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On Teaching Natural Science in Schools.

BY J. M. WILSON, M.A., F.G.S., F.R.A.S.

WHAT ought to be the relations of Science and Literature in a liberal education, is onę of the most important questions which come before those who reflect on the theory of education. It is only lately that the question has been distinctly stated. No complete answer can yet be given. It needs no proof that the present state of education into which we have drifted is not satisfactory, and among its most marked defects is the neglect of science. This is equally the opinion of the many and of the few; and lately some valuable contributions have been made to public opinion on this point by Mill, and Thirlwall, and others, to whom this neglect is a matter of astonishment and regret. I shall not attempt an essay on the relation of science and literature in human culture in general; nor the effect of scientific method on the minds of scientific men; nor can I touch on the proper position of these studies at the universities. It is with school education alone that I am concerned at present. I intend in the following pages to put forward some reflections on teaching natural science in schools that occur to me after having been occupied for eight years as a mathematical and natural science master at Rugby School. What I may have to say will not indeed come with the weight that attends the words of some previous writers on this subject, but it comes from an entirely different point of view, and from one who has at least honestly endeavoured to form his theories by experience and reflection, and to put his theories into practice.

I shall endeavour, therefore, to state distinctly some of the reasons why it is believed that the introduction of some teaching of science into schools is so very desirable as its advocates hold it to be; to meet some of the ojections that are urged against it; to make some suggestions as to the spirit and method of the teaching of science at schools, a subject on which there is much misconception; and to add some reflections on the obstacles that retard improvement in school education and the probable results of a more general cultivation of science.

Few will deny that the present results in our classical schools are not very satisfactory. The astonishing ignorance of Latin and Greek, or at least of all the finer part of this knowledge on which so much stress is laid; and the ignorance—which is less surprising, if not less lamentable—of everything else, with which so many boys leave most schools, has been dwelt on again and again. Is it remediable or is it not? Is it due to the carelessness and inability of masters; to the inherent unsuitability of the subjects taught; to neglected early education and bad preparatory schools; or to the illiterate tone of the society in which boys are brought up; to excessive novel reading and devotion to the games; or to the great fact that the majority of the species are incapable of learning much? Partly perhaps to them all; certainly to an ill-advised course of study. For at present, literature, or the studies which are subordinate to it, has almost a monopoly: and on language the great majority of boys fail in getting much hold. The exclusive study of language at schools weakens the fibre of those who have genius for it, fails to educate to the best advantage the mass who have fairly good sense but no genius for anything, and obscures and depresses the few who have special abilities in other lines; and it precludes the possibility of learning much besides. So that even at a school where classics are well taught, where the masters are able and skilful, and the boys industrious, not very much is learnt. It was said of a Scotchman who enjoyed a cheap reputation for hospitality, "that he kept an excellent table, but put a verra leetle upon it." This epitomizes the report of the Public Schools Commission: the schools are excellent, but they teach "verra leetle." And this is the less excusable because the experience of the best foreign schools is showing the advantage of study. A wider net is cast; fewer minds repose in unstirred apathy; more varied abilities are recognised; there is less over-estimation of special branches of knowledge; and, what is of more importance, the variety itself seems to be a stimulus.

And if the extension of the school curriculum is not absolutely forbidden by an appeal to reason or to experience, the claims of science to become recognised as a branch of liberal education are exceedingly strong. For, in the first place, most boys show a degree of interest in their scientific work which is unmistakably greater than in any other study. I am no advocate of a theory of education in which boys should learn nothing but what they show a taste for. I hold this to be a pestilent heresy. It would be worse than allowing children to eat whatever they pleased, because the mischief is more irreparable and the detection of it longer delayed. The thing that is valuable in all education is effort; and it is an advantage which science possesses that the interest that boys take in it induces them to make efforts in its study. If it were less interesting it would be right to teach it. I utterly repudiate the notion that a lecture ought to be made interesting, and merely observe that it happens to be so, and that it therefore secures an amount of attention and active thought which is very difficult to get on other subjects. The excitement, and interest, and competition in games make boys endure and enjoy an amount of fatigue and pain that they would naturally shrink from; and this fatigue and pain are the means by which they win the *corpus sanum*. The *mens sana* must be sought by similar efforts and pain; and if an interesting subject induces efforts, then, and then only, is its interest a merit. The temple of knowledge in the apologue had twelve gates, and the student had but one key given him to open them all. This master key is the power of active thought. And it is perhaps worth remarking, that since the introduction, three years ago, of a little natural science into our school course at Rugby, there has already been noticed an increase generally of what is described by different and acute observers as docility, love of work, aptitude for attention, grasp, power of seeing the point, in the average material of which our classical forms are composed. It is in fact an increase of mental activity and logical power. This is due to three causes which simultaneously began to operate,—to our system of superannuation, which prevents the existence of aged ringleaders of idleness in the forms; to the entrance examinations, by which a few very idle boys are rejected who would in former times have been admitted; but it is also commonly and reasonably attributed in a still greater degree to the study of natural science, a new and positive influence which has begun to operate.

And again, there are mental instincts just as there are bodily instincts. The bodily instincts anticipate the experience of physicians and experiments of physiologists, and are their guide to the treatment of the body; but the mental instincts, which are even more important, are nevertheless almost ignored in the art of education. One of these instincts is curiosity. It is a mental phenomenon which the skilful master studies, a power which he turns to account in the education of the boy. It is the one principle that makes self-education possible. It is a form of the love of knowledge; and when it concerns natural objects we call it curiosity, and half despise it. That it is often weak and unaccompanied with effort, I admit. But it is often altogether repressed—" little boys should not be curious:" whereas it ought to be guided, stimulated, and strengthened. The guidance of curiosity is to lead a boy to observe more, to combine, to reason. The stimulation of it is to show how much more there is still to be learnt. The strengthening of it is to make it deep and lasting; to check the mere love of novelty, the idle discursiveness that asks disconnected questions, and forgets, even if it waits for, the answer; and to refuse information till the foundation is laid on which it can securely rest. Guidance often takes the form of repression. Curiosity is the ordinary form of activity in a young mind, and it is unnatural and foolish to ignore it as we do. There is a fine passage on this subject in Goethe's "Hermann and Dorothea," which I shall make no apology for quoting at length. If any one despises this power in a child's mind, I ask him to weigh these words. The village apothecary had been blaming the curiosity which led all the people out to see the sad procession of exiles pass near the town—

> " Unverzeihlich find ich den Leichtsinn: doch leight er im Menschen;"

and to him, the wise and intelligent pastor, experienced in life and well versed in learning, replied—

> " . . . Ich tadle nicht gerne was immer dem Menschen.
> Für unschädliche Triebe die gute Mutter Natur gab;
> Denn was Verstand und Vernunft nicht immer vermögen, vermag oft
> Solch ein glücklicher Hang, der unwiderstehlich uns leitet.
> Lockte die Neugier nicht den Menschen mit heftigen Reizen,
> Sagt! erführ er wohl je, wie schön sich die weltlichen Dinge
> Gegen einander verhalten! Denn erst verlangt er das Neue,
> Suchet das Nützliche dann mit unermüdetem Fleisse;
> Endlich begehrt er das Gute, das ihn erhebet und werth macht."

And where this curiosity exists in boys it is almost exclusively directed towards external objects, and may be best cherished and ennobled into a genuine love of knowledge by guiding it to find some food in natural history and science. How much better and more intelligent would early training be if curiosity were looked on as the store of force, the possible love of knowledge in embryo in the boy's mind, which in its later transformations is so highly valued. "For our incitement,—I say not our reward, for knowledge is its own reward,—herbs have their healing, stones their preciousness, stars their times."

And even if scientific knowledge were not selected by a boy's natural interest and curiosity, yet let us reflect for a moment on its dignity and grandeur. This is no mean, and peddling, and quibbling knowledge, as the ignorant believe; it is the key to the possession of the loftiest ideas. We count a man educated in proportion to the exactness, width, and nobleness of his ideas. What is needed to elevate a man's intellectual nature is not that he should be an encyclopædia, but that he should have great ideas. And these must be based on knowledge. They do not, indeed, always accompany knowledge. Great ideas may be got by various studies, and all studies may be pursued by men who fail to gain great ideas. I know men with a wide and microscopic knowledge of history who know nothing of the love of freedom, of national justice, of the progress of the world, of the power of genius and will;—men who are theologians by profession, whose thoughts still revolve in the narrowest circle of earthly prejudices;—scholars indifferent alike to literature and learning. And so there are scientific men who combine poverty of intellect with width of knowledge. A botanist may be as foolish as a crest collector; a geologist, and even an astronomer, may, perhaps, be a pedant not more ennobled by the sphere of his thoughts than a cathedral spider is affected by the majesty of his abode; but I will venture to assert, that the great thoughts and principles which are to be gained only by scientific knowledge are not only of a quality that increases the dignity of a man's mind, are not only intrinsically glorious and elevating, but are not inferior, whether we regard their effect on the intellect or on the imagination, to those which may be reached by other studies. And I am not speaking only of the discoverers in science. There is a special charm, indeed, and stimulating power in original research, in exploring new regions; but there are splendid ideas, magnificent points of view, which, though others have reached them before, yet to attain is a life-long pleasure. The ordinary tourist may climb to some well-worn spot in the Alps, he may ascend by the beaten track, he may even be carried there, and yet he will be richly rewarded by the view that unfolds itself before his eyes. He may not feel the glow of health, the buoyant soul of the first mountaineer that stood there; but he will see what he will remember for ever; he will get more than a new sensation, he will have enlarged his soul. So to be the first to climb, as Newton did, with solitary steps to the untrodden heights from which he gazed on the solar system spread out at his feet, can never again be given to mortal man; but to attain the knowledge, to see the magnificent orderliness and progress, to be profoundly impressed with the infinities of space and time which it silently suggests, is to have gained a treasure that lasts as long as life will last. So also geology has a sublimity of it own, slowly reached by many steps and much toil. And, above all, the great ideas of natural law and harmonious adjustment can only be obtained by patient study in the fields of science; and are they not priceless to those who have in any degree won them? Who can contemplate our globe in this orderly system of the universe, with all the delicate adjustments that astronomy reveals, and all the splendid mechanism of the heavens—contemplate our atmosphere,—the distant sun darting its light and heat and power on the globe, and fostering all the varied and beautiful animal and vegetable life, giving rise to winds and showers and fruitful seasons, and beauties of form and richness of colour, filling our hearts with food and gladness; who can know something of the inexorable sequences, see something of the felicitous combination of all the varied forces of nature that are employed,—and not feel impressed and awed by the view; not feel he is in the presence of a Power and Wisdom that as far transcends the power and wisdom of man as the universe surpasses a watch in magnitude?

" To see in part
That all, as in some piece of art,
Is toil, coöperant to an end "

is to see that which he who sees it not is as incapable of estimating as the deaf man is of judging of music, or the blind of enjoying the glories of a sunset. Such are some of the ideas which crown science, and it is not granted to us to attain them except by slow degrees. Step by step must the growing mind approach them; and to exclude from our schools the preliminary steps is to debar from the attainment of such ideas all whose leisure in after-life is so curtailed that they can never break ground in any fresh subject for thought or labour.

To be continued.

On the Ways in Which Mechanical Powers &c., Are Illustrated in the Vegetable and Animal Kingdoms.

(A paper read before the College of Preceptors London; by the Revd. S. Henslow. M. A., F. L. S.)

The paper, which I have the honour of reading to-night, does not profess to be of a high character; nor probably will it furnish much material for useful discussion. My object is simply to draw attention to a few of the exquisite contrivances and adjustments of nature, some of which (from the vegetable kingdom) have never yet been noticed as furnishing illustrations of the mechanical powers.

The animal kingdom is so well known to be replete with beautiful examples of levers, &c., that I shall only attempt to describe a few which seem to possess an especial interest.

Illustrations from the Vegetable Kingdom.—Before describing the mechanical actions as displayed in plants, it will be necessary to state briefly the structure of a flower, and the purposes of its several "*organs*"; so that those who may not already possess that knowledge, may have a clear understanding of their nature and functions.

If the blossom of a Sweet Pea be taken as a type, a brief inspection shows that the outermost *whorl* consists of a small green cup with five minute points on the margin. This constitutes the *calyx*, out of which the coloured parts called the *corolla* appear to rise. The five *petals*, which collectively from the corolla, are of different shapes and receive special names; the largest and uppermost is called the *standard*, the two lateral ones form the *wings*, while the two lowest and partially cohering petals form the *keel*.

Within the keel petals are the *stamens*. Each stamen consists of a thread-like *filament* supporting a two-celled *anther* at the summit. The anther contains a powder called *pollen*, which is the fertilizing agent of the flower. It will be noticed by a very careful examination, that there are in this flower ten stamens. Nine of them are united along the greater part of their filaments; the tips of which, however, and which support the anthers, remain free. One stamen only, lying along the upper side, is entirely free from the others; so that the nine filaments form a tube split along the upper edge, the single free stamen lying along the slit. If now the tube of stamens be carefully removed, they will be found to enclose the fourth organ of the flower, or the *pistil* better known in its subsequent growth as the *pod* full of *pease;* but at this early stage the pease are but rudimentary papillæ, projecting downwards within the cavity or *ovary* along its upper edge. They are now called *ovules.* Three parts of the pistil may be recognized: the broad and hollow part containing the ovules is, as just stated, called the *ovary;* the contracted and solid extremity curving upwards, is the *style;* and lastly, the extreme tip is called the *stigma.*

Now the point which must be borne in mind, though I must refer the reader to some elementary work on Botany (1) for further details, is that *the ovules will not be developed into seeds* (*i.e. pease*), *unless the pollen from the anthers be placed upon the stigma*, by which means the fertilizing power of the pollen is communicated, through the style, to each ovule individually, and which then becomes capable of development into on independent life-possessing seed.

There yet remains to explain the purpose of the following mechanical contrivances—and that is, what has been called *the intercrossing of distinct flowers.* It appears to be a universal law in nature, that continued self-fertilization is undesirable, if not prejudicial, by lessening the vigour of the plant's descendants. That, although there may be stamens and pistil in the same flower (though this is far from being universally the case), and thus secure the possibility, and even probability, of self-fertilization by the pollen reaching the stigma, yet the various mechanical contrivances, as well as all cases of *irregular* flowers, (*i. e.*, where the petals of the corolla are not all of the same form,) are probably adaptations to secure the agency of insects to transfer the pollen from one flower to another.

The Lever.—The examples which illustrate the lever are principally of the third kind; (2) though the genus *Salvia,* "sage" furnishes a most remarkable instance of the first.

In the great majority of plants of the *family* to which the Pea belongs, the flowers illustrate the third kind of lever; for the keel and wing petals are generally locked together by means of small projections on the former, which fit into depressions on the latter; while all four petals have slender supports or *claws*, by which they are attached to the base of the small cup-like calyx, and which form the long arms to the levers. If the point of attachment be regarded as the fulcrum, the resistance of the calyx the power, and an insect the weight; then, when it alights upon these petals, its weight immediately causes them to be depressed, and at the same time the stamens are exposed, the anthers come in contact with the insect, and the latter is dusted with pollen, which it transmits to the stigma of another flower by repeating the same process.

As illustrations, the following genera of the Pea family may be examined - Pea, Laburnum (species of Cytisus), Lupin, Melilot, &c.

In the Red Clover, a slight modification occurs, in that the margins of the standard petal are rolled round and unite below, so forming a tube, to which the claws of the wings and keel are attached, so that the lever is shortened into a sort of spring. The humble bee, which alone visits it, by standing on the "wings,"

(1) Prof. Oliver's "Lessons in Elementary Botany" (Macmillan) may be consulted with advantage.

(2) The Author assumes a knowledge of the simple mechanical powers on the part of the reader.

depresses these petals together with the "keel," to which they cling, and so exposes the stamens. (1)

Springs.—In some particular genera, the claws which act as levers partake more truly of the nature of springs;—this is conspicuously the case in the common Genista. When the flower is first open, the stamens and pistil are completely concealed within the keel; but if an insect insert its proboscis, or if a pin be thrust, in imitation of it, down to the base of the calyx, the flower suddenly bursts open, and the four claws, viz., of the two wings and of the two keel petals, curl violently downwards, so that, from having been horizontal, these petals drop vertically. The stamens are thus exposed, while the shock received bv the explosion assists in liberating the pollen. The same process occurs, though in this case the action of the spring is limited to the claws of the keel petals only, in the exotic genus Indigofera.

Lever of the first kind.—An instance of a lever of the first kind will be found in the genus Salvia, belonging to the family *Labiatæ* (in which are also the mint, thyme, amd lavender).

Here the petals of the corolla are united into one piece, and the *two* stamens adhere to it. A remarkable modification of them, however exists in this flower. The filament of each stamen is very short, while the anther has its two pollen-cells drawn asunder, and separated by a long stalk-like process called the *connective.* This is attached to the summit of the short filament (somewhat like the letter T), at a point nearer to one anther-cell than the other, and can oscillate in a vertical plane upon that point of attachment. Of the anther cells, one only, the upper, produces pollen. The other and lower, is spoon-shaped, and projects over the orifice leading to the base of the tube of the corolla.

The above contrivance thus constitutes two parallel levers of the first kind; their arms are of unequal length, are semi-circular, and oscillate in a vertical plane. The action is as follows. If an insect alight upon the expanded portion or *lip* of the corolla, which forms an excellent landing-place, it passes its head downwards into the tube, and strikes against the two spoon-shaped empty anther.cells which form the extremities of the two short arms of the levers. By depressing these, the long arms swing through a large arc of a circle, and bring down the anther-cells (charged with pollen), which then strike the insect on the back, and consequently dust it with a shower of pollen. On the insect retiring, the lever recovers its vertical position of equilibrium, and the fertile cells of the anthers retire into the groove of the upper portion of the corolla, which thus protects them.

The forked stigma of the pistil, which projects considerably beyond the flower, will then be seen to be in the exact position for touching the precise spot on the back of the insect where the pollen of a *previous flower* had been deposited.

The Lever and Screw.—In the Scarlet Runner there is a combination of two powers, the lever and the screw. In this flower the keel petals, instead of being straight, have a right-angular bend, and their extremities twisted spirally. The pistil, which is included within them, has its style coiled in a corresponding manner. Just below the stigma is a tuft of hair upon the style. On looking at an expanded flower from the front, it will be noticed that the wing-petal on the left is smaller than the one on the right, and that the orifice of the spirally twisted keel projects over the left or smaller of the two wing-petals.

An insect, *e. g.* the hive bee always alights upon the smaller. These petals have peculiar grooves or depressions upon their inner surface, which catch corresponding elevations on the exterior surface of the keel. The result is, that by acting as the *power* of the lever, the weight of the insect depresses the smaller petal; the force is communicated by the grip-like action of this petal to the spiral keel, which, by being drawn down, causes the spirally twisted style to pass up the hollow coil, so that the stigma now protrudes out of the orifice of the screw-like extremity of the keel. The tuft of hair on the style, above alluded to, sweeps, in its passage outwards, the pollen from the cluster of anther-cells, through the centre of which it passes, and deposits it (the pollen) upon the back of the bee which is there ready to receive it.

(1) It may here be noticed that the hive bee only visits the white clover, its proboscis not being long enough to reach the base of the tube of the red clover.

(Concluded in next.)

Suggestions on the Teaching of History.

1. One of the prerequisites of success in teaching history is, that the instructor should have a fuller knowledge of the subject than can be obtained from the text-book only. He ought to be familiar with the story in its completeness, as told by one or more of the best authors.

2. The lesson assigned for the next recitation, should be at once read with as much care as the regular reading lesson, all the proper names being carefully and correctly pronounced.

3. The map showing the location of all the places mentioned, should be drawn by all the pupils of the class, and, when the lesson is about to be recited, one of the scholars ought to draw on the blackboard, with a free hand, an outline of the map, and mark the location of the places mentioned in the lesson.

4. In hearing the lesson, the teacher should stand, not sit, without any book, so that he can look straight into the eyes of those he is questioning, and thus be in full sympathy with them. He should have such knowledge and grasp of the subject as to enable him to put questions without reference to those in the book, which are there to aid the scholar, not the teacher, by pointing out and calling attention to important facts.

5. The lessons of any period should not be considered as completely mastered until they have been reviewed both chronologically and geographically.

6. A few prominent events should be selected as stand-points from which, on the one side, may be seen a train of causes, and on the other, a series of effects or consequences.—*J. J. Anderson.*

Autumn Woods.

Ere in the northern gale,
The summer tresses of the trees are gone
The woods of Autumn, all around our vale,
Have put their glory on.

The mountains that enfold,
In their wide sweep, the coloured landscape round,
Seem groups of giant kings in purple and gold,
That guard the enchanted ground.

I roam the woods that crown
The upland, where the mingled splendours glow,
Where the gay company of trees look down
On the green fields below.

My steps are not alone
In these bright walks; the sweet south-west, at play,
Flies, rustling, where the painted leaves are strewn
Along the winding way.

And far in heaven, the while,
The sun that sends the gale to wander here,
Pours out on the fair earth his quiet smile
The sweetest of the year.

O Autumn! why so soon
Depart the hues that make thy forests glad;
Thy gentle wind and thy fair sunny noon
And leave thee wild and sad.

Ah, 'twere a lot too blest
For ever in thy coloured shades to stray;
Amidst the kisses of the soft south-west
To rove and dream for aye;

And leave the vain low strife
That makes men mad, the tug for wealth and power,
The passions and the cares that wither life,
And waste its little hour.

BRYANT.

Picture of Autumn.

When Autumn, bleak and sun-burnt do appear,
With its gold hand gilding the fallen leaf,
Bringing up winter to fulfil the year,
Bearing upon his back the ripened sheaf;
When all the hills with woody seed are white,
When levying fires, and lemes, do meet from far the sight;
When the fair apple, rudde as even sky,
Do bend the tree unto the fructile ground,
When juicy pears, and berries of black dye,
Do dance in air and call the eyne around;
Then, be the even foul, or even fair,
Me thinks my heartes joy is stained with some care.

CHATTERTON.

History of Canada.

JACQUES CARTIER'S FIRST VOYAGE TO CANADA.—THE SAVAGES.

1. Jacques Cartier was a famous sea-captain of St. Malo, in France, and lived in the reign of King Francis I.

Francis was jealous of the king of Spain, whose subjects were gaining wealth and fame in the newly found lands beyond the Atlantic Ocean. He therefore sent out Cartier, with two ships, and 120 men, with orders to seek some passage, westwards, to Japan, China, and the East Indies.

2. Cartier sailed from St. Malo in April, 1534. After a voyage of three weeks he reached Newfoundland. Thence he passed round, by way of the straits of Belle-Isle, into the Gulf of St. Lawrence, and across to the mainland of North America. On the way, the islands, now called *Magdalen Islands*, were visited. One of these, named *Bryon's Island*, seemed to Cartier to be "worth more than all Newfoundland. There were large trees, meadows with wild corn, peas in flower, and grape vines, with strawberries, red roses, thyme and other strong smelling herbs." On another of the islands his people landed, and killed more than a thousand birds. These creatures were so plentiful, that, in the space of an hour, they could have had enough of them to fill 30 large boats.

The first part of the mainland seen by Cartier is thought to have been that which is now *New-Brunswick*, near the mouth of the river *Miramichi*.

Afterwards he came to *Gaspé*, where he landed. It was the month of July, and, on account of the great heat, he named that part the "*Baie des Chaleurs*."

3. Cartier spent some time in seeking a passage through which he might pass on westwards.

Finding none he prepared to leave.

4. On July 26th, Cartier caused a wooden cross, 30 feet high, to be raised as a token that the king of France was now master of that region. The cross had the king's name cut out upon it. There were savages near by, looking on. Cartier told them, by signs, not to meddle with the cross. To move their feelings of fear and wonder, and to give them a notion of French power, he caused guns to be fired.

He gave them as presents small pieces of glass, beads, crosses, hatchets, and little looking glasses. To shew their joy, the Savages danced around, the men on one side, the women on the other.

5. When all was ready for leaving, Cartier enticed the chief of the savages to come near his boats. Two of the old man's sons were then suddenly seized and carried on board ship. Cartier then sailed away with his captives.

We cannot praise Cartier for this action, although his intention was good, and although the like was often done in those days. His object was to have the young men taught the French tongue, so as to become of use afterwards, as *interpreters*, between him and the savages.

Cartier, when he sailed from the coast of Gaspé, made the Savages on shore to understand that he would come back and restore the chief's sons.

6. He then went northwards as far as the Island of Anticosti, and beheld the mouth of the river St. Lawrence, but thought that this was only a large bay.

It was now late in the season, and the weather became stormy. Cartier took counsel with his officers and pilots, when it was agreed to return to France. About the middle of August they set sail, and steered eastwards, for home. On September 5th, Cartier, with his men and ships all safe, reached his native port, St. Malo.

Thus ended the first voyage to Canada.

JACQUES CARTIER'S SECOND VOYAGE.—THE ST. LAWRENCE.—STADACONA.—HOCHELAGA.

7. Cartier, having landed at St. Malo, went at once to Paris, to give an account of his voyage to the king. He shewed, at Court, his two captives. whose names where *Taiguragny* and *Domagaya*. He also spoke of the good lands he had seen in the west, and of the beautiful trees and flowers which grew there. He said that there must be other lands to be found, having, perhaps, gold and silver, of which the Spaniards were then finding so much in Mexico and Peru. He stated his hopes of proving, by another voyage, that there was a passage through to *Cathay*, which was then the name given to Japan and China.

King Francis and his courtiers were well pleased with Cartier's report, and orders were given to prepare for making another voyage.

During the winter every thing was made ready for Cartier's second voyage to the West. This time, three ships, the *Great Hermine*, the *Little Hermine*, and the *Emérillon*, were fitted out. Plenty of food, guns, and other necessaries were stored on board. Besides the crews of sailors and pilots, needed for the ships, a number of young gentlemen had leave to go. The hope of these, was, to be fortunate, like the Spaniards, in gaining fame, as well as gold, silver, and precious stones. When the preparations were finished, Cartier, and those who were to sail with him, went together to church, at St. Malo, to crave the blessing of heaven. On the following Wednesday, May 19th, 1535, they started on their voyage with a fair wind.

Taiguragny and Domagaya were on board the Great Hermine, with Cartier, They had made some progress in the French language, so that they were able to be of use as interpreters, and in other ways.

8. After a stormy voyage of nearly 10 weeks, the ships arrived safe at *Blancs-Sablon*, a harbour on the south shore of Labrador, beyond the entrance of the straits of Belle-Isle into the gulf of St. Lawrence. Then they sailed between Anticosti and the mainland, towards the mouth of the great river which Cartier had thought was only a bay. When they came beyond Anticosti, *Taiguragny* and *Domagaya*, knew where they were. They told Cartier that he was near the mouth of the river of *Hochelaga*, of which no man knew the extent, and that it led through the "*Kingdom of Saguenay*." Cartier was pleased with the news. Passing on boldly, he sailed up the river, now known to us all by the name of the *St. Lawrence*. He felt more sure than before that he had found a passage which would lead to *Cathay*. Savages were seen moving along the banks and on the stream, in canoes. These beheld the French ships with wonder, thinking that they were very large canoes with wings.

9. The mouth of the river Saguenay was reached on Sept. 1st. There, Taiguragny and Domagaya, in Cartier's ship, talked with savages who came near.

On Sept. 6th, the ships cast anchor in the channel between the Island of Orleans and the north shore of the St. Lawrence. Next day, after the savages had brought presents of maize, melons, and fish, twelve large canoes, arrived, filled with people. The chief of the country, *Donnacona*, had come to pay Cartier a visit.

10. Donnacona made a long speech, which Taiguragny and Domagaya said was to welcome Cartier, and to thank him for the good treatment his two captives had met with in France.

Small presents were made to the people with Donnacona. To the chief himself, and those in his own canoe, bread and wine were given. So, the first meeting between the French, and the principal persons of the country, was very friendly indeed.

11. Cartier judged that he and his followers must spend the winter not far from where he had met Donnacona. He therefore brought his ships to the upper end of the Island of Orleans, to which he gave the name of the "*Isle of Bacchus*, on account of the wild grapes which were seen growing there. Then he passed nearer to Cape Diamond, and found a good place within the mouth of a small river running into the St. Lawrence. The river, now named *St. Charles*, was called by Cartier, *St. Croix*. The two larger vessels were safely moored, and men set at work to make them safe from all attack, in case the natives should become unfriendly. We shall see that Cartier had cause for being careful.

His smallest ship, the Emérillon, was kept outside, as it was intended to go in higher up the river St. Lawrence.

12. Near to the river St. Croix, the Indians had their principal settlement. It was called *Stadacona*.

On Sept. 17th, the natives of Stadacona, headed by Donnacona, came down to the bank near Cartier's ship. Another long speech was made by the chief, who also presented the French captain with three young savages. Cartier, in return, gave him two swords, and some brass vessels. The Indians danced around, and sang, according to their fashion. Then 12 discharges of cannon were fired. We can easily believe what we are told of the effects upon the minds of Donnacona and his warriors. They thought the very heavens were about to tumble down upon them, which made them take to shewing their feelings by howls and loud cries.

13. Two days later, Cartier chose about 50 of his followers to go with him, in the Emérrillon. He wished to visit anoher Indian town called *Hochelaga*. He was told that it was not safe to venture up the river so far, and that those who went would perish. In fact, Donnacona tried to prevent Cartier from going. But the pious French captain would not be guided by him, and said that "God would guard all true believers from all danger."

However, Taiguragny and Domagaya pretended to be afraid, and said they would stay with Donnacona rather than go with Cartier to Hochelaga. These two young men were far from being true to the French.

14. On Sept. 19th, Cartier began his passage to *Hochelaga*. As the Emérillon and two barges moved up the river many savages were seen on the banks. They did not appear to be unfriendly.

In that part of the river, now called *Lake St. Peter*, the Emérillon several times ran a ground. Cartier's party, therefore, finished their passage in two barges. About a forthnight was spent on the way to Hochelaga.

15. This Indian town was found to have about one thousand inhabitants. It was near the site of the modern city of Montreal.

HISTORY OF ENGLAND.

The Sovereigns of England.

THE EARLY KINGS.

We know very little of the kings who ruled in Britain before the Romans, led by Julius Cæsar, invaded the country; but we read that they fought very bravely, and that some of them were taken to Rome as captives. The Romans stayed in Britain for about 400 years; but in the year 428, the Emperor Honorius, being greatly troubled in his own country, sent for all the Roman soldiers who were in Britain, and they never came back again. The people of the southern part of his country, being left to themselves, chose several kings, who quarrelled very much among themselves, and several of the kings were murdered. At length they agreed that Vortigern should be the King of South Britain. Ever since the Romans had left, the Picts and the Scots, who lived in the north country, which we now call Scotland, had been in the habit of coming into England, robbing and killing; and as the Britons were not able to resist them, King Vortigern asked some of the principal Saxon tribes, called Saxons, Danes, and Jutes, who inhabited Germany and Denmark, to come over and help to drive back the Picts and Scots. The Saxons thought that they should like to come to such a fine country as England, and two of their chiefs, Hengist and Horsa, landed with an army on the Isle of Thanet, in Kent. They were soon followed by others; and in the year 450, twenty-two years after the Romans had left, King Vortigern married Rowena, the niece of Hengist, and made that chief King of Kent. The Britons soon found that they were worse off with the Saxons than they had been with the Picts; for those who came to help wished to be masters, and when asked to return to their own country, refused, and defeated the Britons in several battles. For about 130 years there was terrible fighting. Some of the British chiefs, especially, it is supposed, Arthur, about whom and his Knights of the Round Table so many interesting stories have been told, fought very bravely against the Saxons; but their courage was useless, for fresh armies contintually arrived, and at length the Britons were driven into Cambria (now called Wales) and Cornwall, where for several hundred years they struggled as well as they could to keep their freedom. About the year 585 the Saxons, having conquered all the rest of the country, agreed to give the name of England, that is, the country of the Angles, to the seven kingdoms—Kent, the South Saxons, the West Saxons, the East Saxons, Northumberland, East Anglia, and Mercia—which they had established. Northumberland was afterwards, for some time, divided into two kingdoms, Deira and Bernicia; but the seven kingdoms first established were known as the Heptarchy. It generally happened, however, that one king was stronger than the others, and so was ca''ed King of England, or the Bretwalda, an old word meaning the same thing. The names of the kings who were so so called were Hengist, King of Kent; Ella, Cerdic, Kenrick, and Ceaulin, Kings of the West Saxons; Ethelbert, King of Kent; Redwald, King of the East Angles; Edwin, Oswald, and Oswy, Kings of Northumberland; Wolfhere, Ethelred, Kenred, Ceolred, Ethelbald, Offa (who was born lame, deaf, and blind), Egfryd and Renwolfe, Kings of Mercia; and Egbert, King of the West Saxons. This last king was so powerful that he subdued the rest, became the first sole king of all England, and was solemnly crowned at Winchester in 827.

In the year 596 the Pope sent Augustine to teach Christianity in England, where the people except some of the native British, who, in Wales and Cornwall, preserved the Christian faith—were sad heathens. He was well received by Ethelbert, King of Kent, whose wife, Queen Bertha, daughter of Chilperic, King of France, was a Christian, and had a little church, which still stands, wear Canterbury. Augustine converted the king and many of the nobles, and in the course of a few years all the kings of the seven kingdoms professed to be Christians, and abolished the worship of Odin and Thor, and the sun and moon, which they had practised.

Soon after Egbert had united all England into one kingdom, there came a new trouble,which for nearly 200 years kept England in a state of war, and caused such terrible doings that we would rather not relate them all in full. The Danes—that is, the people of the countries now known as Denmark and Norway—had long watched with envy the success of the Saxons in this country, and being a very brave race, and used to the sea, they determined to invade England, drive out the Saxons, and obtain the country for themselves. The "sea-kings," as they were called, had made themselves very terrible to the other northern nations, for they would send their ships suddenly to parts of the coast where the people were rich, and land warriors, who murdered the inhabitants and carried off their wealth. They had, before Egbert was crowned, twice visited in this alarming manner the English coasts; and soon after he was King of all England, made their appearance in great force in Dorsetshire, and were not driven back until after a great battle. Egbert died in 838, having been twenty-six years King of the West Saxons, and ten years King of England; and was succeeded by his son Ethelwolf who, dying in 857, was followed on the throne by his four sons in this order: Ethelbald, Ethelbert, Ethelred I., and Alfred the Great. During their reigns there were frequent battles with the Danes, who landed many times, and several severe battles were fought, respecting which we shall say something when we are writing about Alfred. Edward the Elder was the eldest son of Alfred, and succeeded to the throne; and Athelstan, Edmund I., and Edred, three of his sons, were the next kings. Then came Edway and Edgard, sons of King Edmund, and Edward II., son of Edgar, generally called the Martyr, because he was murdered at Corfe Castle, Dorsetshire, by his step-mother, Queen Elfrida, who, however afterwards professed great penitence, and shut herself up in a nunnery for the rest of her days. Edward's half-brother, Ethelred II., succeeded him; and in his reign the Danes were so troublesome that he was glad to pay them very large sums of money to keep them away. This tribute was called the Danegelt, or the Dane's gold. Two very powerful Danish chiefs, Sweyn and Canute, several times landed and subdued a great part of the kingdom. Sweyn was proclaimed King of England, but was killed at Thetford, in Norfolk, and Canute was also proclaimed king; but Ethelred was able to regain his throne. After his death, his son Edmund II., or Ironside, was proclaimed king in one part of England, and Canute in another; and after several battles they agreed to divide the kingdom. When Edmund died, Canute succeeded to the throne. His sons, Harold I. and Hardicanute, were the other Danish kings; and then Edward III., the Confessor, seventh son of the Saxon King Ethelred, was chosen to be king. He promised William, Duke of Normandy, that he should be his successor; but when he died, in 1066, Harold, son of Godwin, Earl of Kent, a very powerful nobleman, and much liked by the people declared himself king, and was crowned at Oxford. The Duke of Normandy was determined to assert his right, and landed with a large army at Pevensey, in Sussex. Harold opposed him, but was killed at the battle of Hastings, on the 14th of October, 1066; and Duke William, thenceforth called William the Conqueror, became King of England.

ALFRED THE GREAT.

Born at Wantage, in Berkshire,, 849. Died at Farrringdon, in Berkshire, 901. Reigned 33 years.

There is no king of England of whom we are all prouder than Alfred. When only five years old he was taken by his father to Rome, and there probably gained that love for learning which through his life he exhibited. During the reign of his brother, Ethelbert, the Danes frequently ravaged the country; and when Ethelred was king, young Alfred, then only seventeen years of age, assisted him in his efforts to drive them out of the country. There were nine great battles in one year, in most of which Alfred was engaged; and there may still be seen, rudely cut out of the chalk on a hill-side in Berkshire, an immense figure of a horse, which keeps in remembrance a great victory which Ethelred and Alfred obtained over the Danes at that spot. The white horse was painted on the Saxon standard, as a raven was on the Danish; and the valley at the foot of the hill is still called the Valley of the White Horse. Alfred was twenty-two years old when he became king, and was crowned at Winchester in 868. In less than a month afterwards he was obliged to take the field against the Danes, and for several years was almost continually fighting with them. In one year he fought seven battles, was wounded, but recovered, and again attacked the Danes. At one time he was compelled to hide himself, in disguise, in the Isle of Aldersey, in Somersetshire, and was, it is said, struck by the wife of a herdsman, in whose cottage he had taken refuge, for allowing some cakes to burn. Another time, in the dress of a harper, he entered the Danish camp, and, being very skilful in music, they were so pleased with him that he contrived to obtain a great deal of information about their strength; and then, collecting his friends, he attacked and defeated them. Altogether, he is said to have fought fifty-six battles with the Danes, by sea and land. He was a very wise and good king; encouraged learning; founded, as is said, the University of Oxford, so that those of his people who wished might be well educated; made many good laws; rebuilt London, which had been nearly destroyed by the Danes; established regular government in many parts of the kingdom where the people had been ill-treated; made the division into counties; and was such an excellent ruler that when he died everybody agreed that he ought to be styled, as he still is, Alfred the Great.

A Geographer's View of 1869.

Judge Daly, the President of the American Geographical and Statistical Society, in his last address to the society, enumerates the following events as making 1869 a memorable year: 1. The connecting of the North Atlantic with the Pacific Ocean by rail. 2. The completion of the canal across the Isthmus of Suez. 3. The exploration and discoveries in South-eastern and Equatorial Africa. 4. The additional evidence now brought to light of a climate in the ice-bound regions of the Arctic, at a past and remote period of time, ressembling that of the countries lying near the equator. The marvellous results of the deep-sea dredging of Professors Thompson and Carpenter, revealing the existence of animal life at enormous depths of the ocean, where we should have supposed the existence of life to have been impossible. 6. The very general disturbances throughout the year of the earth's surface by earthquake, distinguishable not so much for its effects in particular localities as for the distribution of the phonomena over the globe, and its appearance in parts of the world where such disturbances have never been previously witnessed within the memory of man. 7. The attractive power of mountains discovered in the pendulum experiments made during the past year at the observing stations upon the Himalayas in India. 8. The discovery through the spectroscope of a method of determining the proper motion of the stars, and the fact that the physical and chemical construction of the whole stellar universe is identical. 9. The invention and successful practical use of a self-registering compass, by which every motion of a vessel can be recorded and preserved from the beginning to the end of her voyage. 10. The discovery of trees of enormous height and magnitude in Australia, one of which was found to be sixty-nine feet in circumference. 11. The discovery of great deposits of coal throughout the whole of New Zealand, and the finding of coal upon the borders of the Caspian Sea, verifying in this last particular a prediction of Humboldt's, both of which discoveries are of the highest importance to commerce. 12. The anthropological researches in Europe, Asia, and Africa, revealing the structure and mode of life and customs of the earliest inhabitants of the earth. 13. The passage and escape of the American ship Congress, last August, through a cyclone of extraordinary intensity and power, in the Atlantic, under circumstances which afford a great deal of information and movement in this terrible phenomenon of the ocean.

Age.

As the follies and vices of youth are chiefly derived from inexperience and presumption, so almost all the errors of age may be traced up to the feebleness and distresses peculiar to that time of life. Though, in every part of life, vexations occur, yet, in early years, either business or pleasure served to obliterate their impression, by supplying occupation to the mind. Old age begins its advances, with disqualifying men for relishing the one, and for taking an active part in the other. While it withdraws their accustomed supports, it imposes, at the same time, the additional burden of growing infirmities. In the former stages of their journey, hope continued to flatter them with many a fair and enticing prospect. But in proportion as old age increases, those pleasing illusions vanish. Life is contracted within a narrow and barren circle. Year after year steals somewhat away from their store of comfort, deprives them of some of their ancient friends, blunts some of their powers of sensation, or incapacitates them for some function of life.

Though, in the plan of Providence, it is wisely ordered, that, before we are called away from the world, our attachment to it should be gradually loosened; though it be fit in itself, that, as in the day of human life there is a morning and a noon, so there should be an evening also, when the lengthening shadows shall admonish us of approaching night; yet we have no reason to be surprised, if they, who are arrived at this dejecting season, feel and lament the change which they suffer. The complaints, therefore, of the aged, should meet with tenderness, rather than censure. The burden under which they labour ought to be viewed with sympathy, by those who must bear it in their turn, and who, perhaps, hereafter may complain of it as bitterly. At the same time, the old should consider, that all the seasons of life have their several trials allotted to them; and that to bear the infirmities of age with becoming patience, is as much their duty, as is that of the young to resist the temptations of youthful pleasure. By calmly enduring, for the short time that remains, what Providence is pleased to inflict, they both express a resignation most acceptable to God, and recommend themselves to the esteem and assistance of all who are around them

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Old age never appears with greater dignity, than when, tempered with mildness and enlivened with good humour, it acts as the guide and the patron of youth. Religion, displayed in such a character strikes the beholders as at once amiable and venerable. They revere its power, when they see it adding so much grace to the decays of nature, and shedding so pleasing a lustre over the evening of life. The young wish to tread in the same steps, and to arrive at the close of their days with equal honour. They listen with attention to counsels which are mingled with tenderness, and rendered respectable by gray hairs. For, notwithstanding all its presumption, youth naturally bends before superior knowledge and years. Aged wisdom, when joined with acknowledged virtue, exerts an authority over the human mind, greater even than that which arises from power and station. It can check the most forward, abash the most profligate, and strike with awe the most giddy and unthinking.

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In order to make the two extremes of life unite in amicable society, it is greatly to be wished that the young would look forward, and consider that they shall one day be old; and that the old would look back, and, remembering that they once were young, make proper allowances for the temper and the manners of youth.—*Blair.*

OFFICIAL NOTICES.

Ministry of Public Instruction.

APPOINTMENTS.

SCHOOL INSPECTOR.

By an Order in Council dated the 15th June last, the Lieutenant-Governor was pleased to appoint Joseph A. McLoughlin, Esquire, School Inspector for the District of Bedford, in place of Dr. Rotus Parmelee, resigned. M. McLoughlin is to have charge of the Protestant Schools of the Counties of Shefford, Brome and Missisquoi.

M'GILL NORMAL AND MODEL SCHOOLS, MONTREAL.

The Lieutenant-Governor, by an Order in Council dated the 12th ult., was pleased to accept the resignation of Sampson Paul Robbins, Esq., M.A. Ordinary Professor in the McGill Normal School, and at the same time to make the following appointments, namely;—Sampson Paul Robbins, Esq., M. A., to be Associate Professor of Agriculture and Natural History in the McGill Normal School; James McGregor, Esq., M. A., to be Ordinary Professor in the McGill Normal School in the room and stead of Professor Robbins, resigned; Francis Hicks, Esq., M. A., to be Director of the Boys' Model School, in connection with the McGill Normal School, in the room and stead of James McGregor, Esq., M. A., resigned.

JACQUES CARTIER NORMAL SCHOOL, MONTREAL.

The Lieutenant-Governor by an Order in Council dated 31st ult., was pleased to appoint M. Joseph Godin, Associate Professor in the Jacques Cartier Normal School, in the room and stead of Mr. Arthur Duval, resigned.

The Lieutenant Governor, by an Order in Council dated the 27th of July last, was pleased to appoint the following gentlemen, School Commissioners:

City of Montreal:—The Revd. Donald Harvey McVicar to be a member of the Protestant Board for said City, and Louis Bélanger, Esq., Advocate, to be a member of the Catholic Board for said City.

City of Québec:—The Revd. James Neville, to be a member of the Catholic Board for said City, and Robert Smith, Esq., to be a member of the Protestant Board for said City.

The Lieutenant-Governor, by an Order in Council dated 31st ult., was pleased to appoint the following:

SCHOOL COMMISSIONERS.

Ouiatchouan, County of Chicoutimi:—Messrs. Jean-Baptiste Parent and Joseph Villeneuve to replace themselves.

Miguasha, County of Gaspé:—Mr. Alexander Sabillois to replace Mr. Archibald McEwen.

Valcartier, County of Quebec:—Messrs. William Goodfellow, Michael Maher, John Hopper Ireland, James Burns and Charles Fitzpatrick.

Ste Flavie, County of Rimouski:—Messrs. Pierre Giroux and Jean-Baptiste Saucier to replace Messrs. Jérôme Gagnon and Philippe Plante.

St. Paul d'Abbotsford, County of Rouville: Mr. François Brunelle to replace M. Olivier Patenaude.

Wolfestown, County of Wolfe:—The Revd. Mr. Napoléon Francœur and Mr. Francis Gormly to replace themselves.

St. François, County of Yamaska:—The Revd. Mr. Jules Paradis to replace Mr. Jean-Baptiste Maher, and Mr. Edouard Despins to replace himself.

SCHOOL TRUSTEE.

Village of St. Jean-Baptiste, County of Hochelaga: — Mr. Joseph Clarihue, Esq., to replace John Bridgeman, Esq.

ERECTIONS, ANNEXATIONS, SEPARATIONS, &c., OF SCHOOL MUNICIPALITIES.

The Lieutenant-Governor, by an Order in Council dated the 19th of July last was pleased

1. To unite Poste des Forges de St. Maurice and Fief de St. Maurice into one School Municipality under the name of Fief de St. Maurice;

2. To divide into two separate School Municipalities,—with the same limits as for Municipal purposes,—those of Buckland and Mailloux in the County of Bellechasse;

3. To annex, for school purposes, lot 28 of the second Range of East Chester in the County of Arthabaska to the Municipality of St. Norbert in the same County;

4. To annex, for School purposes, to the Municipality of McNider in the County of Rimouski, that portion of the township of Matane, in the same county, which extends from the land of Vilbon Gosselin, Esq, exclusively, running south as far as River Fortigon, thence following the south-west bank of said river to the line which separates the said Township of Matane from the Municipality of McNider,—comprising lots Nos. 1, 2, and 3 of the Second Range, which heretofore made part of the School Municipality of said township of Matane, as at present existing;—

5. To erect into a School Municipality the Parish of St. Hippolyte, in the County and District of Terrebonne, with the limits made known by Proclamation of the Lieutenant-Governor, of date the sixteenth of April one thousand eight hundred and seventy;

6. To detach from the Municipality of Kamouraska the land called *Pointe-Sèche*, and annex it to the Municipality of St. André in the same County;

7. To fix for school purposes, the following limits, between the Municipalities of St. Roch and Ste. Louise, in the County of l'Islet,—namely,—all the lands of the proprietors who have their domicile south of the Rail-Road, in the second Range, from the road to St. Roch Church as far as the Seigniorial line, shall form part of the Municipality of Ste. Louise as well as that portion of their lands lying North of said line. All the lands of the proprietors who have their domicile North of said line in the same range shall form part of the Municipality of St. Roch, as well as that portion of their lands lying South.

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The Lieutenant-Governor, by an Order in Council dated 31st ult., was pleased, by virtue of the powers conferred on him by Cap. 15, Clause 55, Consolidated Statutes for Lower Canada,

To annex, for School purposes, the North-East part, (commencing at lot 36 and running to the Townships of Denonville) of the Township of Viger, County of Témiscouata, to the School Municipality of St. Epiphane de Viger in the same county.

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The Lieutenant-Governor, by an Order in Council dated the 16th November last, was pleased to erect into a School Municipality, under the name of St. Jérôme du Lac St. Jean, the portion of each of the Townships of Caron and Metabetchouan, in the County of Saguenay, bounded as follows, to wit: North by Lac St. Jean; East by Belle-Rivière and Hébertville, commencing at lot 25, in the 1, 2, 3, and 4 Ranges of the Township of Caron, and at lot 58 in the North and South Ranges(A) of aforesaid Township; West by River Metabetchouan, and South by mountains and uncleared lands, serving as limits to the Fourth Range of the Township of Caron.

(The publication of this Order in Council in last December number of *The Journal of Education* to be considered as null and void.)

NOTICE.

Quebec, August 6th, 1870.

Notice is hereby given that the Dissentients of St. Joachim, in the County of Two Mountains, having had no school in operation for more than a year, either in their own Municipality or conjointly with other Trustees in a neighbouring Municipality, and that they are not taking any steps to carry out the school law, I shall recommend to the Lieutenant-Governor in Council that the Board of Trustees for the Dissentient Schools of said Municipality shall be declared dissolved, after the elapse of three months from the date of the present notice, in conformity with Sec. 16, Cap. 16, 32 Vic.

(Signed) P. J. O. Chauveau,
Minister of Public Instruction.

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DIPLOMAS GRANTED BY BOARDS OF EXAMINERS.

QUEBEC (CATHOLIC).

Session of May 3rd, 1870.

Elementary School Diploma, (F.) *1st Class*: — Misses Victorine Bernard, M. Hersélie Catellier, M. Emilie Labrecque, M. Louise Lamothe, M. Zéphirine Pandelette dite Plaisance, and Martha Murphy (E).

2nd Class:—Misses Emilie Blanchet, M. Celina Chamberland, M^e Ursule Couture, M. Virginie Gagné dite Belleavance, M. Adeline-Elizabeth Giroux, M. Joséphine-Arthémise Lemieux, Aurélie Morrin, Julie-Hermine Pandelette dite Plaisance, M. Claire-Magdeleine Pelletier, M. Heloïse Rhéaume, M. Josephte Richard, M. Emilie Samson, M. Laure Sévigny, and M. Luce Turgeon.

N. Lacasse,
Secretary.

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BEAUCE.

Session of August 2nd, 1870.

Elementary School Diploma, (F) *1st Class*:—Miss Apolline Veilleux.

2nd Class:—Misses Catherine Lemieux, Marie-Eléonore Lebreux, Lucie Lessard, Célina Roy, Clotilde Cloutier, Rachel Gagner, Julie-Virginie Lessard, and Marie-Sara Bilodeau.

J. T. P. Proulx,
Secretary.

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CHARLEVOIX.

Session of August 2nd, 1870.

Elementary School Diploma, (F) *1st Class*:—Misses Philomène Boulianne, Marie-Louise Claveau, Malvina Gaudreault, and Marie-Ombéline Villeneuve.

2nd Class:—Miss Louise Tremblay.

Chs. Boivin,
Secretary.

—

SHERBROOKE.

Session of August 2nd, 1870.

Model School Diploma, (E) *2nd Class*:—Miss Sarah Lacy.

Elementary School Diploma, (E) *1st Class*: — Miss Elizabeth J. Barnard.

S. A. Hurd,
Secretary.

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RICHMOND.

Session of August 2nd, 1870.

Elementary School Diploma, (E) *1st Class*:—Miss Mary Ann Kennedy.

2nd Class (F):—Misses Mary B. Cowan, Marie Letourneau, and Alphonsine Pilon.

F. A. Brien,
Secretary.

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WATERLOO AND SWEETSBURGH (PROTESTANT).

Session of August 2nd, 1870.

Elementary School Diploma, (E) *1st Class*:—Misses Helen K. Brown Emily C. Savage, Julia T. Whitten, Messrs. Benjamin H. Booth, Charles Flanders, and Alfred Jones.

Wm. Gibson,
Secretary.

KAMOURASKA.

Session of August 2nd, 1870.

ELEMENTARY SCHOOL DIPLOMA, (F) *1st Class*:—Miss Adèle M. Hudon.

2nd Class:—Misses Antoinette Côté, Marie-Octavie Dionne, and Hélène M. Hudon.

P. DUMAIS,
Secretary.

WATERLOO AND SWEETSBURGH (CATHOLIC).

Session of August 2nd, 1870.

ELEMENTARY SCHOOL DIPLOMA, (F) *1st Class*:—Miss Marie Desmarais.

2nd Class:—Misses Rose-Délima Senécal, Rose-Délima Jauron, Marie C. David, Onésime Collette, and Clotilde Bellefleur.

J. F. LÉONARD,
Secretary.

AYLMER.

Session of August 2nd, 1870.

ELEMENTARY SCHOOL DIPLOMA, (E) *1st Class*:—Misses Catherine Gunn, Margaret Lochnen, Sophronie Lebel, Amelia E. McCrea, Catherine Horo, and Mr. Thomas Thorpe.

2nd Class:—Misses J. Olive Beaudry, (F) and Bridget E. Smith (E).

J. R. WOODS,
Secretary.

BONAVENTURE.

ELEMENTARY SCHOOL DIPLOMA, (E) *1st Class*:—Miss Louise Cyr.

J. A. LEBEL,
Secretary.

MONTREAL (PROTESTANT).

Session of August 2nd, 1870.

ACADEMY DIPLOMA, (E) *1st Class*:—Mr. Wm. John Crothers.

MODEL SCHOOL DIPLOMA, *1st Class*:—Miss Margaret J. Crothers, and Mr. Louis Norman Tucker (E. and F).

ELEMENTARY SCHOOL DIPLOMA, *1st Class*:—Misses Elizabeth Carroll, Mary Haney, Jane Henry, Annie McNaughton, Annie E. Rowe, and Elizabeth Wilson.

2nd Class:—Misses Mary Ann Adams, Annie M. Sayer, Mary Ann Smith, and Sarah Welch.

T. A. GIBSON,
Secretary.

MONTREAL (CATHOLIC).

Session of August 2nd, 3rd, and 4th, 1870.

MODEL SCHOOL DIPLOMA, (F) *1st Class*:—Miss Eléonore Tétreault.

2nd Class:—Miss Cécile Dupuis, Messrs. Pierre De Narbonne and Narcisse Longtin.

ELEMENTARY SCHOOL DIPLOMA, (F.) *1st Class*:—Misses Elmire Aubry, Ellen Barker (F. & E.), Octavie Beaulieu, Mélina Bélair, Alphonsine Benoit, Caroline Lumina Bibeau, Adèle Bisson, Aglaé Bourdelais, Vitalline Chabot, Angeline Charbonneau, Hermine Charretier, Octavie Charpentier, Angelina Daviau, Estelle David, Adèle Dewitt, Zéphirine Dufault, Marie Gaudet, Virginie Guérin, Ida Labelle, Georgiana Laferrière, Georgina Lalande, Carmélite Lassalle, Annie Leahy (E), Marcelline Leroux, Emma Lefebvre, Malvina Lebœuf, Anastasie Létourneau, Ellen McQuinn (E), Lucie Nadeau, Marguerite Péladeau, Delphine Poirier, Hélène Robert, Thècle Séné, Henriette Stébenne, Carmélie Trottier, and Justine Vincent.

2nd Class:—Misses Joséphine Barthe dit Belleville, Marguerite Beauchamp, Philomène Bélair, Alphonsine Brosseau, Aglaé Cardin, Sophie Couture, Parmélie Côté, Marie Demers, Salomé Déry, Perpétue Dorais, Victorine Fortier, Delphine Fournier, Eliza Garand, Elizabeth Grégoire, Virginie Hurteau, Elodie Lamoureux, A. Marie Laporte, Scholastique Leblanc, Rose Anne Lorange, Mary McGuire (E. & F.); Elizabeth McGill and Anna Moore (E); Georgiana Marquette, Emérentienne Maxwell, Célina Noyer, Marie Paquet, Mathilde Pigeon, Uthalride Poirier, Alexina Renaud, Alphonsine Ricard, Célina Robert, Célina Tétu, Exilda Vincelet, Elidia Wilson, and Valérie Yon.

F. X. VALADE,
Secretary.

THE JOURNAL OF EDUCATION.

QUEBEC, (PROVINCE OF QUEBEC,) SEPTEMBER 1870.

The Metrical System.

Our readers will see in this number of the *Journal* an article republished from the *Montreal Daily News* and containing a report of the Select Committee of the Senate on Weights and Measures. Teachers especially should keep themselves well informed on the nature and advantages of the Metrical System, and we have on former occasions called their attention to it. They will find the historical account of it, given in the Report, very interesting and useful. The system should be taught in all Schools as a necessary part of instruction in Arithmetic, and its introduction into Canadian educational institutions, not merely with respect to Money, but also Weights and Measures generally, would of course hasten and facilitate the establishment of uniformity throughout the Dominion for commercial and other business purposes. Our teachers should also take care that the text books on Arithmetic used in their Schools contain the Metrical Tables and that their questions or exercises, prescribed to the Scholars, are not confined, as is commonly the case, to such as require reference only to the ordinary tables of Weights and Measures as furnished in the School books. We need not wonder at our business men, farmers and others continuing to be indifferent to the use and value of the Metrical System when they have never had their attention directed to it at School.

History.

We commend to the notice of teachers an extract from the *Ohio Educational Monthly* on the teaching of History to the young. It furnishes some very useful hints and suggestions relative to the modes of dealing practically with that branch of school instruction.

We have also, in this number recommenced the giving of continuous articles which our readers may recollect used formerly to appear in the columns of the *Journal of Education*. The courses of modern History most advantageous for our youth to pursue are undoubtedly those which relate to their own country, England, France, and the United States. Our selections therefore appertain to these, beginning with Canada and England. Teachers will find short and interesting reading, given in simple and otherwise appropriate language, best adapted for the purposes we have in view—to foster a love of a branch of study at once delightful, useful and necessary in the proper education of youth. We shall not confine our selections to any particular authors, but while preserving continuity, have recourse to such as appear most suitable to our ends.

The conclusion of Dr. Baker Edward's article on the Modern Chemical Notation will appear in our next number.

Measures, Weights, and Coins.

(*Daily-News.*)

We have no hesitation in assigning to the Hon. Thomas Ryan the merit of having cleared the ground for a reform, in the system of measures, weights and coins of this Dominion. We are indebted to him for the progress we have made towards a settlement of the copyright question but the larger labor on which he has entered will, when consummated, entitle him to the thanks of every class of society. Few save those who are practical farmers, can appreciate the loss, annoyance and inconvenience of the want of any recognized standard of weight. The consequences are interminable squabbles; sales are made by the bushel, but the puzzle is to know what a bushel is. The Winchester has been abandoned in England for the imperial bushel. The Minot is no longer known in France, and the only remedy therefore has been to refer to weight. Wheat for example is sold at 62 or 64 lbs per bushel, so while the process of measuring it is retained the value of the measure is rejected for the weight. There is an instinctive repugnance to relinquish time-honored customs. Agriculturists are essentially conservative, yet the evils of the existing mode of measuring grain are so universally confused, that the reforms suggested by Senator Ryan will be gladly accepted. In 1854 we kept our books according to what was called the Halifax currency of pounds, shillings and pence, but our trading relations with the United States led the Parliament to see the necessity of introducing the decimal system which that country had borrowed from France. We have since grown enamoured with the simpler arithmetic of dollars and cents; yet it is precisely the same principle which Senator Ryan wishes to apply to weights and measures. The science of metrology has not enjoyed the study it merits. Our main excuse is that we paused to see the policy of British statesmen, and learn from them whether the metric system could be introduced amongst a people with ancient usages. In France the experiment was easy under a Government virtually despotic, but in each quarter of Great Britain distinct and differing modes of measuring the same article prevail. In Ireland wheat and oats though sold by the barrel vary in weight. The Scotch boll, the English quarter, the Imperial bushel, are all in use. We had not reached uniformity under the late union, and Confederation discloses the contradictions and confusion when the same term is used in different Provinces: as for instance the bushel of barley is assumed to weigh 48 lbs. in Ontario and Quebec, 52 or 48 in Nova Scotia, and 50 in New Brunswick. It is obvious that under such complications trading operations are embarrassed and litigation invited. The New Brunswick merchant if he ordered a cargo of barley would think himself entitled to 50 lbs. per bushel, while the Canada shipper would keep within the law if he delivered on board ship 48 lbs. to the bushel. Whatever enactment be passed care will be observed in its wording, so as not to clash with pre-existing contracts. The *rente viager* under which declining old age secures an income describes the *minot* and *arpent*, an equivalent must therefore be provided. The report of the select committee of the Senate on the subject of establishing a uniform international system of measures, weights and coins, of which Senator Ryan was chairman, is clear and satisfactory. He assigns the date of the metric system in Europe to the time of Louis the 14th; but two hundred years before Christianity the Chinese taught the Indians, Arabs and Japanese values by group signs, for 10, 100 and 1,000 with multiplier added to the left, and the Moguls introduced into Russia the Asiatic *Suanpan* reckoning machine, which has successive rows of strings to represent thousands, hundreds, tens, units. The French long since rejected Fahrenheit's clumsy mode of determining temperatures to which we adhere. In Fahrenheit's days no one conceived the possibility of a cold exceeding 32 degrees below the freezing point of water, and he assigned 212 as the temperature of boiling water. The centigrade graduation has many advantages over Farenheit's. (1) Its zero is at the freezing point of water; (2) its 100 degrees is the boiling point of water, degrees of cold are degrees below zero, and are preceded by the *minus* sign, thus—3 deg. may be read 3 degrees of cold or 3 degress below zero. There is one very admirable suggestion in the report. Senator Ryan calls the attention of the Government to the importance of causing the metrical system to be taught in all schools over which they exercise control, and obliging candidates for the civil service to possess a knowledge of the subject. Meanwhile the duty of the press is to educate the public mind and render the reform popular by pointing out its manifold advantages. As the first step in that direction we reproduce the report of the Senate in full. It will endure criticism and the more it is studied and understood by all classes, for it appeals to all, the more will it grow in public esteem. We are sure our readers will not grudge the space we devote to this interesting document. We but ask for it a careful reading.

Report of the Select Committee of the Senate on the Subject of Establishing an Uniform, International, Decimal, System of Measures, Weights, and Coins, and to Report how far such a system can be Advantageously Applied to the Measures, Weights, and Coins of this Dominion.

The Senate Committee Room.

Friday, 29th April, 1870.

The Select Committee appointed to enquire what steps have been taken, and what progress has been made in the United Kingdom towards establishing a uniform international decimal system of measures, weights, and coins, and to report how far such a system may be advantageously applied to the measures, weights and coins of this Dominion, now beg leave, in obedience to the order of reference of the twenty-first day of March last, to report as follows:—

The subject of weights and measures, first occupied the attention of your Committee, and they find that two systems are at present legalized and prevail in the United Kingdom, viz: the Imperial which is non-decimal and the Metric which is decimal.

The origin of the metric system in Europe dates as far back as the reign of Louis XIV, when the inconvenience and confusion arising from the variety of weights and measures in France were so strongly felt that a Royal Commission was appointed to investigate the question, and report on some suitable standard,. In 1790, M. Talleyrand presented a report on the uniformity of weights and measures, and it was decided that the cooperation of England should be invited in establishing an international system. Political complications, however, arose which at the time prevented the realization of this generous proposal; but the fundamental principle of the metric system, as then established, is that it should be international. After a lapse of nine years, a standard metre and standard kilogram were approved by the Corps Legislatif, and have ever since been preserved in the archives of the state at Paris. It was not, however, until so late as the year 1837 that the metric system was conclusively adopted in France. In that year the Legislative Chambers, moved by numerous petitions, enacted that on and after the 1st January, 1840, all weights and measures of any other standard or denomination than those of the metric system should be illegal. From this period upwards of ten years had elapsed, when consequent on the establishment of universal exhibitions,—inaugurated by that of London in 1851, which was followed by that of Paris in 1855—the attention of scientific and philanthropic as well as practical men of business was directed to this subject, and the jurymen and commissioners of the latter exhibition drew up a declaration, the spirit of which is well exemplified in the following concluding recommendation: "They consequently deem "it their duty earnestly to recommend to the consideration of their "respective Governments, and of enlightened individuals, friends of "civilization, and advocates for peace and harmony throughout the "world, the adoption of an uniform system of weights and measures, "computed decimally both in regard to its multiples and divisions, "and also in regard to the elements of all the different units."

Action was also taken by the statistical congress assembled in Brussels and in Paris, in 1853 and 1855, in favor of international uniformity, and subsequently, in September, 1855, an international association was formed, whose objects are expressed in the following extract from their proceedings:—

"The undersigned have determined to form an association, com- "posed of members chosen from the different civilized nations, who "shall engage to devote themselves each in his own country, by "means of committees corresponding with one another, to the establishment, in all civilized countries, of an uniform decimal system of "weights and measures, and as far as possible, of monies."

Amongst the branches of this association formed in different countries, the most active from the commencement has been the British. After mature deliberation, this association decided that the metre, with its decimal system, is the best unit of length, and has since strenuously advocated its introduction, and mainly contributed to place it in the position which it now holds in the United Kingdom, where nearly 60 per cent of the total export and import trade of the country is carried on with people using the metric system.

In the year 1835, the Imperial system of weights and measures was established by law in England. Since then no other system was legalized until the 29th July, 1864; when, by Act of Parliament, 28 Vict. c. 117, the use of the metric system was made permissive; and it is now, conjointly with the Imperial system, in use throughout the United Kingdom.

The preamble of this Act (which Act being very short, and, at the same time, containing valuable information relative to the metric system, is given at length in the appendix to this Report) sets forth that for the promotion and extension of the internal as well as the foreign trade of the United Kingdom, and for the advancement of science, it is expedient to legalize the use of the metric system of weights and measures.

Since the passing of this Act, there has not been any further legislation on this subject in the United Kingdom, but a Royal Commission has borne testimony to the progress of public opinion in favour of the metric system of weights and measures, and to its increasing use in scientific researches, and in the practice of accurate chemistry and engineering construction. The Commissioners, with the Astronomer Royal as Chairman, also stated their opinion, in a Report bearing date the 3rd of April, 1869, that the law should provide and that facilities should be afforded by the Government, for the introduction and use of the metric weights and measures in the United Kingdom, and that for this subject, metric standards should be legalized, and verified copies of them should be provided for general reference.

There has been a subsequent Report from the same Commission, dated 1st February, 1870, but this has reference solely to Troy weight, still partially in use, but the abolition of which is strongly recommended.

In their Report of 3rd April, 1869, the Royal Commissioners base their conclusions in favor of the metric system upon several considerations, one of which is the general adoption of this system " in many countries, both in Europe and other parts of the world, and more recently in the North German Confederation and in the United States of America." In support of this important statement, your committee deem it relevant to state that the metric system has already been adopted, and is in use either wholly or in part, in countries whose united population amounts to upwards of 400,000,000, as will be seen by the following tables.

Conntries in which the system has been wholly adopted :

	Population.
France with Algiers	40,500,000
Belgium	5,000,000
Netherlands and Colonies	23,000,000
Italy	24,0(0,000
Papal States	700,000
Spain and Colonies	21,000.000
Portugal and Colonies	8,000,000
Greece	1,200,000
Mexico	8,000,000
Chili	1,600,000
Brazil	9,000,000
New Grenada	2,000,000
Other South American Republics	3,000,000
	146,000,000

Countries in which the metric system has been partly adopted :

	Population.
Switzerland	2,500,000
Hanse Towns	500,000
Denmark	3,000,000
Austria	37,000,000
British India	140,000,000
	183,000,000

Countries where it is permissive :

United Kingdom	29,000,0000
United States of America	31,000,000
Prussia and North Germany	30,000,000
	90,000,000

On June 13th, 1868, the North German Parliament passed an Act adopting the metric system, and declaring its use permissive from 1st January, 1870, but compulsory on and after 1st January, 1872.

Between many of the above named countries and Canada, a large and growing business already exists and it seems desirable that the system upon which their computations of the bulk and weight of merchandize are founded, should be understood and put in practice in this Dominion.

Incidentally connected with the subject referred to your Committee, is the want of uniformity existing in the weights and measures of the four provinces which compose this Federation; and it may not be irrelevant to point out some of the omissions and discrepancies which characterize the statutes of Upper Canada, Lower Canada, New-Brunswick, and Nova Scotia, by which our weights and measures are still regulated.

And first it may be noticed that no common standards of weights and measures are established, nor are any means prescribed for ascertaining whether or not the old Provincial standards agree with, or differ from, each other, or should in future be, committed.

Again, certain old English measures of capacity, both dry and liquid, which have long since been abolished in the United Kingdom, are still in use and legal measures in parts of the Dominion. Of these the following instances may be cited :—

1st, The old English wine gallon, six of which are not quite equal to five of the Imperial gallon now in use in England.

2nd, The old English Winchester bushel, which is less, in the proportion of 32 to 33, than the Imperial bushel in England.

The following tabular statement exhibits certain discrepancies in stating the legal weight of a bushel of our staple grains and seeds, as well as of other articles of produce, which the laws of the various Provinces sanctions :—

	Ontario and Quebec.	Nova Scotia.	New Brunswick.
	lbs.	lbs.	lbs.
Wheat	60	60	60
Indian Corn	56	58	60
Rye	56	56	56
Pease	60	......	56
Barley	48	52 or 48	50
Oats	34	34	36
Beans	60	....	56
Clover Seed	60	....	56
Timothy Seed	48	....	40
Buckwheat	48	....	50
Potatoes and Turnips }	60	60	56
Carrots, Parsnips, Beets and Onions }		40	56
Flax Seed	50	....	56
Hemp Seed	44	....	56
Blue Grass Seed	14	....	56
Castor Beans	40	....	....
Salt	56	....	....
Dried Apples	22	....	....
Dried Peaches	33	....	....
Malt	36	39	....

In Quebec, it is provided that coals shall be sold by the chaldron or bushel, and that the chaldron shall contain six Imperial Winchester bushels, a measure whith, it is believed, does not exist.

In Nova Scotia, the law defines the weight of a ton of coals as 2,240 lbs. avoirdupois.

In New Brunswick, coals are, by law, sold per ton weight, and the ton is fixed at 2,000 lbs. avoirpupoids.

In Ontario, the ton weight, without any reference to coals, is fixed at 2,000 lbs. avoirdupois.

In Lower Canada, now Quebec, the old measures of the " *arpent*," the " *minot*," and the Paris foot, though obselete in France, are still in use; and as the *arpent* is smaller than the English acre, and the *minot* somewhat larger than the bushel, it is clear that misconceptions may readily arise as to the comparative value and productiveness of land in Lower Canada estimated on this basis, and that even statistical returns, without great care on the part of those who furnish, as well as those who collect them, may be stated erroneously and to the disadvantage of that Province as compared with others where the English statute acre and the bushel are alone in use.

In view of all these circumstances, your Committee are of opinion that no time should be lost in establishing by law an uniform system of weights and measures throughout the Dominion. The duty of initiating legislation on a subject of such general importance necessarily devolves upon the Government; and your Committee are of opinion that another Session should not be allowed to pass without a comprehensive measure being submitted to Parliament.

With regard to the metric system, your Committee consider that it is excellent in principle, simple in its construction, and capable of being acquired with great facility, and as such they strongly recommend its introduction in Canada. As, however, so large a proportion of the trade of this country is carried on with Grat Britain, your Committee suggest that her example may be safely followed, and that the metric system may, as in England, be made at first permissive and be adopted, as there, conjointly with her system of imperial weights and measures. This course would secure an uniform system of weights and measures for the various Provinces of this Domion, and at the same time in conformity with that of the mother country, an object much to be desired.

In contemplation of the early adoption of the metric system, and with a view that the youth of the country be made acquainted with it, your Committee would call the attention of the House to the propriety of suggesting to the Government the importance of causing this system to be taught in all schools over which they have control directly or indirectly. It is simple, easily learned, and not readily forgotten; and young men instructed in it will thus acquire additional facility in understanding the trade with countries where this system prevails exclusively. If this suggestion meet the approval of the Government a knowledge of the metric system might also with advantage be required on the part of candidates for the Civil Service.

The attention of your Committee was next directed to the subject of an uniform international system of coins.

In 1867 the British Government was invited by the French Government to depute Commissionners to attend a Conference at Paris of representatives of various States, for the purpose of deliberating upon the best means of securing a common basis for the adoption of a general international coinage.

The Lords of the Treasury accordingly instructed the Master of the Mint and an officer of their Department to attend the Conference.

These delegates reported that the Conference had agreed to recommend--

1st. The adoption of a single gold standard.

2nd. The adoption of $\frac{9}{10}$ as the proportion of fine gold in the coins.

3rd. That all gold coins thereafter struck in any of the countries, parties to the proposed convention, should be either of the value of 5 francs or multiples of that sum.

4th. That a gold coin of the value of 25 francs should be struck by such countries as prefer it, and be admitted as an international coin.

A Royal Commission was subsequently issued, appointing Commissioners to examine and report upon the recommendations of this international Monetary Conference.

The Commissioners reported favorably as to the two first of those recommendations, but not so favorably as to the two last.

In the course of their Report they say: "We entertain no doubt that "an uniform system of coins, bringing into harmony the various "standards of value and moneys of account, alike in their higher de- "nominations and their lower sub-divisions, as well as an uniform sys- "tem of weights and measures, would be productive of great general advantage." At the same time, they state grounds on which, in their opinion, with a view to the general interest of the commerce of the world, the English sovereign and pound might form a convenient basis for an international currency. But their principal reason for not recommending that the United Kingdom should merely adopt a gold coin of the value of 25 francs, to be substituted for the sovereign, was that such a measure would only be a partial one, and that by any change short of a complete assimilation of the currency of moneys of account as well as of coins, all the evils of a change in the value of the pound would be incurred, while the advantages by which it is anticipated that those evils would be compensated would not be attained.

Since the 25th July, 1868, when that Report was dated, some progress has been made by the Governments of England and France towards attaining the much desired object of an international coinage by establishing complete equality of value between the sovereign and the 25 franc gold piece, which it is proposed to coin in France.

The following extracts from a spech of the present Chancellor of the Exchequer, delivered in the British Houses of Commons on the 6th August, 1869, will best explain how the question then stood. After alluding to the prospect of France giving up her silver standard and adopting a single gold standard, Mr. Lowe said,—

"The French are proposing to coin a 25-franc gold piece--five "francs more than the Napoleon. That would be less in value than the "sovereign by 22 centimes, or about 2d. If we were about to impose a "seigniorage of about 1 per cent., or .993 of a grain, and take gold to "that amount from the coin, our sovereign would be identical with the "25-franc piece.—It would still remain as a current coin in this country "of exactly the same value as now, and it would have the additional "advantage that it would be identical in value with the 25-franc piece; "but in order that that might be done, France would have to make a "sacrifice on her part. I forget the mintage she charges--I believe it "is between a fifth and fourth per cent. If she could be prevailed upon "to make it one per cent, we should have solved the problem, as far as "England and France are concerned, of an international coinage. The "operation would be performed by modifications of the same principle "—England would as now take payment in money.—France would "deduct from her coin, and thus equality would be obtained. It is "singular to remark what a number of coins in the world approach "one another in value; the Spanish doubloon, the Prussian Frede- "rick, the half-eagle of America, approach exceedingly near in value "to each other, and I think it very possible, if France would meet us "in this way--should Parliament be induced to look at the matter from "the point of view I have put it—we might come to some arrangement "by which we should get the blessing of one coinage throughout "Europe, a great step in civilization. These are the remarks I had to "make to the House. They are not given with any great confidence in "my own opinion. All I am anxious to do before we separate is to give "honorable gentlemen and the country at large a subject for considera- "tion. It appears to me that the subject is not so difficult as might be "supposed; and that by a single measure we may secure to ourselves "the great benefit of saving all the expenses incurred on our own gold "coinage, without imposing those expenses on any one else, and at the "same time of striking a coin which would have the advantage of an "international circulation."

Your Committee have reason to believe that recently further progress has been made in negotiating with France, but no legislation had taken place upon the subject in the Parliament of the United Kingdom up to the date of the latest information from England in the possession of your Committee.

Your Committee have had the satisfaction of ascertaining from the Honorable the Minister of Finance that the Canadian silver coins now in course of preparation will be of a decimal character, and of such denominations and intrinsic values as always to serve for tokens of subdivisions of the proposed twenty-five franc piece, if established as an international standard, as well as of the sovereign and of the five dollar gold piece when assimilated to the twenty-five franc piece.

In Nova Scotia, as is well known, the values placed by law on the British sovereign and the British shilling are $5 and 25 cents respectively; so that the currency of Nova Scotia is at present suited for the decimal system, and the coins in circulation there bear a decimal relation to each other.

By the Act passed on the 22nd May, 1868 (31 Vict., cap. 45), Canada has placed herself in a position to adapt her currency to an international decimal system of coinage, as soon as the great commercial nations of Europe and America have agreed to establish such a system, an event which your Committee hope may not be far distant, as they fully concur in the opinion of the Royal Commissionners already cited that such a system would be productive of great general advantage.

All which is respectfully submitted.

T. RYAN.
Chairman.

University Intelligence.

McGILL COLLEGE, MONTREAL.

The competitive examinations for the scholarships and exhibitions recently established in the Faculty of Arts, were held in McGill College, on Sept. 14, 15, 16 and 17. The following list contains the names of the successful candidates, with their places of education and residences in the case of the first two years, and residences only for the others years, the annual value of the schorlarship or exhibition and the name of the donor or founder. It may be noticed that while exhibitions are tenable for only one year, scholarships are tenable for *two*.

FOURTH YEAR EXHIBITIONS.

Classics.—John D. Cline, Cornwall, Ont., $125, tenable for one year. Donor, *W. C. MacDonald*, Esq.

Mathematical Physics.- James Cameron, Lancaster, Ont., $125, tenable for one year. Donor, *W. C. MacDonald*, Esq.

Natural Science.—Wm. J. Dey, Kenyon, Ont., $125, tenable for one year. Donor, *W. C. MacDonald*, Esq.

In consequence of the excellent answering of two other candidates for this exhibition, F. W. Kelley, Stewiake, N. S., and J. S. Tupper, Halifax, N. S., the Faculty will recommend to the Corporation that another *MacDonald* Exhibition be divided between them.

Mental and Moral Philosophy.—Duncan H. McLennan, Lancaster, Ont., $100, tenable for one year. Donor, *T. M. Taylor*, Esq.

SCHOLARSHIPS—THIRD YEAR.

Science.—R. Ellis, Cornwallis, N. S., $125, tenable for two years. Donor, *W. C. MacDonald*, Esq.

W. H. Naylor, Noyau, P. Q., $100 to $120, tenable for two years. Donors, *The Governors*.

Classics and Modern Languages.—D. W. R. Hodge, Eaton, P. Q., $125, tenable for two years. Donor, *W. C. MacDonald*, Esq.

John Maxwell, Lancaster, Ont., $120, tenable for two years. Founder, *Charles Alexander*, Esq.

SECOND YEAR EXHIBITIONS.

S. J. Tunstall, Montreal, High School, $125, tenable for one year. Donor, *T. M. Thompson*, Esq.

R. L. MacDonnell, Montreal, Lennoxville School, $125, tenable for one year. Donor, *W. C. MacDonald*, Esq.

Arthur F. Ritchie, Montreal, High School, $125, tenable for one year. Donor, *W. C. MacDonald*, Esq.

FIRST YEAR EXHIBITIONS.

W. B. Dawson, Montreal, High School, $125, tenable for one year. Donor, *W. C. MacDonald*, Esq.

Archibald D. Taylor, Montreal, High School, $125, tenable for one year. Donor, *W. C. MacDonald*, Esq.

Charles Harvey, Newfoundland, Dalhousie College, Halifax, N. S., $125, tenable for one year. Donor, *T. M. Thompson*, Esq.

John S. McLennan, Montreal, High School, $100, tenable for one year. Donor, *Mrs. Jane Redpath.*

John Allan, Leeds, P. Q., St. Francis College, $100, tenable for one year. Donor, *Principal Dawson.*

The next examination for Scholarships and Exhibitions wtll be held in September, 1871. Full particulars may be had from the Secretary of the College.

OFFICIAL DOCUMENTS.

SUPPLEMENTARY LIST OF GRANT IN AID OF POOR SCHOOL MUNICIPALITIES FOR THE YEAR 1869.

Counties.	Municipalities.	Reasons for the Grant as well as the Amount.	Amount of Ordinary Grant.	Amount of Assessment Raised.	Amount Asked.	Amount Granted.
Argenteuil	Grenville, (No. 2.)	There have been already granted $16,—this sum is for a new District	90 68	64 00	30 00	20 00
Bellechasse	Buckland	Poor, maintains three schools	90 44	112 00	30 00	30 00
Charlevoix	St. Urbain	do do do do	86 52	208 00	40 00	30 00
"	St. Irénée	do do do do	112 82	240 00	40 00	30 00
"	Petite Rivière	do do do do	82 30	92 00	30 00	30 00
"	Ile aux Coudres	do do four schools	70 14	152 00	40 00	30 00
"	St. Placide	do do two schools	50 70	100 00	40 00	30 00
"	St. Fidèle	Maintains four schools and has built a school-house	94 52	303 00	40 00	30 00
"	Ste. Agnès	Repaired a house, four schools	149 68	268 00	40 00	30 00
"	De Sales	Few in number and poor, one school	45 00	52 00	40 00	20 00
"	Settrington	do do do three schools	61 04	164 00	40 00	30 00
Bonaventure	Miguasha	Not numerous and poor, one school	24 21	84 00	30 00	20 00
Huntingdon	Huntingdon (Diss)	Poor and scattered, two schools	25 70	46 00	30 00	30 00
Nicolet	Ste. Gertrude		164 04	160 00	30 00	20 00
Mégantic	St. Calixte	Two poor Districts, maintains ten schools	288 74	778 26	40 00	30 00
Ottawa	Aylmer	A considerable sum is lost through operation of last School Act and the greater part of the pop is poor.	157 94	860 00	400 00	150 00
Portneuf	Portneuf	A House capable of containing the Model and Girls School is wanted	210 68	426 00	100 00	80 00
Témiscouata	Notre-Dame du Lac	New and very poor	93 83	110 00	30 00	80 00
Richmond	Shipton (Diss.)	Population sparse				20 00

Supplementary List of the Apportionment of the Superior Education Fund, for 1869.

Counties.	Municipalities.	Sum Granted.	Addition'l Grant	Total.
Kamouraska	Ste. Anne	73 00	73 00	146 00
Témiscouata	Rivière du Loup (en bas)	73 00	50 00	123 00
Nicolet	Bécancour	56 00	69 00	125 00
Bonaventure	Carleton	103 00	50 00	153 00
Champlain	St. Maurice	56 00	17 00	73 00
Nicolet	Gentilly (Convent)		100 00	100 00
	Schools of Science applied to the Arts			1044 00
				1403 00

MISCELLANY.

Education.

—*Scientific Education of Women.*—Few have yet realized the enormous gain that will accrue to society from the scientific education of our women. If, as we are constantly being told, the "sphere of woman" is at home, what duty can be more clearly incumbent upon us than that of giving her the opportunity of acquiring a knowledge of the laws which ought to guide her in the rule of her house? Every woman on whom the management of a household devolves may profit by such knowledge. If the laws of health were better known, how much illness and sorrow might be averted! What insight would a knowledge of chemistry afford into the wholesomeness or unwholesomeness of different articles of food! What added zest would be given to a country walk with the children, or a month by the sea-side, if the mother were able to teach the little ones intelligently to observe and revere the laws of nature! Above all, what untold sufferings, what wasted lives, are the penalty we have paid for the prudish ignorance of the physiology of their bodily frame in which we have kept our daughters!

—*Voices.*—We make the following extract from an article in the London *Saturday Review*: Far before the eyes, or the mouth, or the habitual gesture, as a revelation of character, is the quality of the voice and the manner of using it. It is the first thing that strikes us in a new acquaintance, and it is one of the most unerring tests of breeding and education. There are voices, which have a certain truthful ring about them—a certain something, unforced and spontaneous, that no training can give. On the other hand there are voices which have the jar of falsehood in every tone, and that are as full of warning as the croak of the raven, or the hiss of the serpent. These are in general the naturally hard voices, which make themselves carressing, thinking by that to appear sympathetic; but the fundamental qualities strike through the overlay, and a person must be very dull, indeed, who cannot detect the pretence, in that slow, drawling, would-be affectionate voice, with its harsh undertone and sharp accent whenever it forgets itself. We all know the effect, irritating or soothing, which certain voices have over us; and we have all experienced that strange impulse of attraction or repulsion which come from the sound of the voice alone. And generally, if not absolutely always, the impulse is a true one, and any modification which increased knowledge may produce is never quite satisfactory. We all have our company voices, as we all have our company manners, and we get to know the company voices of our friends after a time, as we understand their best dresses. The person whose voice absolutely refuses to put itself into company tone, startles us as much as if he came to a State dinner in a shooting jacket. The company voice is only a little bit of finery, quite in its place if not carried into the home. The cultivation of the voice is an art, and ought to be as much a matter of education as a good carriage or a legible handwriting. We teach our children to sing, but we never teach them to speak, beyond correcting a glaring piece of mispronunciation or so, in consequence of which we have all sorts of odd voices among us—short, yelping voices, like dogs; purring voices, like cats; croakings and lispings, and chatterings, a very menagerie, in fact, to be heard in a room ten feet square, where a little rational cultivation would have reduced the whole of that vocal chaos to order and harmony, and made, what is now painful and distasteful, beautiful aud seductive."

Literature.

—*Dickens in Westminster Abbey.*—Charles Dickens lies, without one of his injunctions respecting his funeral having been violated, surrounded by poets and men of genius. Shakespeare's marble effigy looks upon his grave; at his feet are Dr. Johnson and David Garrick; his head is by Addison and Handel, while Oliver Goldsmith, Rowe, Southey, Campbell, Thomson, Sheridan, Macaulay and Thackeray, or their memorials, encircle him; and "Poets' corner," the most familiar spot in the whole Abbey, has thus received an illustrious addition to its peculiar glory. Separated from Dicken's grave by the statues of Shakespeare, Southey and Thomson, and close by the door to "Poets' corner," are the memorials of Ben Jonson, Dr. Samuel Butler, Milton, Spenser and Gray; while Chaucer, Dryden, Cowley, Mason, Shadwell and Prior, are hard by, and tell the by-stander, with their wealth of great names, how

"These poets near our princes sleep
And in one grave their mansion keep."

—The Paris Academy of Inscriptions and Belles-Lettres has bestowed Gaberi's first prize upon M. Simeon Luce, keeper of the records of the empire, for the first volume of his edition of the "Chronicles of Froissart." M. Simeon Luce who is not yet forty years of age, has already distinguished himself in the fields of literature. He entered the famous school of Chartres in 1856, and is now one of the directors of its library. The works by which he is best known are his "History of Jacquerie from unpublished documents," and his "Collection of the ancient poets of France," in which, for the first time, appeared the inedited poem of "Gaidon." He also discovered, among the MSS. of the Imperial Library, an unpublished chronicle of the fourteenth century, which was issued under the title of the "Chronicles of the First Four Valois," which at the time excited much interest among the learned societies of France.

—The French Academy has divided the Bordier prize between M. Marthe, Professor of Latin Eloquence at the Sorbonne, the author of the "Poem of Lucretius"; and M. Heinrich, Professor of Belles-Lettres at the University of Lyons, author of the "History of German Literature." Both of these works are generally admired, being in the highest degree interesting and instructive.

—Children of every growth will rejoice to know that, just as Sir Walter Scott illustrated the history of his country in "Tales of a Grandfather", so is M. Guizot illustrating that of France in a history "Racontée à mes Petits Enfants." The veteran author will stop at 1789.

— Strasbourg Library, which has been destroyed by fire, is said to have been the most valuable library in France, next to the Imperial Library in Paris. It contained 150,000 volumes, a great many documents of inestimable value relating to the Reformation, and all the *incunables* which belonged to the library of the Commandery of St. John of Jerusalem. Among its MSS. were the MS. of Herrade of Landspang, Abbess of St. Odile, entitled Hortus Deliciarum, dated the 12th century, and whose miniatures furnished the most valuable information to the history of art and costumes; a collection of prayers of the eighth and ninth century, on vellum, in gold and silver characters; a Missal with the arms of Louis XII.; the collection of the constitutions of Strasbourg, and the mediæval poem of the Siege of Troy in 60,000 lines, by Conrad of Wurzberg. All these treasures are now but ashes.

Science.

—*Existence of Zoospores in Lichens.*—Herr Famitzen, in collaboration with Herr Boranetsky, has recently discovered that lichens, as well as algæ and fungi, are provided with zoospores. These curious little vibratil bodies have been discovered already in the three genera, *Physcia*, *Cladonia*, and *Evernia*, which these botanists chose promiscuously; so that it is probable zoospores will be found in all lichens which contain chlorophyl. The same authors assert, on the anthority of ths *Scientific Review*, that they have demonstrated the identity of the seed gonidia of lichens with certain unicellular algæ (*Cystococcus Polycoccus*, and *Nostoc*) which would be only the young forms of *Collema*, *Peltigera*, &c.; an extremely interesting fact if corroborated by future observation.

—*Night Temperature.*—Dr. Stark reports that one of the most important elements bearing on vital statistics is night temperature. It is the night temperature far more than that of the day which has the most deleterious influence on human life. He recommends that, along with the statistics of mortality, both the absolute and the mean lowest or night temperatures should be published. Experience in Scotland has shown that an excessively cold night, when the temperature falls to 10° or to 5°, or below zero, the change is most fatal to the aged, to the very young, and to those weakened by diease. In some of the smaller parishes of Scotland a cold night has been known to kill all persons above eighty years of age; husband and wife, brother and sister, being found dead in their beds in the morning after such a night of cold.

—*Respiratory Surface in Human Lungs.*—According to Hopley's "Lectures on the Education of Man," the number of air-cells in the human lungs "amounts to no less than six hundred millions." According to Dr. Hales, the diameter of each of these may be reckoned at the 100th of an inch; while according to the more recent researches of Professor Weber, the diameters vary between the 70th and the 200th of an inch. Now, estimating the internal surface of a single cell as about equal to that of a hollow globule of equal internal diameter, then, by adopting the measurement of Hales, we find that 600 million such cells would possess collectively a surface of no less than 145 square yards; but by basing our calculations on the opinions of Weber—opinions, remember, which the scientific world receives as facts—we arrive at the still more astounding conclusion, that the human lungs possess upwards of 166 square yards of respiratory surface, every single point of which is in constant and immediate contact with the atmosphere inspired. It will be useful, then, to imprint on the memory, that whether we breathe pure or putrid air, the air inspired is ever in immediate contact with an extent of vital surface ample enough for the erection of two or three large houses.

Art.

—*Needles.*—Until the middle of the sixteenth century the English needlemakers were wholly dependent for their wire upon Spain and Germany. At about that period the needlemakers began to draw their own wire, which, in the rude state of the industry, sufficed for the antiquated square-eyed needle. This needle was much more easily constructed than the present pattern. It was the universal pattern until comparatively recent times, and was used by the hapless Queen of Scots in the tapestries she wrought for her prison walls. Now the "square-eye" is quite extinct. The "drilled-eye" needle was introduced by a Studley manufacturer at the close of the last century, but the process proved too expensive for practical use. Shortly afterwards, on the suggestion of a Birmingham factor, a press was constructed which in theory was to form the eyes of 100 needles at a time, but in reality it only pressed thirty-five. In 1826 drilled-eye needles were again introduced in connection with pressed needles, to which was shortly added the burnishing machine, by which the sharp points were removed from the eye, which would, if left, have cut the thread. We are informed by the authorities already quoted that in burnishing the eyes the needles are now threaded on steel wires of suitable size which have been made rough with a file and hardened. The ends of these wires are then fixed in a machine turned by steam power, and so arranged as to cause the needles to revolve rapidly with an oscillating motion round the wire. In some cases the wires also are made to revolve. The needle-pointing machine is an English invention, contrary to general supposition. Its fore-runner, which, though imperfect, approached so nearly to completeness as to alarm pointers, was some years ago purchased by them and broken to pieces on Redditch Church Green. The needle-pointing machine is yet only partially used in Birmingham. A grooved grind-stone, revolving at great speed, is employed to grind the end of each wire into the desired shape; to this grindstone the wires are applied from an inclined plane, on which a number are placed ready cut to the required length. By means of a disc surrounded with caoutchouc, revolving slowly in a direction transverse to the grindstone, a continuous supply of wires rapidly following one after another is supplied to the stone, and the same disc causes the wires to revolve while being pointed.—*The Engineer.*

—*Pins pointed by Electricity.*—A recent discovery has been made by M. Cadery, telegraph inspector on the Western Swiss railroad, and is now applied with success at Aix la Chapelle (Belgium), whence needles and pins are shipped to all parts of the world. On passing a metallic wire (brass, copper, iron or steel), connected with the negative pole of a Bunsen's battery, through the bottom of a glass tube, closed in such a way as to hold an acidulated liquid, and leading the other wire of the positive pole through the superior opening of the glass tube, closed in such a way as to allow the positive wire to plunge into the acidulated liquid, taking care to leave a small interval between the extremities of the wires; the electric current thus established through the acidulated fluid as a conductor, produces the following phenomena. Very soon the extremity of the positive wire takes a conical point of more or less sharpness, depending on the free distance existing between the two wires plunging into the acidulated liquid. During this phenomenon, which takes from 5 to 15 minutes, according to the acid used, its strength, the composition of the wire, its degree of thickness, and also the intensity of the electric current, very fine sections of the wire are seen to separate from the wire. Water, acidulated with sulphuric acid, appears to be more efficacious, especially for iron and steel wires. Nitric acid is used in preference for brass and copper wires. The same effect will take place if to the positive pole (superior) an indefinite number of wires are tied together and dipped in the acidulated water, instead of the single wire, care being taken always to keep this positive wire at a little distance from the negative wire. I have seen a hundred brass wires after having been submitted to this operation, present points as sharp as the best English pins, although the electric current was produced by a very small Bunsen's battery. It appears to me very desirable that this new method should receive proper encouragement, and everything should be tried to bring it into general use. The operation of making the points of needles and pins in their manufacture is a dangerous and costly one. Medical men in large manufacturing cities have long recognized the dangerous effects produced by the fine metallic dust resulting from it, on the health of the workmen. The remedies for this evil are very imperfect, little used, and very impraticable; inhaling apparatus communicating with the outside air has been tried, but every danger would be suppressed by the method above described.—*Scientific American.*

Contributions to Canadian Meteorology.

Compiled from the Records of the Isle Jesus and Montreal Observatories.

By CHARLES SMALLWOOD, M.D., LL.D., D.C.L., Professor of Meteorology in the University of McGill College, Montreal.

The following table has been drawn up for the purpose of showing the respective dates of the setting in and of the breaking up of our Canadian winters for the past twenty-one years, and for illustrating the climatology of Montreal and its vicinity.

1	2	3	4	5	6	7	8	9	10
YEARS.	First Snow of Autumn in comparatively Inappreciable Quantities.	First Snow of Autumn in Appreciable Quantities.	Depth in Inches.	First Frost of Autumn.	Date of First Descent of Thermometer to 32° F.	Last Snow of Spring.	Date of Last Descent of Thermometer to 32° F.	Winter fairly set in.	Date of the Ice leaving the St. Lawrence in Front of the City of Montreal.
1849	Nov. 27	Dec. 1	2.00	Oct. 15	Oct. 6	Apr. 13	Apr. 18	Dec. 10	Apr. 7
1850	,, 17	Nov. 18	2.14	,, 14	,, 14	,, 14	,, 20	,, 7	,, 9
1851	Oct. 25	,, 15	1.50	,, 2	,, 16	,, 8	,, 14	Nov. 21	,, 9
1852	,, 17	,, 11	1.20	Sept. 17	Sept. 29	,, 16	,, 24	Dec. 18	,, 19
1853	,, 24	Oct. 24	2.00	,, 12	,, 30	,, 14	May 1	,, 17	,, 24
1854	,, 15	Nov. 17	1.10	,, 11	,, 11	,, 30	,, 7	,, 4	,, 25
1855	,, 24	,, 17	2.74	Aug. 9	,, 29	,, 11	,, 10	,, 23	,, 28
1856	Nov. 1	,, 25	1.30	,, 26	Oct. 4	May 31	,, 6	Nov. 29	,, 24
1857	Oct. 20	,, 16	2.01	Sept. 7	Sept. 30	Apr. 27	,, 14	Dec. 21	,, 18
1858	Nov. 4	,, 13	3.25	Aug. 25	Oct. 23	,, 22	,, 14	,, 20	,, 9
1859	Oct. 20	Oct. 21	2.30	Oct. 7	,, 8	,, 23	Apr. 27	,, 10	,, 4
1860	Sept. 29	,, 15	1.10	Sept. 3	Sept. 29	May 20	May 20	,, 2	,, 10
1861	Oct. 23	Nov. 3	0.32	,, 5	Oct. 21	Apr. 17	,, 4	,, 21	,, 24
1862	Nov. 10	,, 26	1.84	Aug. 24	,, 10	May 7	Apr. 27	,, 19	,, 23
1863	,, 11	,, 26	1.94	Oct. 24	,, 27	,, 2	,, 21	,, 9	,, 25
1864	Oct. 8	,, 5	3.10	Sept. 26	,, 29	Apr. 18	,, 5	,, 12	,, 13
1865	,, 28	Oct. 29	0.66	Oct. 21	,, 23	,, 20	,, 19	,, 22	,, 10
1866	,, 4	Dec. 6	0.80	Sept. 16	Sept. 24	May 3	May 2	,, 16	,, 19
1867	Nov. 5	Oct. 14	1.60	,, 23	Nov. 3	,, 2	,, 4	,, 1	,, 22
1868	Oct. 17	,, 21	4.92	Oct. 4	Oct. 17	Apr. 23	,, 1	,, 7	,, 17
1809	Sept. 27	,, 22	6.47	Sept. 28	,, 20	May 3	Apr. 29	,, 4	,, 23

Meteorology.

—From the Records of the Montreal Observatory, lat. 45° 31 North Long. 4h. 45m. 11 sec. West of Greenwich, and 182 feet above mean sea level,—for July, 1870,—by CHAS. SMALLWOOD, M.D., LL.D., D.C.L.

DAYS.	Barometer corrected at 32°			Temperature of the Air.			Direction of Wind.			Miles in 24 hours.
	7 a.m.	2 p.m.	9 p.m	7 a.m.	2 p.m.	9 p.m	7 a.m.	2 p.m.	9 p.m.	
1	29.811	29.806	29.957	54.2	78.0	59.7	wbyN	wbyN	wbyN	89.74
2	30.021	30.107	30.000	58.2	77.9	69 0	wbyN	w	w	104 00
3	29.950	29 916	29.900	64.1	80 0	74.6	wbyN	wbyN	w	77 20
4	.947	.914	.875	65.8	87 2	72.3	w	s w	s w	80.00
5	.873	.897	.880	64.2	80.9	71.7	s	w	w	65 24
6	.961	.960	.960	67.8	86.4	75 8	w	w	w	97.10
7	.825	.626	.600	73 0	82 4	74.0	w	s w	s w	109.24
8	.601	.716	.800	66.0	71.0	66.8	w s w	w	w	121.04
9	.86	.873	.900	62.2	79 0	69.1	w	w	w	314.27
10	.900	.911	.950	68.2	83 2	75.3	w	w	w	289 42
11	30.000	.994	.947	68.2	89.2	77.0	w	w	w	297.12
12	29.775	.857	.721	68.6	81 7	72.0	w	s w	s w	114.10
13	.750	.749	.698	73.4	82 4	66.1	w	w	w	161.21
14	.705	.742	.761	68.2	78.8	68.0	w	w	w	97.27
15	.862	.911	.950	65.2	82.4	68.3	w	w	w	101.20
16	.961	.907	.849	62.0	81.7	72.1	w	s w	s w	97.24
17	.862	.826	.851	68.7	88 0	77.6	s w	w	w	90.00
18	.872	.861	.800	74.2	92.0	77.7	w	w	w	197.79
29	.962	30.050	30.000	70.0	90 2	75 8	w	N E	N E	184.12
20	.976	29.914	29.849	71.1	89.2	74 0	N E	s w	w	99.12
21	.824	.960	30 011	73.2	92.2	72.0	N E	wbyN	N	194.27
12	30.060	.967	29.926	68.7	90.3	77.2	w	w	w	101.12
23	29.997	.970	.946	70.4	87 4	79.6	w s w	w	w	274.44
24	.899	.801	.783	74.7	96 1	74 0	w	w	w	114.10
25	.961	.974	.992	72.3	84 1	73.2	w	w	w	101.24
26	.951	.902	.851	71.1	87.0	75 1	w	w	s w	89.94
27	30 026	.997	.946	61.2	82.0	69.1	N E	S E	N E	274.24
28	29.900	.811	.712	65.1	92 0	74.2	N E	w	w	101.12
29	.622	.820	.700	69.0	72.1	64.2	s w	w	w	97 74
30	.847	.912	30.050	67.0	74 2	68.2	N E	w	w	201.11
31	30.008	.988	29.936	68 0	87.7	70.1	w	w	w	212.00

Remarks.—Highest reading of the Barometer, was 30.000 inches on the 22nd day; lowest on the 7th, 29.600 inches; monthly range 0.466 inches; mean temperature for month 74° 62, which is 5 degrees higher than the *isotherm* for Montreal. The highest reading was on the 24th day, and was 96° 1. The mean temperature of that day (the warmest day) was 81° 6.

Rain fell on fourteen days, amounting to 3.352 inches, and was accompanied by thunder on five days.

—Meteorological Observations taken at Quebec, during the month of July, 1870; by Sergt. John Thurling, A. H. C., Quebec.

Barometer, highest reading on the 22nd..............	29.881 inches.
,, lowest ,, ,, 8th............	29.378
,, range of pressure........................	0.503
,, mean for month (reduced to 32°)...........	29.566
Thermometer, highest in shade on the 24th was........	95.0 degrees.
,, lowest ,, ,, 1st...........	46 3
,, range in month..........................	48.7
,, mean of all highest..........................	82.7
,, mean of all lowest..........................	59 6
,, mean daily range..........................	23.1
,, mean for month..........................	71.2
,, highest in sun's rays..........................	133 0
,, lowest on grass..........................	45.0
Hygrometer, mean of dry bulb..........................	73.7
,, ,, wet bulb..........................	64.4
,, ,, dew point..........................	52.6
,, elastic force of vapour..........................	.475
,, vapour in a cubic foot of air..............	5.2 grains.
,, ,, required to saturate do..............	3.6
,, mean degree of humidity (Sat. 100).......	57
,, average weight of a cubic foot of air......	512.6
Cloud, mean amount of, (0-10)..........................	5.8
Ozone, ,, ,, (0-10)..........................	3.3
Wind, mean direction of ,, North..................	4.50 days.
,, ,, ,, ,, East..................	4.75
,, ,, ,, ,, South..................	5.50
,, ,, ,, ,, West..................	15.75
,, ,, ,, ,, Calm..................	0.50
,, ,, force by estimation..................	2 5
,, ,, daily horizontal movement..............	125.4 miles.
Rain fell on..........................	14 days.
Amount collected..........................	6.59 inches.

—From the Records of the Montreal Observatory, Lat. 45°31 North; Long., 4h. 54m. 11 sec. West of Greenwich, and 182 feet above mean sea level,—for August, 1870,—by Chas. Smallwood, M.D., LL.D., D.C.L.

DAYS.	Barometer corrected at 32°			Temperature of the Air.			Direction of Wind.			Miles in 24 hours.
	7 a m.	2 p.m.	9 p.m.	7 a.m.	2 p.m.	9 p.m.	7 a.m.	2 p.m.	9 p.m.	
	29.861	29.897	29 860	70.0	87.1	74.1	W	N E	N E	214.10
2	.849	.822	.911	58.3	74.2	64.1	N E	N E	N	192.27
3	.901	.824	.300	57.6	77.2	69.1	N	S W	S W	97.70
4	.762	.730	.760	68.0	86.7	74.3	S W	S W	W S W	110.44
5	.674	.711	.750	65.0	80.0	67.9	S W	W	N	120.21
6	.901	.858	.850	66.0	73.1	72.6	N	E	S	110 00
7	·961	·994	30.001	69.7	86.4	74.2	S W	W	W	98.74
8	.950	.951	29.954	71.1	89.0	80.1	W S W	sby N	W bys	84.10
9	30.059	.997	.951	74.2	85.2	75.0	W	S W	W	109 29
10	.047	30.049	30 052	69 6	86 2	77.3	W	W	W	124.14
11	.100	.098	.101	71.1	89.4	78.0	W	W	W	117.10
12	29.996	29.999	29.950	72.1	75.4	73.7	W	N E	S W	89.40
13	30 114	.992	.924	65.0	68.2	67.7	W	W	W	114.20
14	29 921	.875	.900	62.0	78.0	66.0	W	W	N	111.00
15	.998	.974	.949	57.1	76.2	64.2	WbyN	W	W	104.27
16	.874	.791	.730	58.4	86.1	70.1	W	W S W	S W	94.10
17	.676	.654	.568	65.2	82.0	72.1	W	W	W	101.00
18	.781	.842	.901	68.0	83.4	70.0	W	W	W	304.10
19	.950	.917	.850	67.1	92.6	79 0	W	S W	W	191.16
20	.951	30 021	30.160	71.4	89.6	68.7	W	W	W	144.20
21	30.199	.200	.202	60.2	76.4	66.2	N E	N E	N E	101.00
22	.200	.181	.125	61.0	71.2	65.0	N E	N E	W	91.11
23	.101	.100	.002	61.9	74.2	68.0	W	W	W	84.17
24	.101	.002	29.984	67 4	85.0	72.6	W	S	S	81.74
25	29 899	29 700	.700	69 4	78.2	73.0	S	W	W	74.10
26	30.148	30.161	30.260	54.6	69.9	60.1	W	W	E	211.12
27	.346	.211	.164	54.7	71.6	64.0	W	W	W	89.10
28	.150	.051	.011	59.7	80.0	59.6	W	W	W	114.20
29	29.898	29.717	29 652	62.0	71.0	70.2	W	W	W	98.20
30	.801	.860	.926	63 0	76 3	67.0	W	W	W	214.12
31	.950	.967	987	61.1	72.0	64.1	W	W	W	301.17

The highest reading of the Barometer was on the 27th day, and indicated 30.346 inches. The lowest reading was on the 29th day, giving a range of 0.694 inches. The highest temperature was on the 19th day, and was 93° 1. The lowest was on the 26th day, and was 53°. The mean temperature of the month was 71° 43, which is 1° 73 higher than the *Isotherm* for Montreal. Rain fell on 8 days, amounting to 2.771 inches, and was accompanied by thunder storms on 3 days.

—Meteorological Observations taken at Quebec, during the month of August, 1870; by Sergt. John Thurling, A. H. Corps, Quebec.

Barometer, highest reading on the 21st	30.087 inches.
„ lowest „ 17th	29.445
„ range of pressure	0.642
„ mean for month reduced to 32°	29.652
Thermometer, highest reading on the 11th	89.7 degrees.
„ lowest „ 27th	42.5
„ range in month	47.2
„ mean of highest	77.6
„ mean of lowest	56.4
„ mean daily range	21.2
„ mean for month	67.0
„ highest reading in sun's rays	127 3
„ lowest temperature on grass	44.4
Hygrometer mean of dry bulb	69 2
„ „ wet bulb	61.4
„ „ dew point	55.4
„ elastic force of vapour	.439
„ vapour in a cubic foot of air	4.8 grains.
„ vapour required to saturate, do	3.0
„ „ humidity, (Sat. 100)	62
„ average weight of a cubic foot of air	517.9
Cloud, mean amount of (0-10)	5.7
Ozone „ „ (0-10)	3.3
Wind, mean direction of „ North	4.75 days.
„ „ „ „ East	2.75
„ „ „ „ South	5.00
„ „ „ „ West	14.00
„ „ „ „ Calm	4.50
„ „ force by estimation 0-12	1.5
„ „ daily horizontal movement	107.1 miles.
Rain fell on	14 days.
Amount collected	2.77 inches.

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