and mistaken view which many persons take of education. Physical education they wholly ignore, and of intellectual education they take a very one-sided view. With them intellectual education means nothing more than imparting to the child a certain amount of knowledge, and they gauge the value of education by the quantity of information acquired in a given time. Whereas the aim and object of education should be, as the word itself might teach us, to secure the healthy growth and development of the whole man—of all his powers and faculties, physical, moral, and intellectual. The value even of the intellectual training which a boy receives at school or college is not to be tested solely or chiefly by the amount of knowledge he has acquired, the number of dates or facts he may have learned, but rather by the mental discipline he has undergone, the mental power and force he has acquired, the intellectual tastes and habits he has formed; not by the information he has stored up, but by his thirst for information, his power of grasping facts, his faculty of judging rightly; not, in fact, by what he has done, but what he has the power and the will to do; not by what he is *in esse*, but what he is *in posse*. The mistake to which I have referred, as to the objects of education, has led to the "cramping" or forcing system which is the bane of modern education. We insist that everybody shall know everything. As one of our most delightful modern Essayists writes:—"We may in sober seriousness apply to the present age the remark which Sydney Smith, in the fulness of his wisdom and his fun, applied to the master of the Pantologies at Cambridge—'Science is our forte; omniscience is our foible.'" The advocates for this universal knowledge forget that the mind, as Montaigne says, must be *forçé* rather than *furnished*—*fed* rather than *filled*. They forget that of the mental pabulum which we are forced to take at school, none is of any real use to us, but that portion (and it is generally a very homœopathic portion of the whole) which we can digest and assimilate and make to all intents and purposes our own. All the rest is useless, or rather it is worse than useless, because it tends to impair the tone and vigour of the mental faculties; just as an excess of bodily food weakens the digestive organs and impairs the physical health generally.

*Second remedy for the Evil.*—The second remedy for the evils of the present school system is to be found in a proper course of physical training for the pupil, including in that training (for boys) regular instruction in military or naval drill, or both.

It is almost needless to say that no system of physical education should supersede that voluntary physical training, those manly outdoor games which are the delight and glory of the school-boy: cricket, football, prisoner's base, and all such field-games, are, in many respects, the very best possible physical training that a boy can have. But there are many schools where such games cannot possibly be resorted to, and what shall we do with these? Establish a system of gymnastics for them. I am quite willing to admit that

when it is impossible to procure other exercises, gymnastics may be used advantageously for boys and girls, but I think there is a tendency now-a-days to overrate the value of artificial gymnastic exercises, and to mistake muscular strength for health; and on this point I may quote the words of a recent able writer on physiology:

"Gymnastics certainly encourage the development, and increase the power of certain muscles, and those who exercise their muscles in this way will be so far stronger than others. But it does not follow that such persons are healthier than those who take ordinary exercise. It is a remark as old as the time of Hippocrates, that men who practise gymnastics are in a dangerous state of health. They may increase the power of their muscular system, but, if they do so, it is at the expense of the rest of the body, and it was remarked of old, that the athletes and others, who practised gymnastic exercises, were subject to violent disorders, and seldom long-lived.

"It is difficult to prevent boys from taking too much exercise. During the period of growth great fatigue injures the general health. But even when gymnastic exercises are so managed as to avoid this inconvenience, and when they succeed in imparting to the boy an extraordinary degree of muscular development, I am perfectly convinced that the natural adjustment of the functions is thus prevented, for however well fitted the frame of youth may be for feats of agility, nature has not adapted it for strength, the attainment of which she defers until the period of growth is passed; and, consequently, her plans are deranged, when muscular strength is artificially and prematurely obtained."

But admitting, as I am ready to do, that gymnastics under proper regulations, may be made useful for the bodily training of youth, for teaching boys the proper use of their hands and limbs generally, a matter of no slight importance; yet it would be found costly and difficult to introduce systematized gymnastics into the schools of the poorer classes; but, further, and this is a more important consideration, their usefulness would terminate in the physical benefits derived from them. Their intellectual and moral effects would be nil.

To occupy a portion of the time taken from book-instruction, Mr. Chadwick therefore advocates the introduction of regular military or naval drill, as affording, under every aspect, the best kind of physical training for the scholars.

*Evidence in favour of the plan suggested.*—The paper which was submitted by Mr. Chadwick to the commissioners contains the evidence of a number of intelligent witnesses, principally school-teachers and military men, most of whom speak as to the results produced in schools, where the half-time system, accompanied by military and naval drill, had actually been tried. That evidence Mr. Chadwick triumphantly appeals to as establishing conclusively the great value of military drill, whether regarded with reference to, 1st, The present welfare of the individual pupil, or, 2nd, The interests of the nation.

As to the first head he holds that the evidence shews that the new system is attended with the following sanitary, moral, and economical benefits to the individual pupil. We quote Mr. Chadwick's words.—

"1. *Sanitary*—That the drill is good (and for defective constitutions requisite) for correction of congenial bodily defects and taints, with which the young of a very large proportion of our population, especially the young of the poorer town populations, are affected; and that for these purposes the climbing of masts, and other operations of the naval drill, and swimming, are valuable additions to the gymnastic exercises of the military drill, and when properly taught are greatly liked by boys.

"2. *Moral*—That the systematized drill gives an early initiation to all that is implied in the term discipline, viz., duty, order, obedience to command, self-restraint, punctuality, and patience.

"3. *Economical*—That it is proved, when properly conducted by supplying the joints, rendering the action prompt as well as easy, by giving promptitude in concurrent and punctual action with others, to add, at a trifling expense, to the efficiency and productive value of the pupils as laborers or as foremen in after life."

*Mental gain.*—As to mental gain, Mr. Chadwick clearly brings out this point. "A boy," he says, "who has acquired the same amount of knowledge in one half the time of another boy, must have obtained a proportionately superior habit of mental activity." And this is found practically to be the case: the employers of labor giving the preference to "short-timers" as against "long-timers" wherever they can make the choice.

*Interest of the nation in the matter.*—On the second chief topic, as regards the interest of the nation: Mr. Chadwick argues that the general introduction of the drill is called for, and will be of the same use as was of old the parochial training (1) to the use of the bow, he

1. It is perhaps not generally known that up to the end of the fifteenth century, and even later, archery formed part of the ordinary education of

holds that it is proved on practical evidence of officers engaged in the drill :—

1. That military and naval drill are more effectively and permanently taught in the infantile and juvenile stages than in the adolescent or adult stages.

2. That at school it may be taught most economically, as not interfering with productive labor, and that 30 or 40 boys may be taught naval and military drill at 1½d per week, per head, or as cheaply as one man is now taught; that the whole juvenile population may be drilled completely in the juvenile stage, as economically as the small part of it is now taught imperfectly on recruiting or in the adult stage; and that, for teaching the drill, the services of retired drill sergeants, and naval as well as military officers and pensioners, may be had economically in every part of the country.

3. That the middle and higher class schools should have, in addition to the foot drill, the cavalry drill, which the parents of that class of pupils may afford.

4. The drill when made generally prevalent (without superseding), will eventually accomplish, in a wider and better manner, the objects of volunteer corps and of yeomanry, which, as interrupting productive occupations, now becoming more absorbing, is highly expensive, rendering all volunteer forces dependent on fitful zeal, and eventually comparatively ineffective; that the juvenile drill, if made general, will accomplish better the object even of the militia; that the juvenile drill will abate diffidence in military efficiency, and will spread a wide pre-disposition to a better order of recruiting for the public service, will tend to the improvement of the ranks of the regular force, whether naval or military, and will produce an immensely stronger and cheaper defensive force than by the means at present in use or in public view.

And, finally, that the means of producing this defensive force, instead of being an expense, will be a gain to the productive power and value of the labor of the country.

*Influence on the Discipline of Schools.*—We have not noticed, hitherto, the influence of the new system upon the morale and discipline of schools. On this head there is a singular unanimity among the masters of the schools where the experiment has been tried. They all consider the drill as an invaluable help to them in enforcing the ordinary school discipline. And they ascribe the usefulness of drill in this particular to the habits of order, punctuality, of prompt, unquestioning obedience and of respect for their superiors which the boys necessarily acquire during their lesson in drill. Indeed several instances are adduced by Mr. Chadwick's witnesses, where the military drill having been, from one cause or another, discontinued in a school, the spirit of insubordination became such that the unhappy master was compelled to reestablish the drill in order to restore the discipline of the school. It would be difficult to find a better practical commentary on the moral value of the new system.

Sir Francis Bond Head gives his opinion on the moral value of drill in very characteristic and forcible language. "The dull sounding, but magic little words of command—'Eyes right!' 'Eyes left!' and 'Stand at ease!' 'Attention!' &c., instil into the minds of a lot of little boys, the elements, not of war, but of peace. Instead of making them ferocious—to use Mr. Rarey's expression—these words 'gentle' them. By learning to be subservient not to their own will, but to the will of others, they become fit in every possible department to serve their country.

*Military drill more effectually taught in Youth.*—That military drill can be taught to boys at school more effectively and economically than afterwards, is a proposition which few probably will be disposed to dispute. Many, however, may feel inclined to ridicule the idea of "naval drill" in inland schools. On this point one of Her Majesty's School Inspectors, Mr. Tuffnell, cites the opinion of the late Recorder of Doncaster—Dr. Hall :—

"When I first saw," wrote Dr. Hall, "the contrivance (a ship rigged with masts and ropes at a school) at Meitray, in France, I could not refrain from intimating a doubt as to its practical utility. But I found that I was quite mistaken. In France the experiment was tried at the suggestion of the Minister of the Marine himself, and the youths so exercised are received on board ship as sailors, not as lads. At Ruysselade the success is still more striking. In the course of last year, the second of the experiment, no fewer than sixty-four colonists (youths educated at the institution) entered the mercantile marine and the military marine, and their conduct has been so superior that the

the boys of England, and was practised at many public schools. The last Act by which boys were required to be taught archery was passed in 1541.

establishment is overwhelmed with applications from ship-owners." (1) The success of the naval drill, wherever it has been tried in English schools, has, as might have been expected, been quite as satisfactory as in France.

*Gain to the Productive Energy.*—The gain to the productive energy of the country, resulting from the drill system, is a subject of which the importance cannot be overrated. In an opening address delivered by Mr. Chadwick before the British Association for the Advancement of Science, in 1862, he returns to this topic, and discusses it in considerable detail. In that address he shews conclusively the immensely superior efficiency of educated labor over uneducated labor, of those educated under his system over those brought up under the old routine. "On the practical testimony," he says, "of such men as the distinguished members of this association, large employers of labor, Mr. W. Fairburn and Mr. Whitworth, it is established that for all ordinary *civil* labor, four partially trained or drilled men are as efficient as five who are undrilled. In other words, considering the educated child as an investment made by the State, for a trifling expense of about one pound per head, the productive power of that investment may, by physical training, be augmented by one-fifth for the whole period of working ability. Some distinguished authorities," he adds, "consider that he understates the gain of productive power when he put it down as one-fifth, and assert that it is practicable to give to three men by this system the working-power of five." Now, what does this mean? It means that we can, by a change of our mode of education, add as much to the productive energies of the nation as if we had added one-fifth, if not two-fifths, to the number of the working classes, and this "without the expense of educating the additional one-fifth, feeding, clothing, housing them or administering their public affairs."

*School Drill and Natural Defence: Upper Canada.*—We now proceed to say a very few words upon the last topic which we propose to discuss in connection with this subject, namely: the bearing of the half-time system with military drill on the question of our national defence.

From the Reports of the Chief Superintendent of Education for Upper Canada, it appears that the number of boys attending the Common Schools in that part of the Province was, in 1860, in round numbers, 172,000; in 1861, the number was 178,000; in 1862, 183,000; in 1863, 192,000; in 1864, 198,000; and in 1865, 204,000.

The number of boys attending the Common Schools in Lower Canada, for 1860, is not stated in the Report of the Superintendent for Lower Canada. The total number of pupils, however, is given, and assuming the proportion between boys and girls to be about the same as in Upper Canada, the number of boys attending schools that year may be put down at about 80,000. The total number of boys, therefore, in Upper and Lower Canada, attending school in 1860, would be about 250,000 or a quarter of a million. Assuming, however, one-fifth of this number to be, from physical or other causes, incapable of drill, and this is, doubtless, an over-estimate, there would still remain 200,000 boys undergoing drill in our common schools—if the system was universally carried out. At the end of ten or twelve years from the first inauguration of such a system in Canada we should have, probably, half a million of youths who had undergone a regular course of drill; a very large proportion of whom would be capable of bearing arms, and, should the emergency arise, could be readily converted into good and servicable soldiers. Our common schools would thus be made the nurseries of our militia.

*Our duty in this matter.*—It is not very long since the heart of our people was stirred at the near prospect of a struggle between the Mother Country and the States. That struggle has been for the

(1) In the number of *The Athenæum* for December 31st, 1864, there is an interesting account of the results of the "half-time" system in the children's establishment at Limehouse in England.—

"The school is conducted on what is called 'half-time,' a system much recommended, and found to work extremely well. Mr. Moseley, the intelligent and earnest superintendent, gave it as his decided testimony, that the children come to their lesson-books brighter and fresher and give more close and efficient attention when they are on half-time. The children are in school on alternate days, half of them being in the school, and the others employed in industrial occupations. The children are not occupied more than eighteen hours in the week in close book-instruction, the other portion of their time being employed in industrial training.

"The addition of physical training is a wonderful improvement in the system of education. The influence of the drill gives the boys self-respect, they become smart, active, clean-limbed, adroit, they acquire control over their own limbs. Systematized drill gives the boys early an initiation into the virtues of duty, order, obedience to command, self-restraint, punctuality, patience,—no small addition to the value of a man's heritage in himself! Cheerfulness and prompt obedience seemed the characteristics of the children, both boys and girls."



present happily averted; but who shall say for how long? It is to be hoped that if the danger which then threatened us should hereafter actually come upon us, we may not be found as hopelessly unprepared to meet it as we then were. And assuredly, we shall not be unprepared for such an emergency, if we shall have previously established military drill as part of the ordinary instruction given in all our public schools:

It has been wisely said by one of our ablest statesmen, referring to the recent threatened difficulties with our neighbours: "That it is the first point of patriotism with us to create an enthusiastic attachment among all orders of men for our Constitution." If this be the first point of patriotism, I should say that the second is to give all orders of men in our State the skill and ability necessary to enable them to stand forth confidently in the hour of danger in defence of their altars and their homes.

It is to be remembered, too, that within the last few years the position of Canada, both as regards the Mother Country and the States, is entirely changed. To England we had been in the habit of looking with confidence for protection from every danger, and from the States we thought there was no danger to be apprehended. Now, on the contrary, we have received warning from England that we must take measures to protect ourselves, and, at the same time, we have received warning from our neighbors that we need to do so. It is this peculiar crisis in our colonial history which gives to the question of our national defences such paramount interest at the present moment. In the energy and zeal with which, on the recent occasion to which we have referred, men of all ranks, from one end of the Province to the other, responded to the call to enrol themselves for the defence of the country, we have an earnest and a proof of the spirit which animates the people. It will be the wisdom of our statesmen to foster and encourage the spirit of patriotism, and to turn it to the best account.

*What our Neighbours are doing.*—Our neighbours across the lines have not been slow to perceive that the best way of promoting the growth of patriotism and a love of military life among their citizens is by following out the Chadwick system, and making military drill part of the ordinary business of their schools. The system has in fact been in practical operation for the last two or three years in many schools and colleges in the Union. The Governors of the States of New York and Massachusetts have, in their addresses to the State Legislature, called attention to the subject as one of momentous importance. Educational reformers have advocated it, and measures have been introduced (if they have not been actually passed) into the Legislatures of certain States, to make military drill compulsory on all boys above ten years of age attending the schools which receive aid from the public purse. "*Fas est et ab hoste doceri.*" We have learned from our neighbors many a lesson, which had far better been left unlearned; let us learn from them, in this at least, one good and useful lesson. A senator in Massachusetts lately, giving his views on the importance of military studies in colleges, says: "Let the drill be regular and compulsory, taking the place of the very irregular and inefficient physical exercise now in vogue, and our colleges would be vastly improved in their educational form, and the commonwealth would in a short time have a numerous body of intelligent men, well skilled in the military science and art, who will become teachers in our lower grades of schools, and be competent, when the alarm is sounded, to lead our citizen soldiers in the field."

*What is doing in the Canadian Schools.*—In view then of the present crisis of our national history, it is satisfactory to know that in Canada some steps are being taken towards "putting our house in order." In both sections of the Province the able Superintendents of Education have, of their own accord, established military drill in a large number of the grammar and common schools throughout the country. In the *Journal of Education* for Upper Canada, many admirable articles on the subject of military drill in schools have from time to time been published. The Chief Superintendent of Education in Upper Canada, informs me, that eighteen grammar schools reported military drill as part of their course of training in 1863, and he also states, what is perhaps even more important, that during the last six months of 1863, the students in the Normal School have formed themselves into a drill association, which he adds will doubtless contribute much to the general introduction of military drill into the Common Schools of Upper Canada.

In connection with the movement may be mentioned the encouraging fact, that the companies which have been formed in the schools and colleges, both in Upper and Lower Canada, are amongst the most proficient in the Province, and that they have received high encomiums on several occasions from the military officers who have inspected them. This is, indeed, only what might have been anticipated. Colonel Wily, of the Adjutant General's Department (himself an experienced soldier), on whose authority the preceding statement

is made, has long earnestly advocated the introduction of military drill into schools, and he cites, as a proof of the practical results of the system, the admitted superiority of the militia of the Channel Islands, particularly of the Island of Jersey, of which he is a native.

Drilling and volunteering have, for the last two years, been the order of the day in Canada, and most men under fifty and some over that age have been initiated in the "goose-step," and learned the mysteries of "forming fours." If from our drill experience we have learned nothing more, we must have at least learned this lesson: that soldiers are not made in a day, and that to expect to make an efficient militia by drilling men, taken from the plough or from the workshop, for three or four weeks in the year, is simply absurd.

An English statesman once designated the militia as *depositories of panic*. And the great Dryden describes the militia of his day in far from flattering terms, as

"Mouths without arms, maintained at vast expense,  
In peace a charge, in war a weak defence."

If we desire to have in Canada a militia the opposite of this; a militia which will cost us little; one of which we may feel proud in peace and upon which we may rely with confidence in time of war; a militia in a word which will recall the memories, and be ready to repeat the deeds of our ancestors in 1812; we must see that our sons, while at school, learn thoroughly their military drill. There let us instruct them in the first rudiments of the arts of war as well as peace. There let us teach them to regard it as their pride as well as their duty to be *ready, aye ready*, to stand forth, when the need comes, to do or die for their country. There let us imbue them with that high and noble patriotism, that spirit of intelligence and self-reliance which, aided by physical health and strength, will make them good men, good citizens, and good soldiers, the ornament at once, and best defence of their country.

## MONTHLY SUMMARY.

### EDUCATIONAL INTELLIGENCE.

— *Apropos* of the agitation for University Extension at Oxford, of which we have lately heard so much, the *London Review* of the 22nd September publishes, "from the researches of a local archaeologist," the subjoined table of the numbers of Students at Oxford at different periods of the history of the University:—

A D 1209.	The total number of Masters and Scholars.....	3,000
" 1231.	Increased to.....	30,000
" 1263.	Reduced from various causes to.....	15,000
" 1359.	At the time of the Plague.....	3,750
" 1360.	On the return of the Students after the Plague....	6,000
" 1631.	According to a census in the Long Vacation.....	2,920
" 1831.	Residents in Colleges and Halls only.....	1,634
" 1837.	Total number on the books.....	5,229

*Educational Times.*

— We learn from the *American Educational Monthly* for September, that a Bill for the establishment of a "Department of Education" has passed the House of Representatives at Washington. The preamble of the Bill declares the Department to be established "for the purpose of collecting such statistics and facts as shall show the condition and progress of education in the several States and territories, and of diffusing such information respecting the organisation and management of schools, the school system, and methods of teaching, as shall aid the people of the United States in the establishment of different school systems, and otherwise promote the cause of education throughout the country." The management of the Department is to be entrusted to a "Commissioner of Education," whose duty it shall be to present annually to Congress a report, embodying the results of his investigations and labours, together with a statement of such facts and recommendations "as will in his judgment subserve the purpose for which the Department is established."—*16.*

— At the recent distribution of prizes to the pupils and students of the Communal Schools of the Eleventh Arrondissement of Paris, M. Charles Robert, Secretary-General of the Ministry of Public Instruction, dwelt with natural pride on what has been done during the past twelve months in that country for the instruction of adults. It was difficult, he said, to imagine the trouble and sacrifices which had been required to establish 25,000 adult classes in the Communal Schools of France. The results were given by M. Robert as follows.—"From November, 1865, to March, 1866, 30,000 teachers, male and female, taught 25,000 classes of adults, containing a total of 600,000 students; 250,000 illiterate persons were taught to read, write or cypher. Of the whole number of students, 117,000 paid in all a sum of 415,000 francs for their instruction; 15,000 teachers gave their services gratuitously; and 4000 others subscribed 91,000 francs towards the expenses. The Communes of France gave 650,000 francs

towards the work, the Departments, 72,000 francs, and the friends of instruction, 125,000 francs." In all, £37,520 expended by others, and £16,000 by the illiterate themselves, for the education of adults, in five months. Well might M. Robert say,—"The year 1866 is that in which the grand cornerstone was laid; and if I had to write an inscription for the plate, which it is the custom to fix in a foundation-stone, I would simply inscribe the figures just given."—*Id.*

—The "General Report on Public Instruction in the Lower Provinces of the Bengal Presidency for 1864-65" has just been published. During the year there has been an increase of 583 schools and 22,792 scholars 1281 candidates for the entrance examination of the University of Calcutta presented themselves from Bengal, of which 33 were Mohammedans, 55 Christians, 1 Parsee, and 1192 Hindoos. Both among the Hindoos and Parsees a decided beginning has been made in the education of their girls, and the movement must accelerate as the education of the males themselves becomes elevated and broadened. At the Convocation of the University of Bombay for conferring degrees, it was stated that 109 out of 241 candidates passed the matriculation examination in November last, of whom 86 were Hindoos, 19 Parsees, 2 Portuguese, 1 European, 1 Mussulman. Of 32 candidates, 15 passed their first examination in Arts; of 20 candidates for the degree of Bachelor of Arts, 15 passed examination; and 2 Parsee candidates passed the examination for the degree of Master of Arts.—Mr. Premchund Roychund (a lucky cotton speculator, who had already given 100,000 dollars to the Calcutta University, has given a like sum to the Bombay University, towards the erection of a library, and a further sum of 100,000 "towards the erection of a tower to contain a large clock and a pair of bells."—*Id.*

*Flogging in School*—Gradually the practice of flogging children at school and at home is going out of practice, and wiser modes of government by love and reason are taking its place. Occasionally, however, the old practice is revived, as was the case recently in Cambridge, Mass., where a school-girl was whipped for some reason not stated. The result was a threatened suit, and a resolution by the Board of Education that "corporal punishment should be abolished in all the schools of the city." During the discussion of the subject, Prof. Agassiz, who is much ahead of the age in many if not most things, expressed himself as unequivocally against all corporal punishment, whether of boys or of girls. He has been a teacher forty years "without ever striking a blow." The best teachers of this and other countries rarely if ever resort to the rod, and he is indeed a poor teacher who needs continually to appeal to it.—*Herald of Health.*

## LITERARY INTELLIGENCE.

—A very interesting mass of historical letters has been found in the old city library of Philadelphia. A book was being shown to a recent tourist in America as a collection of mere autographs, which the tourist saw, at a glance, contained a missing portion of the great series of public instructions from the Privy Council of James the First to the Lord Deputy of Ireland. The letters are numerous—many hundreds, and cover the whole of the very important administration of Sir Arthur Chichester. They are said to have been carried away (*abstracted* might be the better word) from Ireland by a retiring Lord Chancellor in the troubled time of William the Third. On its being pointed out to the city authorities that these records—of little value where they stand, cut off by the Atlantic Ocean from the series—belong to the Crown of England, and are a portion of our national archives, a ready disposition to restore them to their proper place in our Record Office was at once evinced. Of course some forms will have to be gone through, but we have no hesitation in saying that when these forms have been observed, these remarkable State Papers will be restored to the Crown.—*Athenaeum*

## ARTS INTELLIGENCE.

*Chromo-Lithography.*—This beautiful art is making a rapid progress in this country, a fact we are most happy to record. Messrs. L. Prang & Co., of Boston, by a great deal of conscientious labor, have succeeded in producing a great variety of the most elegant specimens of this art. We have now before us four specimens of their most recent chromos, copied from French water colors. These pictures, The Linnet, The Bullfinch, The Sisters, and The Baby, are so skilfully done, that a practiced eye would scarcely detect that they were not genuine oil paintings.—*Scientific American.*

—At Lyons silk and linen goods are exhibited for sale having names and devices photographed upon them. The process is said to be easily and rapidly effected, and the picture is not at all injured by washing.—*Id.*

The 'Chronique des Arts' announces that France has just experienced a great loss. England has purchased the entire collection of cameos, medals, bronzes, &c., belonging to the Duc de Blacas. While France was appointing a committee to put a value on the gems, England sent Mr. Newton with £48,000, and carried them off to the British Museum.

The collection has been packed up in Paris, and will soon be transferred to London. It consists of the following:

1. A choice collection of ancient gems, in intaglio and cameo, together with many fine specimens of the artists of the Renaissance.

This collection was formed principally by the father of the late Duc de Blacas, by the union of the Strozzi, Berth and De la Turbie collections. The celebrated cameo of Augustus, and many others of the choicest specimens, are from the Strozzi collections, and are published in the well known works of Stosch and Gori.

2. A collection of Greek and Roman coins in gold, silver and copper. The Blacas cabinet of Roman coins is well known to numismatists as one of the most complete in Europe. The rare and choice specimens which it contains are cited in every page of the great work of Mr. Cohen on Roman Numismatics, and among them are several pieces of which neither the Bibliothèque Impériale at Paris nor the British Museum can show a single example.

A portion of this precious collection is enshrined in a beautiful inlaid cabinet, formerly belonging to the Empress Josephine, and ornamented with her cipher.

3. The celebrated toilet service of a Roman bride, consisting of a large casket and many vases, small figures, personal ornaments and trappings, all of silver gilt, and covered with mythological reliefs, embossed and chased. An inscription on the principal casket tells us the name of the lady honored with so magnificent a nuptial present. The words are "*Secunde et Trojecta, vivatis in Christo.*"

This happy pair, whose portraits appear on the cover of the casket, surrounded by Cupids, lived probably at the close of the third or beginning of the fourth century of our era, and, though converts to the new religion, evidently retained a certain sympathy with the associations of a Paganism not yet quite effete, for, otherwise, they would not have permitted the artist to cover these nuptial presents with such a rich variety of mythological subjects and emblems. This matchless treasure of ancient metallurgy, one of the very few which has escaped the rapacity of the barbarous invaders of the ancient world, was found at Rome when the father of the late Duc de Blacas was ambassador there, and has been published by Visconti.

4. A colossal head of Æsculapius, of the finest period of Greek sculpture, found in the island of Milos, with a votive inscription addressed to Æsculapius and Hygeia. A crown of bronze, of which the stems still remain in the marble, has encircled his head. It was brought from Milos by a French Admiral, by whom it was presented to the father of the late Duc de Blacas. An engraving of it may be found in the 'Expédition Scientifique de la Morée,' published by the French government.

5. A collection of Greek fictile vases, chiefly from the Basilicata, formed with admirable taste and knowledge by the late Duke and his accomplished father when ambassador at the Papal and Neapolitan courts. It is remarkable for the number of rare and curious mythological subjects represented, and which are well known to archaeologists in the 'Musée Blacas' of Panofka, and the 'Monumens Céramographiques' of MM. Lenormand and De Witte. The two generations of the Blacas family to whose taste and science we owe this collection, with discerning liberality, invited the savans of France and Germany to study it, and it is not too much to say that no private collection in Europe has more contributed to the development of archaeological research.

6. Seven mural paintings from Pompei, Stabia and Herculaneum, presented by the King of Naples to the father of the late Duc de Blacas when ambassador at Naples.

7. A small but choice selection of Greek and Roman bronzes, including a bust of Lucius Verus, an unique figure of Possidon Hippios, and some fine specimens of Greek armor.

8. A collection of Greek terra cotta figures and some fine specimens of Greek and Roman glass.

9. A small but choice collection of Egyptian antiquities, many of which were obtained in Egypt during the French expedition under Napoleon I.

10. A numerous and interesting series of Greek and Roman weights, extending down to the Byzantine period. The late Duc de Blacas was engaged in translating Mommsen's work on Roman meteorology, and had already published the first volume when he was prematurely cut off by sudden illness in the spring of this year.

11. A leaden vase ornamented with figures of Cupids in reliefs, evidently the model from which a vase in a more precious metal was to have been made. This bears the inscription—"Domitilla Statilio conjugii"—(Domitilla to her husband Statilius) This Domitilla afterwards became the wife of the Emperor Domitian.

12. A most curious collection of mediæval bronze vessels, covered with rich arabesques and Arabic or Persian inscriptions. These have been published in the 'Monumens Arabes' of M. Renaud. One of them, richly ornamented with hunting scenes, bears the name of the artist, a native of Mosul. A large tray, such as is still in use in the Levant for carrying in a dinner on the head of an attendant, is inscribed with the name of the Mameluke Sultan Schubar and the date 1345 A D.

13. Several very curious Oriental manuscripts among which are two fragments relating to the worship of Buddha, in the Mogul language, and four manuscripts in the language of Thibet, containing translations from Sanscrit of very ancient date.

These curious specimens of Oriental palæography were part of a collection obtained by the Russian government from Central Asia. The remainder are at St. Petersburg.

14. An interesting collection of Roman inscriptions, chiefly sepulchral, published by Mommsen. They were obtained at Naples.

15. A choice collection of Greek, Etruscan and Roman gold ornaments, including a beautiful pair of earrings found in the island of Cephalonia.

16. One hundred and seventy-nine folio copper-plates, on which are engraved most of the finest objects in the Blacas Museum. This series of plates has been executed in Paris under the personal superintendence of the late Duc de Blacas, for the great work on his museum, which he was preparing for publication at the time of his death. The text which was to have accompanied these plates has been prepared by M. De Witte, who has devoted many years to the study of the Blacas Museum. The manuscript of this text is now the property of the British government.

— The Paris correspondent of the *Morning Post* writes:—“Photography in Paris is making wonderful advances. We have an annual exhibition of the Photographic productions of France, Germany and England, in the large exhibition building, Champs Elysées, in conjunction with the works of painters and sculptors. The student of photography here looks out each year for that long-desired and long-prophesied triumph of chemistry, the production of colour, but we have not yet met with it in these vast collections. The honour of producing on paper the exact colouring which the human form throws on the camera has been reserved for Mr. Chambay, whose process I have carefully investigated, and am able to declare that he succeeds in producing a portrait which gives all the exquisitely varied tints of flesh, together with a transparency in the shades never before attained. This is a great chemical triumph. We have in Paris admirable examples of tinted or painted photographic portraiture, but we have never yet got colour as well as from *Chambre noire*. Mr. Chambay is at present almost unknown in his out of the way studio in the Avenue Montaigne, and therefore I feel the more pleasure in recording this great chemical and art event of the day. For the first time I have seen photography doing justice to female beauty; and never did the human hand reflect flesh and texture of drapery with such wonderful exactitude. Henceforward the photographic artist possessing this secret has only to place his men and women in a graceful and intelligent attitude, and that which a looking glass reflects will permanently rest on the paper. No attempt has yet been made by the artist to produce landscape, and it is with him yet a problem if colour can be held and printed after a certain distance. But one long-sought object has been attained, so far as portraits are concerned, and it dates a new era in photography.”

#### SCIENTIFIC INTELLIGENCE.

— The Rev. John Earle, writing to the London *Guardian*, says:—“Perhaps it would be acceptable to some of your readers to be informed that shooting stars are recorded in our vernacular Annals under the years 744 and 1095. The first is a short sentence of a lost Anglican Chronicle that was kept probably in Yorkshire, and to which two of our southern chronicles—viz., D. and E., were indebted for materials. The entry of 744 in E contains these words—“And, steorra foran swrde scotienda :” that is, *And stars went shooting remarkably.*

The record of 1095 is more circumstantial. “On thism gear wæron Eastron on viii kal’ Apri’, and the uppon Eastron on See Ambrosius mæsse nht. that is ii wo Apr wægesewen forneah ofer eall this land swiþe forneah ealle tha niht swiðe mænifæddlice steorra of licofenan feollan, naht be anan odde twan, ac swa thiclice thaet hit nan man atælan ne mihte.” This year Easter was on the 25th of March: and presently after Easter, on the night of the Festival of St Ambrosius, that is the 4th of April, was there seen almost all over this land, as it were almost all night long, vast multitudes of stars fall from heaven; not by ones or twos, but so thickly that no man was able to kee, count of it. This might pass for a true and faithful description of what we saw a few nights ago. But I do not find that in either instance the interval of years is divisible by 33. In your admirable article on the theory of these appearances in your last number, it was implied that there was a fractional remainder over or under the 33 years cycle, and this may perhaps be worth taking into calculation where eight or eleven centuries are concerned.

— About a month ago, during the excavations of a peat bed in Cohoes for the foundation of a new mill, now in the course of erection by the Harmony Manufacturing Company, the jaw bone of a mastodon was discovered about thirty feet below the surface of the earth. This relic of the antideluvian age is of immense proportions, and has attracted the attention of geologists and students of nature from all parts of the country—letters of inquiry respecting it, and personal examination having been made by some of the most distinguished savans of the United States. But on Wednesday, even this wonderful discovery was eclipsed by the excavation of still further fossiliferous remains, which complete nearly the bones or framework of the mastodon. Eighty-five feet below the earth’s surface, and about fifty feet below the place of the original discovery, the workmen yesterday came upon the remaining bones, consisting as follows: Two tusks, back bone, the upper jaw and cranium, a number of the ribs, the hip bones, shoulder blades and the bones of the hind legs. The tusks were each nearly six feet long and about nine inches

in diameter. One of them, upon exposure to the light, crumbled to pieces, like clay, resembling that substance in appearance and texture.

The ribs, of which there were 14 found, are about 4 feet long, the largest being 4 feet 9 inches. The upper jawbone is 4 feet 9 inches long from the extremity of the mouth to the cranium, and across the forehead measures about 3 feet. So heavy is it that it was with difficulty four laborers could move the mass. The sockets in which originally were located the eyes of the monster are almost large enough to admit the head of a man. The hip bone is 5 feet long, and weighs 100 pounds, the shoulder blades measure 23 inches in diameter. The vertebrae of the backbone are 8 inches in diameter. The other fragments found are in harmonious proportion to those already mentioned.

Professor Marsh, of Yale College, was present soon after the discovery was made, and pronounced it the most remarkable scientific event of the age. The structure will now be united in its several parts by means of wire, and thus a very accurate idea can be formed of the size and weight of the monster to which it belongs.—*Am. Paper.*

— A curious stone figure has been found in a quarry at Wishaw, Scotland, which is to be sent to the British Museum. A local paper says:—“On the bank of the freestone quarry, which is being worked at the low end of the town of Wishaw, is to be seen a sculptured-like form, which, at first glance is not unlike one of the winged bulls that have been dug out of the sand heaps which have embedded the ruins of ancient Nineveh. The operations of the quarries have recently disinterred it from its rocky tomb in the bottom of the quarry, and, by great care in Jewing out the rock around it, they have been enabled to secure it in an almost entire state. The workmen have turned up many similar forms of late, of smaller size, but when this was first met it created quite a sensation among them, for, from the position in which he was found lying, the parts first uncovered bore a remarkable resemblance to a human form. Its head and body together measure about eight feet long, and its shape is somewhat different from any member of the saurian tribe that has hitherto been discovered in the same section of rocks. It seems to belong to a higher order of life, and bears a strong resemblance to members of the seal or walrus tribe that tenant the seas and lounge on the shores of the present day. It appears to be lying on its side, on a line parallel to what may have been the tidal wave. Its fins or paddles, are folded into its belly. The rock in which it was found overlies the main coal, and is of that description designated by the quarriers and builders as liver rock—an amorphous freestone, having neither beds or vertical cracks, presenting the appearance of having been formed in convulsive waters, and under different conditions from the ordinary bedded rocks. A few yards from the place where these fossil mummies have been extracted, algae or seaweed are seen in great abundance.—*Exchange.*

— The “Solar Caps” or dark glasses which have hitherto been adapted to the eye-pieces of telescopes to intercept the heat, and as much as is unnecessary of the light of the sun, are all more or less objectionable as giving a tint to the solar image which might interfere with the real colour, and in some cases perhaps affect the visibility of the more delicate details. A very ingenious contrivance has lately been introduced by G. and S. Merz of Munich to obviate this defect. It is well known that the rays of light, when reflected at a certain angle from a surface of glass, become polarized, and consequently will be either transmitted through, or reflected from, a second similar surface, according to the angle under which the latter receives them. In Merz’s new solar eye-piece, 2 pairs of plane glass mirrors (of course, un-silvered), are so arranged as by the rotation of one pair relatively to the other, to intercept at pleasure the whole, or any required part, of the light transmitted through the telescope. Secchi’s opinion of this contrivance is decidedly favourable. He says, “Your helioscopic polarizing ocular is preferable, because it shows the sun of its true colour; thus films which appeared blue in the ordinary oculars with blue glass, are seen with yours of a rosy hue, the same tint as the protuberances which are seen during eclipses. This is an important fact.” It is to be hoped that Mr. Browning or some other skillful optician will turn his attention to this construction in our own country, where the solar phenomena are at present attracting so much notice.—*Intellectual Observer.*

— Marshal Vaillant informs the French Academy that Marshal Bazaine has found a Mexican aerolite, weighing not less than 860 kilogrammes. It is on its way to France and will figure in the exhibition of 1867.—*Id.*

— M. Le Verrier informs the French Academy that another planet, the ninety-first, has been discovered at the observatory Marseilles.—*Id.*

— *Annals of Natural History* contains a report by Mr. George Jeffreys on *Dredging among the Hebrides*, in which he states that Professor Sars is of opinion that Dr. Walljch’s deep sea star fish is an *Ophioacantha spinulosa*, a well-known Greenland species, found usually from 20 to 190 fathoms depth. He states that Professor Sars has enumerated fifty-two species and distinct varieties of animals found by himself at a depth of 300 fathoms—sponges, rhizopods, actinozoa (anemonies), polyzoa, true mollusks, and worms. The Swedish deep sea dredgings, in the exception to Spitzbergen (1861), sounded depths of from 6000 to 8400 feet (1400 to 1900 fathoms), and the sea bottom at these depths was covered with a fine greasy-feeling

material of a yellowish-brownish or grey colour, rich in diatomacea, and polythalamia, annelids, crustace and mollusca were found at these depths.  
—*Id.*

—Animals of small stature are by no means proportionally the weakest. Pliny in his "Natural History," asserts that, in strength, the ant is superior to all other creatures. The length and height of the flea's leap also appear quite out of proportion to its weight. No very definite conclusion, however, had hitherto been arrived at. M. Plateau has settled the question by employing exact science as the test. Insects belonging to different species, placed on a plane surface, have been compelled to draw gradually increasing weights.

A man of thirty, weighing on an average a hundred and thirty pounds, can drag, according to Regnier, only a hundred and twenty pounds. The proportion of the weight drawn to the weight of his body is no more than as twelve to thirteen. A draught-horse can exert, only for a few instants, an effort equal to about two-thirds of his own proper weight. The man, therefore, is stronger than the horse.

But, according to M. Plateau, the smallest insect drags without difficulty five, six, ten, twenty times its own weight, and more. The cockchafer draws fourteen times its own weight. Other coleoptera are able to put themselves into equilibrium with a force of traction reaching as high as forty-two times their own weight. Insects, therefore, when compared with the vertebrate which we employ as beasts of draught, have enormous muscular power. If a horse had the same relative strength as a donacia, the traction it could exercise would be equivalent to some sixty thousand pounds.

To ascertain its pushing power, M. Plateau introduced the insect into a card-paper tube whose inner surface had been slightly roughened. The creature, perceiving the light at the end through a transparent plate which barred its passage, advanced by pushing the latter forward with all its might and main, especially if, excited a little. The plate, pushed forward, acted on a lever connected with an apparatus for measuring the effort made. In this case also it turned out that the comparative power of pushing, like that of traction, is greater in proportion as the size and weight of the insect are small. Experiments to determine the weight which a flying insect can carry were performed by means of a thread with a ball of putty at the end, whose mass could be augmented or reduced at will. The result is, that during flight, an insect cannot carry a weight sensibly greater than that of its own body.

Consequently, man, less heavy than the horse, has a greater relative muscular power. The dog, less heavier than man, drags a comparatively heavier burden. Insects, as their weight grows less and less, are able to drag more and more. It would appear, therefore, that the muscular force of living creatures is in inverse proportion to their mass.—*All the Year Round.*

—M. Terrell, who visited Palestine in 1825, has addressed a note to the French Academy of Sciences, on the chemical composition of the waters of the inland salt lake. It has generally been believed there were no living creatures in it, but the author says he saw, in one spot near Sodom, a number of small fish that seemed to thrive well. The following is a brief of his observations:—

1. The density of the waters of the Dead Sea increases with their depth.
2. Their composition and concentration are likewise variable; thus samples taken five miles east of Waddy Mrabba contain four times more calcium than those five miles east of Ras Teshka, which contain twice as much soda as the former.
3. Samples of water from north of Sodom, in that part which forms a lagoon, contain more chloride of sodium (common salt) than chloride of magnesium, which explains why fish may live there.
4. The bromides alone seem to be concentrated much more in depths exceeding 300 metres.
5. The lake contains no iodine or traces of phosphoric acid, and but small portions of sulphates.
6. The residue, after evaporation, examined with the spectroscope does not show the presence of the rarer alkaline metals, lithium, cesium or rubidium.—*Exchange.*

—Mr. Grove's doctrine of the Continuity of the Universe has received a brilliant illustration during the past month, in the presence of many thousands of astonished witnesses. The "world-dust," which, he says, fills up the vast deserts of interplanetary space, revealed itself in unexpected splendour in the wonderful meteoric display of the night of the 14th of November. Astronomers had foretold the apparition, but few persons had any notion beforehand of the wealth of glory in which it actually manifested itself. The sky was happily clear at the proper moment—a rare and choice coincidence for an event that happens on a November night once only in thirty-three years—and for more than two hours the heaven was alive with fiery messengers. According to the most careful reckoning—that of Greenwich Observatory—seven thousand shooting-stars were counted between eleven and five o'clock, and of these four thousand were observed between one and two. It is not possible as yet to collect the scientific results of this display. The existing theory with regard to these bodies,

it is perhaps needless to say, is that, besides the planets, the sun is surrounded by a multitude of small bodies, which are gathered into several distinct rings revolving round him by the force of gravitation. The well-known appearance of Saturn's rings may help the imagination to conceive this condition of things; bearing in mind that Saturn's rings lie all nearly in the same plane, and thus expose a large mass of surface for the reflection of light, while those of the sun are inclined to one another at different angles, and are only visible to us when our planet in its annual course intersects one of them. For then their speed is arrested by contact with the upper regions of an atmosphere, which, thin as it is at that distance, from fifty to eighty miles high, is yet able to oppose a sensible resistance to their motion. The consequence is, that this motion—by the law of the correlation of forces—is transformed, wholly or partially, into light and heat. And as these bodies enter our atmosphere with an average velocity of thirty-five miles per second, it is easy to see that an enormous quantity of light and heat will be generated by its arrest and destruction.—*Educational Times.*

—The Reader draws attention to a remarkable opinion and theory of Sir John Herschel's with regard to the nature of those curious objects discovered by Mr. Nasmyth on the surface of the sun, and generally called, from their peculiar shape, "willow leaves." We believe Sir John first propounded this theory in an article on the sun, published in *Good Words*, but it does not seem to have been noticed by many astronomers. However wild the hypothesis may appear, it has just received a further sanction from its eminent author, by its republication in his new book of *Familiar Lectures*. Sir John says, "Nothing remains but to consider them [the so-called willow-leaves] as separate and independent sheets, flakes, or scales, having some sort of solidity. And these flakes, be they what they may, and whatever may be said about the dashing of meteoric stones into the sun's atmosphere, &c, are evidently the immediate sources of the solar light and heat, by whatever mechanism or whatever processes they may be enabled to develop, and as it were elaborate these elements from the bosom of the non-luminous fluid in which they appear to float. Looked at in this point of view, we cannot refuse to regard them as organisms of some peculiar and amazing kind, and though it would be too daring to speak of such organization as partaking of the nature of life, yet we do know that vital action is competent to develop both heat, light, and electricity." Strange and startling as is such an explanation, yet scientific men will remember, that when we knew as little about the cause of the black lines seen in the spectrum of the sun, as we now know about these appearances on the sun itself, Sir John Herschel suggested in 1833, that very explanation which was the foundation of the memorable law announced by the German philosopher, Kirchoff, in 1859, a law now universally accepted as affording a perfect solution to the long-standing puzzle of Fraunhofer's lines.—*Id.*

—The constantly increasing price of rags has led paper-makers, for some years past, to turn their attention to the discovery of other materials suitable for paper stock. All kinds of plants, from those which grow near our own door to the luxuriant growths of tropical regions, have been experimented on with but partial success; but it now appears probable that for the future our main source of supply will be the forest. It is at least a century, and we do not know how much longer ago, since paper was made experimentally from wood, and, notwithstanding repeated improvements, the requirements of cost and quality have not until recently been met. The manufacture of wood paper is now, however, an accomplished fact. There are two large establishments near Philadelphia where it is carried on. In one of these a paper containing 60 per cent of wood pulp is turned out; and in the other, which is on an immense scale, an excellent paper for printing purposes, composed of 80 per cent. wood and 20 per cent straw, is made. The larger and more successful establishment is capable of turning out from 24,000 to 30,000 lbs. of pulp daily.—*Id.*

—A correspondent of the *London Builder* says: "From several years' observations in rooms of various sizes, used as manufacturing rooms, and occupied by females for twelve hours per day, I found that the workers who occupied these rooms which had large windows with large panes of glass in the four sides of the room, so that the sun's rays penetrated through the room during the whole day, were much more healthy than the workers who occupied rooms lighted from one side only, or rooms lighted through very small panes of glass. I observed another very singular fact, viz: that the workers who occupied one room were very cheerful and healthy, while the occupants of another similar room, who were employed on the same kind of work, were all inclined to melancholy, and complained of pain in the forehead and eyes, and were often ill and unable to work.

Upon examining the rooms in question, I found they were both equally well ventilated and lighted. I could not discover anything about the drainage of the premises that could affect the one room more than the other; but I observed that the room occupied by the cheerful workers was wholly whitewashed, and the room occupied by the melancholy workers was colored with yellow ochre. I had the yellow ochre washed off, and the walls and ceilings whitewashed. The workers ever after felt

more cheerful and healthy. After making the discovery, I extended my observations to a number of smaller rooms and garrets, and found, without exception, that the occupants of the white rooms were much more healthy than the occupants of the yellow or buff colored rooms, and wherever I succeeded in inducing the occupants of the yellow rooms to change the color for whitewash, I always found a corresponding improvement in the health and spirits of the occupants."

—Some two years ago, while going down Broadway, in New York, blood commenced running from my nose quite freely. I stepped aside and applied my handkerchief, intending to repair to the nearest hotel, when a gentleman accosted me, saying, "Just put a piece of paper in your mouth, chew it rapidly, and it will stop your nose bleeding." Thanking him rather doubtfully, I did as he suggested, and the flow of blood ceased almost immediately. I have seen the remedy tried since quite frequently, and always with success. Doubtless any substance would answer the same purpose as paper, the stoppage of the flow of blood being caused doubtless by the rapid motion of the jaws, and the counter action of the muscles and arteries connecting the jaws and nose.

Physicians state that placing a small roll of paper or muslin above the front teeth, under the upper lip, and pressing hard on the same, will arrest bleeding from the nose—checking the passage of blood through the arteries leading to the nose. H. C. K.—*Scientific American*.

—A correspondent of an American journal says that oil or essence of penny-royal is "a specific against the attack of fleas. I have always used it when flea: were in my bed or about my clothing, and found that it would banish them entirely, and I am now using it with equal success to banish mosquitoes; they will not come near where it is."—*Exchange*.

—Pugot succeeded in adjusting the eye of a flea so that by the use of the microscope he was enabled to see objects through it. It multiplied and diminished every object. Thus a soldier appeared like an army of pigmies.—*Exchange*

—The curvature of the earth amounts to seven inches per mile. A man six feet high cannot be seen from a distance of ten miles.—*Il*.

#### NECROLOGICAL INTELLIGENCE.

—Many of our readers will remember Mr. Faribault, who was many years the second clerk in the House of Assembly. They will, therefore, not be displeased to read some particulars of the life of this gentleman who was buried last Monday. We extract from an obituary article of the Rev. Mr. Casgrain of Québec. His family was originally from Mons in France, his grand-father having been born, however, at Paris, where he was a notary. He was sent to Canada by the French Government in 1754 as Secretary to the army, under the Marquis Duquesne, and he fulfilled the functions of that post till the defeat of the French army under Montcalm in 1759. After the colony had passed under British rule he retired to Berthier, and lived by the practice of his profession till 1801, when he died, aged 88 years. The eldest son of ten children became a notary; the youngest went into the service of the North-West Company, and after a time became the founder of the town called Faribaultville in Minnesota. The eldest son married a Miss Anderson, the daughter of one of Fraser's Highlanders; and George Barthélemi Faribault was the issue of that marriage. He had gone to school to a Mr. Fraser, one of Wolfe's veterans, and after studying with the Hon. J. A. Panet, was called to the bar in 1811. In 1812 he served with the militia. In 1822 he entered the service of the House of Assembly of Lower Canada, and continued in the same post in the House of Assembly of United Canada. He was a great collector of books and had got together some 1600 volumes, chiefly relating to Canadian history. These were burnt in the Parliament House fire in 1849. He, however, began a second collection, to promote which he was sent by the House to Paris. There he met with every assistance from the authorities, till the revolution of the 2nd of December upset society, and made so great an impression on the nerves of Mad. Faribault, that she shortly died from the consequences. Mr. Faribault was also for some time unfit for work. He nevertheless persisted, on a partial recovery of health, and returned to Canada. Here he resigned his place in the House and received the grant of a pension of £400 a year. He, however, still devoted himself to Canadian history and antiquities, and was a chief promoter of the monument which on the hundredth anniversary of the battle of the Plains of Abraham, was erected to Montcalm in the Chapel of the Ursulines.—*Montreal Herald*, 28th Dec

#### MISCELLANEOUS INTELLIGENCE.

*New Railway Bridge over the Thames.*—The great railway bridge which is designed to carry the traffic direct from the Victoria station at Pimlico has been completed, and was opened on Thursday for the regular transit of trains, more than 400 of which will pass over it daily. It is 310 yards long, 110 feet wide, bearing eight lines of rails. It is 52 feet wider than is Westminster bridge. The weight of iron in superstructure and cylinders, &c., is estimated at about 3,000 tons; 100,000 cubic feet of stone has been used, 16,600 cubic feet of brickwork and about 300,000 cubic feet of timber.—*Il*.

—A Paris correspondent says. We are now about to send to Westminster Abbey from Fontevault all literally that remains of the Kings and Queens of England. Westminster Abbey however is not likely to be much enriched by these mortal spoils, for the *Phare de la Loire* says. There probably will be found at Fontevault no actual remains of Henry II. Richard I, or Queen Eleanor of Aquitaine, for like those of St. Denis the tombs of Fontevault have been violated. The bones of Cœur de Lion were not more respected than those of St. Louis, but the tombs have been restored and the figures are almost uninjured. They are recumbent figures with hands crossed over their chests. Those who have examined them declare that every known tradition of resemblance has been respected.—*Exchange*.

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