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JOURNAL OF EDUCATION.

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LITERATURE.

POETRY.

VERSES IN HONOR OF MARGARET BOURGEOYS.

[Homage offered to the Reverend Mother Superioress of the Congregation de Notre-Dame by the Pupils of the First Class, on the Festival of Saint Ursula. — Read by Miss McGee.]

Dark is light of Prophecy — no heavenly dews distil
On Sion's rock, on Jordan's vale, or Hermon's holy hill—
" Save us, O Lord!!" the Psalmist cries, pouring his soul's complaint;
Save us, O Lord! in those our days, for Israel has no Saint.
Not half so dark the sky of night her starry hosts without,
As the night time of the nations when God's living lamps go out.

But wondrous is the love of God! who sends his shining host,
From age to age, from race to race, from utmost coast to coast;
And wondrous 't was in our own land—e'en on the spot we tread—
Ere yet the forest monarchs to the axe had bowed the head,
That in our very hour of dawn, a light for us was set
Here on the royal mountain's side, whose lustre guides us yet.

'T is pleasant in the gay greenwood — so all the poets sing—
To breathe the very breath of flowers, and hear the sweet birds sing;
T is pleasant to shut out the world, behind their curtain green,
And live, and laugh, or muse and pray, forgotten and unseen;
But men or angels seldom saw a light to heaven more dear
Than Sister Margaret and her flock, upon our hill-side here.

From morn till eve, a hum arose above the maple trees,
A hum of harmony and praise from Sister Margaret's bees;
Egyptian hue and speech uncouth, grew fair and sweet, when won
To sing the song of Mary, and to serve her Saviour Son;
The courier halted on his path, the sentry on his round,
And bare head blessed the holy nun, who made it holy ground.

There came a day of tempest, where all was peace before—
The Huron war-cry rang dismay on Hochelaga's shore—
Then in that day all men confess'd with all man's humbled pride,
How brave a heart, till God's good time, a convent serge may hide.
The savage triumphed o'er the saint — a tiger in the fold —
But the mountain mission stands to-day! the Huron's tale is told!!

Glory to God who sends his saints to all the ends of earth,
Wherever Adam's erring race have being or have birth,
Glory to God who sheds his saints, our sunshine and our dew,
Through all the realms and the nations of the old world and the new,
Who perfumes the Pacific with his lily and his rose,
Who sent his holy ones to bless and bloom amid our snows.

Dear Mother of our mountain home! loved foundress of our school—
Pray for thy children that they keep thy every sacred rule,
Beseech thy glorious Patron — Our Lady full of grace —
To guide and guard thy sisterhood—and her who fills thy place,
Thy other self to whom we know all glad obedience given—
As rendered to thyself, will be repaid tenfold in heaven!

For thee, my Country! many are the gifts God gives to thee,
And glorious is thine aspect from the sunset to the sea;
And many a cross is in thy midst, and many an altar fair
And many a place where men may lay the burthen that they bear,
Ah! may it be thy crowning gift, the last as 'twas the first
To see thy children at the knee of Margaret Bourgeoys nurs'd.

Villa Maria, October, 1865.

RECOGNITION.

(Translated from the German).

There comes a wanderer, staff in hand,
Homeward returning from distant land.

His beard is tangled, his face is brown;
Will they know him again in his native town?

'T was a youthful comrade, true and fast;
Once many a wine cup between them passed.

Yet strange—the toll gatherer knows him not;
Do beard and sunshine his features blot?

He shakes the dust from his trodden boot;
He turns in silence, with brief salute.

Behold his true-love stands at the door;
" Thou blooming fair one, welcome once more?

But the maid, unconscious, remains unmoved!
She knows not the voice of her own beloved.

He bends his step t'ward his childhood's home.
To his cheeks so brown the tear drops come.

Near the cot his mother is wending her way;
" God bless thee, beloved,"—'tis all he can say.

The mother—she turns and shouts with joy;
In her arms she is clasping her truant boy.

Though the sun may swart, and the beard may grow,
The mother, the mother her son doth know.

SCIENCE.

Pleasant Ways in Science.

No. III.—Identity and Change.

To be the same, and yet different, is one of the curious problems which science presents to us. It appeals to us when we encounter the question of personal identity, and are certain that the old man passing away from us down the vale of time is the same individual that, eighty years ago, commenced his visible being under the care of nurses, who supplied the wants of infancy, enabled him to grow to childhood, to youth, to manhood, to maturity, and then to old age. All through life identity and change are exhibited to us. Each breath takes away a portion of the being that was, and brings into our organization a portion of the being that is to become; and yet we feel there is a larger and broader identity of individuality preserved throughout all these changes than can be accounted for upon any principle of discarding physical organization from our reckoning, and looking only to the spiritual essence that has pervaded and animated each stage. Whatever may be the nature or the mode of connection of mind and spirit, they seem so bound together, that all the gradations of our being may be compendiously spoken of as parts of the one enduring I.

Psychologically, the I may be conceived to begin with its own consciousness, and to endure so long as that consciousness remains. If, endeed, as some have supposed, consciousness went to sleep for ages, and then revived, only a prolonged slumber would have affected the I, and that slumber of ages might seem to it only like a momentary interruption of those processes of thought, feeling, and sensation by which we know that we exist.

We cannot look upon our physical organization as nothing more than a machine which our mind or soul plays upon like an instrument, or receives messages from like a king. It may perish while we remain. It does so perish day by day, and we do remain. The new materials take the place of old ones, but those materials which help to compose us at any moment seem to constitute a veritable and, for their time of office, an essential portion of ourselves.

Passing from conscious identity in the midst of change, let us take a survey of the lowest class of change and identity that we can conceive; and we find it beautifully illustrated in a dialogue in Cersted's *Soul in Nature.* The scene is a waterfall, and the Swedish philosopher makes one of his speakers exclaim, "You here receive an impression of the fall of a great mass of water, which every time comes from the same enormous height, and always encounters the same obstacles. The dispersion of the drops, the foam, the sound occasioned by the fall, as well as by the roaring and foaming of the water, which always arise from the same causes, ever remain the same. In the impression which all these things produce upon us we feel a variety, but at the same time a totality; or, in other words, we feel the variety of the single impressions as the effect of one great action of nature produced by the peculiar conditions of the locality. Perhaps the invariable in this phenomenon might be termed the thought of Nature inherent in it." (1)

It is the peculiar function of organic nature to exhibit a higher kind of identity amid change, and the quantity of regulated and co-ordinated · otion that takes place in an organism is a measure of its perfection and importance. The animal stands higher than the tree, and its various processes of growth and action are dependent upon or associated with the putting together and the taking to pieces of more complicated substances than those which constitute the great bulk of the plant. The muscular system of animals exhibits a complexity of chemical formation corresponding with its elaborate arrangement of parts; the nervous system of animals is remarkable for its chemical complexity; and no thought, feeling, or volition occurs in a living body, without a multitude of atoms undergoing oscillation and changes of place.

If we consider our globe as an individual orb, we trace again the co-existence of identity and change. In one sense, it is certainly the same globe as that on which the Mastodon trod with monster step—the same as that across the fields and lakes of which the Pterodactly, or great flying lizard, stretched his dragon-wing—the same as that over whose morasses gigantic ferns waved their branches at one period—and in whose seas, in a remoter age, the so-called Eozoon built his complicated house. Nay, we may go further back, and accepting as probable the nebular hypothesis, we find it the same globe as that molten ball which resulted from the condensation of those thin and subtle gases that were the physical progenitors of all the structures it now contains. Whatever name it bore amongst the immortals, by that same name, bearing testimony to its identity, it may be known through all the ages of future and of ceaseless change. Its destiny may be to pass through modes of existence as different from that in which we now find it, as its present form and aspect differ from the nabulous cloud, or the seething fiery ball, and it will still be what man in his day denominated the earth—but yet how changed!

Mental identity is evidenced by continued and recurring consciousness. Could we conceive a being that only thought and felt once in a thousand years, he might be as certain of his existence and of his identity as another being capable of evolving thought and becoming conscious of feeling any number of thousand times in a second. We have clocks with short pendulums, and clocks with long ones; and could we construct a chronometer with a pendulum so long, that it would require ages for the completion of its gigantic sweep, its far-separated beats would bear the same relation to each other, and testify to the identity of the instrument, as completely as does the quick and busy ticking of the little watch.

We cannot limit the time distance between the co-ordinated successions that may be comprehended under one identity, nor can we limit the space distance of portions of one great whole. In the fabric of a little ball which we can hold between our fingers incessant motions are going on, but yet the ball remains the same for its appointed time. All its particles, with all their movements, are, so to speak, under the dominion of, and are the expressions of, the same idea. The globe, with its mightier changes, has a similar identity; the solar system is *one* again in its harmonious relations—ever changing, but yet the same. May we not go further, and see a still more gigantic oneness in the universe, imaging the greatest oneness which man is able to conceive?

It is common, though scarcely philosophical, to speak as if each globe and system constituted an isolated existence. Modern philosophers have indeed imagined—without sufficient reason—that the sun continually receives additions to his mass in the shape of bombarding meteors, whose crash against his sides they suppose the physical cause of the renewal of his heat; and comets, in their eccentric orbits, have been thought likely to roam within the attraction of bodies powerful enough to stop their wanderings and appropriate their materials. But there is a wider supposition that seems to have the reasoning of analogy to commend it, and according to which all the matter throughout the universe is in eternal flux. Here nebulæ condense into planets, or suns; there suns and planets dissipate into nebulæ. Astronomers and physicists fill space with an ether, whose vibrations are light and heat; but if such an atmosphere of space exists, why should it be subject to vibrations only? Why should not, as some have supposed, this all-enwrapping ether-sea have its currents and it waves? Why should not its very material be condensed in this place, and renewed or re-etherized in that? To be anything which concerns *physical* science, this ether must be a form of matter; and if so, why should not we consider it as an atmosphere common to all worlds, and possessing properties, in reference to all the host of heaven, bearing some analogy to the properties which an individual atmosphere bears to an individual globe?

In a former number of the *Intellectual Observer*, an instrument, the "Rigid Spectroscope," an invention of Mr. Browning, was described as devised for the performance of some experiments suggested by Mr. Balfour Stewart. That able physicist wished to see whether, by moving a spectroscope from a low latitude to a high one, and thus materially changing the force of gravity, any motion, however slight, would be

(1) We quote this passage from Bohn's edition of the translation made by Leonora and Joanna Horner. We have omitted the world "*superficially,*" which in the translation precedes " termed," as it can scarcely, in its ordinary acceptation, express Cersted's meaning.

made in the position of certain spectrum lines. In point of fact, he wished to try whether light could be weighed. We believe the Admiralty will assist in the investigation, and that before long a ship will carry the instrument to some appropriate place. There are only two probable suppositions with respect to light, heat, and so-called "imponderables," either that the ether whose vibrations they are supposed to be, could be weighed if apparatus of sufficient delicacy were contrived, or that gravitation is not an essential quality pertaining to matter under *all* conditions, but uniformly making its appearance under *certain* conditions. The inquiry is full of interest, and when conducted to a successful issue, will open the way to some of the widest and grandest of investigations that science has reached.

Chemistry opens before us very curious questions of identity and sameness. It shows us instances of the same substances having widely different properties in different conditions. The chemist recognizes two singular classes of bodies, the one he terms *isomeric* and the other *allotropic*. The isomeric consist of substances differing widely in appearance and properties, and yet composed of the same proportions, of the same materials. In some of these bodies the quantities of the elements are the same in actual weight, in others the proportion is kept, but the quantities may be twice as great, or even thirty times as great. The separate bodies of an isomeric series receive separate names, but allotropic bodies of the same pair or series have only one name, being considered as the same thing in two or more different states. Phosphorus is known in several states. Professor Miller says, "Phosphorus assumes several different forms under the influence of causes apparently trifling. The transparent variety when kept exposed to light under water assumes a second form, which is white and opaque, and somewhat less fusible. (1) It has a specific gravity of 1,515, while phosphorus becomes reconverted into the vitreous variety by a temperature not exceeding 1220. A third form is obtained by suddenly casting melted phosphorus; it is perfectly black and opaque; while a fourth, or viscous modification, anhalogous to viscous sulphur, may be obtained by heating very pure phosphorus to near its boiling point, and suddenly cooling it. A fifth form occurs in the shape of red scales, which are obtained by the spontaneous sublimation of phosphorus in the Torricellian vacuum (2) when exposed to the rays of the sun."

This red phosphorus may be obtained by other means, and has been extensively used in the manufacture of lucifer matches, a most unhealthy business when common phosphorus is employed. It is not soluble in some liquids, like bisulphide of carbon, which dissolves common phosphorus. Instead of catching fire in the open air, as common phosphorus does at a comparatively low temperature, it must be heated to 3000 before such action takes place, and instead of acting like common phosphorus as a powerful irritant poison, it may be swallowed with impunity.

It is impossible to place limits to the variety of substances that may be produced by different modes of arranging the same quantities of the same elements in various patterns. We recognize boundless diversity, but when does the identity stop? Is there only one ultimate substance capable of existing in different states? It is obvious that speculations concerning identity and change have a wide field in the regions over which chemistry presides. We have merely indicated some of the simplest, and with these for the present must be content.

The astonishing changes which animals undergo from the egg to their complete form illustrate other phases of the same theme. All creatures that we know of originate in a bud or an egg. Probably the egg always appears at some part of the series, and it is now certain that the most developed creatures, the mammalia, thus commence their being. Thus man and the silkworm both spring from eggs. In the higher forms of animals the hatching process precedes birth, in the lower the egg is born into the world, and changes take place within it which eventuate in the appearance of the infant stage of the creature that is hatched.

Natural history abounds in remarkable illustrations of the diversity of appearance presented by the same animal at different stages of its existence. In the insect world we know the caterpillar, the chrysalis, and the butterfly. The young Cyclops, a well-known water flea, common in all ponds, and with which our microscopic readers must be well acquainted, differs greatly from the adult form in the shape of the body, the absence of the long tail, the want of antennæ, and many other particulars. Still more remarkable are the differences between the young crab, in shape like a helmet with a tail to it, and the adult individual, and between the young star-fish, beginning life like a painter's easel, and the full-grown form.

What constitutes the individual identity of creatures that have no continuous consciousness, or no consciousness at all, and which in their separate stages differ as much as if each stage constituted the existence of a distinct being? At one time it was thought by some philosophers that all the organs and apparatus developed in subsequent life-stages existed in the first stage in a rudimentary form. This notion is untenable. The egg-stage of animals, widely differing from each other, may be indistinguishable, and yet in each egg some special arrangement of forces and materials exist which determines the kind of development that shall ensue; and in animals that pass through many changes of form and aspect, the form that precedes is, in effect, the parent of that which is to follow.

Are we to regard the seed and the plant as belonging to one individual identity. We cannot do otherwise; and in this case we have to note that from the seed the infant plant really grows, and the adult plant grows from the infant germ. The entire plant, at any one time, is continuous in its structure. But there are differences between buds and eggs, and must we take all the beings that arise from animal or vegetable buds of the same individual as partaking of its individuality? A bud may be, for example, a portion of an individual plant, and may be developed into a similar plant—aphides or plant-lice produce numerous offspring by buds as well as others at certain periods by eggs. Such cases are rather multiplications of the individual, than the production of fresh individuals.

We are accustomed to regard an animal as something complete in itself; but what shall we say when an organ of reproduction moves about as a separate thing from the creature of which it is a dissociated part? Natural history presents these curious problems. Facts of this kind have appeared, and more will appear from time to time, in our pages. They suggest profound and interesting thoughts. In this paper we have only approached the threshold of great questions. We have skimmed over a wide surface, hoping rather to stimulate inquiry in many directions than endeavouring to satisfy it in any one.

Intellectual Observer.

Are there other Inhabited Worlds? (1)

Are there on any of these globes which seem to be moving around us beings formed like ourselves, or animals, or any plants? Do people on the Moon contemplate our Earth, a glorious orb in their firmament, and spy out our actions through telescopes as we attempt to spy out theirs? Before the evening is finished I hope to be able to answer these questions in a satisfactory manner.

Let us examine, in the first place, the conditions essential to the existence of the organized beings with which we are familiar, and then we will try to discover wether such conditions are found on any other celestial body. It will only be necessary to investigate a few of these conditions, because if we find any that are absolutely essential to life, whether animal or vegetable, missing on other globes, our purpose will be fulfilled. They can not be inhabited.

To sustain the life of an animal three things are necessary. It must have air, water, and food. Why is this the case? We all know how soon life is extinguished if the supply of air to the lungs be cut off; the person turns of a livid blue, becomes insensible, and soon dies. Or by breathing the noxious gas that arises from the burning of charcoal the same result occurs. One of the elements of the air, a fifth part of its bulk. is a gaz—oxygen. It possesses the power of sustaining the operation of burning. In a stove, for example, if we desire the burning to be accelerated, we increase the draught and let in more air—that is, more oxygen; if we desire to reduce the rate of combustion, we diminish the access of air. If we shut off the supply of air altogether the fire goes out.

So it is in a human being. A burning is continually going on in him, and thus it is that enables him to keep warm in spite of the cold of winter or of the night season. No animal can possibly exist without a supply of air to carry on combustion in its body. When we are about to die, and our interior production of heat is ceasing, we grow cold. That air is essential to the life of even the lowest animals is shown by the fact that, if water be taken in which animal-

(1) M. Baudrimont affirms that white phosphorus is not an allotropic form of commom phosphorus, and that it only varies from the latter by having its surface corroded through partial combustion. If this be so, the general argument is not affected. M. Baudrimont's paper is in *Comptes Rendus*, 13th Nov., 1865.

(2) The upper and empty part of a barometer tube is a Torricellian vacuum. The air can only press up into the tube a column of mercury equal to its own weight. The tube is filled in the first instance, and the mercury falls till the air column is balanced.

(1) A Lecture delivered before the Young Men's Christian Association of New York by Henry Draper, M. D., Professor Adjunct of Chemistry in the University of New York.

cake are swimming, and cold applied so as to cause it to freeze, a drop remains unfrozen around each of these little animated forms for a certain time after the rest has congealed. Heat is being produced by the animal—to liberate that heat it must be consuming air and burning its body.

Again, in an instance with which many of us are familiar, the respiration of a small animal is shown. If on a cold day you watch a fly that has lighted on a dry window, a collection of moisture, the results of his respiration, will soon be seen in his neighborhood. It is the analogue of the larger condensation of vapor that would be produced were one of us to breathe on the same window. The fly is burning away and vaporizing water with the superfluous heat.

To illustrate the necessity of air to the well-being of animals, a bird may be put under a glass bell jar standing on the air-pump. By the aid of the pump the air can be removed to a large extent from the bell jar, and as soon as the exhaustion is commenced, the bird shows signs of discomfort and becomes more and more restless as the action continues. He would eventually die if kept under the exhausted jar.

To plants air is just as necessary as to animals, although we can not easily demonstrate this by a lecture-table experiment. The larger part of their substance is derived from the atmosphere by the aid of the Sun's beams; but a small portion comes in through the roots. Nature has so arranged the relations of plants to animals that they take out from the air the impurities that have been imparted to it by animals and replace the ingredients that are necessary to the latter If in any planet we could detect the traces of vegetable life, it would at once be a strong argument for the existence of animals there, and *vice versâ*.

But you may think that I have omitted the case of aquatic animals and water plants altogether. They seem to have no access to air, and might be fairly supposed not to require it. You will sustain yourselves in that opinion by citing the case of a man submerged in water who drowns, and by that of a fish brought out into the air that dies. Nevertheless air is necessary to all fishes; for if you boil water and so expel the air from it, and then when cool put a fish into it, he can not live. He is in the same condition as the bird in the bell jar.

The other case, that of a fish dying in the air, is as readily explained. A fish is not provided with lungs as we are, but breathes the air dissolved in water by the aid of its gills. When taken out of water the gills dry up, and the little tufts of blood vessels, of which they consist, adhere to one another so as to be unable to act any longer. Some fish, as the eel, have, however, the means of keeping their gills wet by causing the mouth to remain partly filled with water, and these can be retained on land for many hours and yet live.

Water in its turn is just as essential as air. By its aid food is carried into the body and distributed, and it also acts as a regulator of heat. If we tend to become too warm, as in the summer season, water escapes rapidly from the lungs and skin, and by its evaporation keeps us cool. That such evaporating processes cause a cooling may be proved by an experiment with which many of us are acquainted. It is often desired, when in the woods, to ascertain the direction from which the wind is blowing. We may need it as a guide. There may not be sufficient air stirring to drift away a light object like a straw. Under these circumstances foresters, having wetted the finger, hold it upward at arm's length. A gentle breeze causes the moisture to evaporate more rapidly on the side it first strikes, and the direction is at once indicated by the coldness of that side. So also in the case of the porous earthen-ware vessels used in southern climates for keeping water cool. The fluid that soaks through the earthen-ware, evaporating from the outside, keeps the temperature of the water much below that of the surrounding air.

Lastly, as regards food, but little requires to be said. All know from hard experience how necessary it is. If we do not eat we soon become emaciated and die after a short interval. What is the cause of this wasting away, and why can we not resist it by the will? We have already learned that air is essential to our well-being, because we must have a burning continually going on in the body. But we must also have a fuel to burn, and this fuel is either the food or portions of the body that have been made out of it. If we do not eat and resupply the parts that are consumed, our weight becomes daily less and less, as we see in wasting fevers, until, when a certain point is attained, we die of cold.

The food we require is produced by plants, the remark applying even to meat, which has been extracted from plants by oxen, sheep, etc. That it is combustible can be proved by experiment. A piece of meat or bread, if placed in the fire, burns away, leaving only a little ash; the mass of it having united with oxygen and disappeared in a gaseous form. The same would have happened had it been eaten, though the burning would have been slower and without flame.

It is the combustibility of stimulants, such as whisky and brandy, that renders them valuable in low fevers. Now-a-days the treatment in such cases is to give the patient as much liquor as he can bear without becoming intoxicated; it burns away within him to produce the animal heat he requires, and so saves him to a certain extent from the emaciation that would be produced by the burning of his body. For the healthful performance of the functions of the system a temperature of nearly 100 degrees must be maintained by man; if he becomes much cooler than this he will die of cold. The sensation of cold piercing to the very marrow of the bones, so keenly felt by those ascending high mountains, is due to the attenuated state of the air in such localities, not enough can be taken in by the lungs at each breath to keep the body burning at a proper rate.

We are now ready to glance for a few moments at the construction of the solar system. Around the Sun, a sphere 880,000 miles in diameter, there revolve a number of globes; some, the more important, called planets; some the moons or satellites of these planets; and the rest asteroids, or else, if very small, aerolites or meteors. The planets are, of course, the bodies most likely to prove interesting to us, and they may therefore be profitably enumerated. The nearest to the Sun is Mercury, 37 millions of miles distant; next comes Venus, 68 millions of miles distant; then the Earth, 95 millions of miles. Outside of us, or farther from the Sun, are Mars, 112 millions of miles from that luminary; Jupiter, 485 millions; Saturn, 900 millions; Uranus, 1800 millions; and Neptune, 3000 millions.

An idea of the comparative size of these bodies and their distances from the Sun may be gained from a table constructed by Sir John Herschel:

The *Sun*, a globe two feet in diameter.
Mercury, a mustard seed, diameter of orbit 164 feet.
Venus, a pea, diameter of orbit 284 feet
The Earth, a larger pea, diameter of orbit 430 feet.
Mars, a large pin's head, diameter of orbit 654 feet.
Jupiter, an orange, diameter of orbit half a mile.
Saturn, a small orange, diameter of orbit one and one-fifth mile.
Uranus, a cherry, diameter of orbit a mile and a half.
Neptune, a plum, diameter of orbit two and a half miles.
The nearest Fixed Star, distance fifteen thousand miles.

If we can succeed in rendering it probable that on any of these bodies there is life, we shall be led at once to extend the sphere of animated nature infinitely. For we know that each of the countless multitudes of fixed stars, which delight our gaze on a clear evening, is a sun, shining, as our sun does, by virtue of its own light. At distances vastly greater than these are collections of stars, which, though they may in reality be separated as far from one another as the nearest fixed star is from us, yet seem to be closely packed together These, the resolvable nebulæ, are stellar systems of prodigious extent. Many are not bright enough to affect the naked eye; and who shall say what immense numbers there may be invisible even with the telescope?

We may argue from analogy that all these suns, many of them larger than ours, are surrounded by trains of planets, revolving around them at various distances. If on any of the planets of our solar system life can be maintained, why not on those planets too? and does it not seem reasonable to suppose that all those bodies have been created for some other purpose than merely occasionally to illuminate our skies? Is this little speck in the universe where we are existing, and which is visible to only two or three of its immediate neighbors, the only seat of life?

"Each of these stars is a religious house;
I saw their altars smoke, their incense rise,
And heard hosannas ring through every sphere.
The great proprietor's all-bounteous hand
Leaves nothing waste, but sows these fiery fields
With seeds of reason, which to virtue rise
Beneath his genial ray."

But you may say, How do you know that those other worlds are not composed of such material that life is there impossible? Science has within the last few years stretched her hand across the almost immeasurable distances which separate us from the fixed stars, and told us that there are in them many of the substances with which we are here familiar. It would lead us too far from our subject to indicate the manner in which so grand a result has been reached. I can only tell you that we are able, by examining the light coming from the stars by a prism, to detect their composition, just as if we had fragments of them in our laboratories. Spectrum analysis has made the chemist's arms millions of millions of miles long.

Let us examine our planetary neighbors, and ascertain what are the chances of inhabitation upon them. The two planets that are nearer to the Sun than the Earth may be dismissed at once. The most reliable researches lead astronomers to suppose that Mercury and Venus are too hot to permit of either animal or vegetable life. Venus is regarded as being red-hot, and Mercury even hotter. If such be the case, we must of course presume that they are uninhabited.

The first planet outside of the Earth—Mars—is 50 millions of miles more distant from the Sun than we are. When it is favorably situated its surface can be closely scanned through the telescope. It seems to me to be by far the most interesting object in the heavens from its similarity to the Earth.

In the summer of 1862, when my large telescope had been completed, Mars was often observed, and showed appearances some of which are represented in the * * * * cut drawn by Professor Phillips. There was visible, in the first place, an expanse of water covering a large proportion of the Southern hemisphere, and of a greenish hue. The remaining parts, at the upper portion of the picture, are land of a reddish tinge, assuming the figure of continents. In addition—and this is a point of peculiar interest—at the north and south polar regions there are accumulations of snow, presenting appearances strictly analogous to those at the arctic and antarctic regions of our globe.

Let us recall the condition of our Northern Hemisphere. In winter snow falls and covers it with a white envelope, extending for six months to a latitude certainly as low as the northern border of the United States. If the earth were viewed from a distance, there would seem to be a white spot surrounding the north pole. As summer came on this white spot would begin to disappear, melting away at its southern border, and to the distant observer would seem quite insignificant at midsummer. Precisely similar phenomenon is witnessed at the poles of Mars, and hence we see that he too has seasons similar in their nature to ours, a warm summer and a cold snowy winter. As his year is almost equal to two of ours, each season is twice as long as with us.

There is still another point of resemblance. On watching the planet Mars carefully through a large telescope, we observe that his surface is not always the same in appearance, but that dark spots occasionally are visible, and cover large parts of it. They are variable in extent and outline. These are obviously clouds floating in his atmosphere, the source whence falls the winter's snow and, doubtless, though we do not see it, the summer's rain.

There is then another body, revolving as the Earth does around the Sun, as far as we can judge suited to the abode of sentient beings. It has air, water, alternations of seasons, snow, rain, and, possibly, vegetation. It is, to be sure, half as far again as we are from the Sun, the source of light and heat, but is not cold enough to be perpetually frozen and therefore sterile.

The question at once arises, do you discover upon its surface any traces of the works of man, are there tokens of great cities and visible lines of road? As our telescopes are at present, we are too far off to see any of these things, even if they are there. No power yet applied would enable us to distinguish at this distance an object 50 miles square. What we may do in the future it is, of course, impossible to predict. One of the greatest obstacles to distinct vision is our own atmosphere. Its currents and motions tend to confuse the outlines of objects, and, according to my experience, a whole year may pass without the occurrence of more than one good night. The only remedy is to carry the telescope as high up on a mountain as possible, so as to leave below the more injurious portion of the atmosphere. It might be possible to work 15,000 feet above the sea in the neighborhood of the equator.

In the list of planets given, four large ones were placed outside of Mars, that is, farther from the Sun. But with these we have not time to deal. The only remark necessary to be made is, that on two of them, Jupiter and Saturn, there is reason to believe both air and water exist.

But you will say, why is the moon overlooked all this time? She is close to the Earth, and must possess similar conditions as to light and heat; are not the probabilities strong that she is inhabited?

A few years ago there was published in the daily papers of this city a desription of pretended discoveries in the Moon which excited at the time a great deal of attention. It was stated that Sir John Herschel had taken to the Cape of Good Hope a lens of 24 feet diameter, and with it had seen a variety of objects, animals, buildings, and even a species of men. The human beings were described as having wings like a bat, but nevertheless they evidently conversed and were familiar with polite actions, such as peeling fruit for one another. This, "the Moon Hoax" as it is termed, imposed on very many persons, and when its falsity was discovered, left behind an unfortunate skepticism as to statements that are really true.

Let us examine the actual state of the Moon, and see what the probabilities of habitation are. We will ascertain the more prominent peculiarities, and then I will show you some of them by the aid of a photograph enlarged by Star's calcium light and lens.

On looking at the Moon with the naked eye, certain markings are visible, dark and white spots. Before the invention of the telescope the dark spots were called seas, the bright ones land. But we now know that there is not any large collection of water on the side of the Moon that is turned toward us. Why is that expression, "the side turned toward us," used? *We only see one hemisphere of the Moon: one side is perpetually turned away from us.*

A telescope of even moderate power shows at once, particularly if the Moon be only six or eight "days old," that her surface is very rugged and much broken. The northern part is less rugged than the southern, and we see that the so-called seas are great valleys many hundred miles across. They may be the basins in which seas formerly were, but they now contain no water. Nor do we find on any part of the visible side tokens of either air or water. Recalling the fact that no animal or plant can live without these essential materials, we are convinced at once that there is no use in searching for inhabitants there.

But there are strong reasons for believing that water must exist somewhere on the Moon. That fluid enters as an ingredient into the composition of rocks, and it is a cause of volcanic eruptions. The face of the Moon is largely composed of abrupt rocky precipices, and volcanic action has been in past ages frequent on it.

We are sure that the water is not floating about in the shape of dense clouds, for we should see them easily enough through our telescopes, and collections of ice and snow would now and then make their appearance. Of late, however, it has been demonstrated mathematically, that the side nearest to us is farther away from the Moon's centre of gravity than the more distant side. It is, so to speak, down hill from this face to that, the amount of declivity being about 30 miles. So there might be air and water 30 miles deep on the opposite side, and we should not see them here. There may be inhabitants there, but our chances of making their acquaintance are small enough. It was at one time proposed by some enthusiastic astronomers to communicate with the inhabitants of the Moon by erecting on one of the great plains of Asia stone structures representing a certain geometrical problem, "in a right-angled tri-angle the square of the hypothenuse is equal to the sum of the squares of the other two sides." It was hoped that if there were intelligent inhabitants on the Moon who had discovered the truths of geometry they would answer by marking out on one of their plains some other problem in response.

We see from our physiological investigation of the subject how futile such an attempt would have been. The inhabitants on the far side of the Moon, if there are any such, never see the Earth unless it may be low down in the horizon and dimly. If they existed on the centre of this side, they would see her as a glorious globe, fourteen times as large as the Moon seems to us, shining with a pure light, variegated with clouds, and revolving like a gigantic clock directly overhead. Now Europe, Asia, and Africa would be visible; in a few hours they would set, and North and South America, in their turn, come into view. They would have no need of watches. Our large cities would be visible through a telescope, a spot 500 feet square being distinctly perceptible. But it is of no use to speculate on the appearance of things that are not seen.

So far from perceiving any visible traces of human habitation on the Moon through our telescopes, she presents to the eye only a desolate sterile waste. There are no tokens of activity. Even her volcanoes are extinct. We are able to determine with precision their unchanged condition by the aid of photographs taken from time to time. They show no change though an interval of years may have elapsed. It is true, nevertheless, that minute changes may be occurring, for the difficulties of obtaining first-class photographs are so great that slight eruptions might be overlooked. (1)

The taking of a photograph of the Moon may be compared to getting the likeness of a man who is rapidly walking. We can not fasten her with a clamp as they do one's head at a photographer's establishment, it is necessary to neutralize the motion by another precisely similar. This fortunately we can accomplish by fine clock-work so contrived as to make the telescope by which the photograph is taken point steadily at the same part. But there is another motion we can not neutralize, arising from the tremors of our air. Any one who has looked across the top of a hot stove at objects beyond will have perceived that their outlines are confused, and that they seem to tremble or vibrate rapidly. Precisely such movements are taking place in the air above us, and these cause the mountains on the Moon to twinkle like a star. During two years, in which I took photographs of the Moon

(1) A fac-simile of Dr. Draper's photograph of the Moon was published in *Harper's Weekly* for March 19, 1864.

every night that she shone, only three good nights occurred, and even on these there was some vibrating motion. Professor Bond, of the Cambridge Observatory, said that he had never in his lifetime seen a perfectly faultless night. If, then, it were desired to convey to you by our former simile of a man walking the difficulties of Moon photography, it would be necessary to superadd that the man was afflicted with St. Vitus's dance.

(To be continued.)

EDUCATION.

Intellectual Education. (1)

Intellectual Education has a twofold object: first, the development of the intellectual powers; and second, the communication of knowledge. The mere communication of a certain amount of knowledge seems to be the object of a great deal of what passes for good education. But the matter of acquisition being ill selected, and the laws of the human intellect disregarded in the mode of presenting it to the mind, it happens that even this object is most imperfectly attained. *Words* instead of *things* form the staple of education; yet the merest smattering remains with most people, in after-life, of the languages at which so many of their early years are spent. Sometimes a certain amount of facts in history or natural philosophy is communicated in education; but being addressed to the memory, and taken in passively, it leads to nothing. When ideas are admitted without any working of the reflective faculties, they take no root, but lie in dead, useless masses on the surface of the mind. The communication of even real knowledge, for its own sake, is of secondary importance in early intellectual education. The main thing is the formation of habits of correct observation and clear reflection. The mind derives its knowledge, in the first place, from external objects acting upon the organs of sense. Sensations being once received, the corresponding ideas undergo various modifications, by the processes of comparison, abstraction, reasoning, &c. When the impressions of sense are indistinct, the subsequent operations share in the uncertainty and imperfection. Intellectual development, therefore, requires that the powers of accurate observation should be first unfolded. Clear ideas being furnished by them, the various intellectual habits of abstraction, classification, and reasoning, may be rendered quick and correct. The communication of knowledge in early education is primarily useful as the means of forming these habits. Education is a preparation for after-life. It should not attempt so much to communicate extensive knowledge as to excite the love of it. The results of the observations of the most eminent observers, received passively into the mind, are worthless compared with the habit of observing for one's self. In the one case, a man enters life with cumbrous stores which serve no purpose, because he knows not how to use them. In the other, he comes with a slender stock thoroughly at command, and with skill to increase it by daily fruits of original observation and reflection. Many children, the wonders of admiring circles, turn out common-place men, because their acquisitions are never converted by mental assimilation into part of their own nature. Others, pronounced idlers, while in fact they are developing their faculties after a fashion of their own, stand out as men, and take a lead in the business of life.

The development of the intellect begins in the infant. He is perpetually receiving sensations from the objects about him; and while awake, he is constantly seeking to get things within his grasp, to feel them, and see them. There is an impulse within him to find out the properties of every object he meets with, so fresh and vigourous, that it may well seem enviable to students dulled by exclusive intercourse with books, and long abstraction from the actual world. This precious activity ought not to run to waste. It is in our power so to guide it, that instead of dim and imperfect impressions, speedily overlaid, confused and obliterated by other dim and imperfect impressions, the child shall constantly receive from without clear sensations, and by gradual steps attain full and correct ideas of the objects about him. We can present real objects to his senses in a certain order, and in such a manner as to attract his attention, until he becomes perfectly familiar with their sensible qualities. When he has got the idea of an object, or of one of its properties, and not before, we can give him the name. The name given when his interest is excited will be firmly associated with the idea. The child's attention is first drawn to the simplest sensations. The elements being clear, their combinations will be taken in clearly; and the perceptions of resemblances or differences must be also clear. Thus, by gradual steps, of which each is clear and certain, the development proceeds.

For the effective promulgation of this great principle of teaching by reality, which all philosophy of the mind supports, and which is destined to revolutionize education, the world is indebted to PESTALOZZI. It is practically exemplified in the well-known "Lessons on Objects" of Miss Mayo, in which the lessons are arranged so as to develop successively, by real objects, the faculties of observation, comparison, classification, abstraction, and to lead to composition.

The child's strong impulse to acquaint himself with things must not be blunted by a premature attempt at teaching him to read, or by that absurd and confusing process, as it is commonly practiced, of teaching him his letters. The child must know many things before reading or spelling. The principle of submitting objects in a certain progressive order to the examination of his senses must be the basis of his intellectual education; and the habits of correct observation so formed must be systematically exercised, so as to insure their continuance throughout his existence.

Upon this knowledge of things, as a basis, the child acquires his mother tongue, never learning any word until he has had the idea, and felt the want of the name. Names, however, are for the most part complex sounds, and a very considerable and careful training of the organs of speech is necessary, before they can be uttered correctly. Here also a progressive order must be observed. We should begin with the simplest words, and gradually lead the child to the pronunciation of them, by requiring him to repeat after us the simple sounds of which they are composed. The child teaches us so much himself when he begins with some such word as "ma,", or its repetition, "mama." The syllable "ma" is composed of two simple sounds, a vowel and a consonant. A mother, without any knowledge of the principle, often exemplifies it when she pronounces this syllable for the child's imitation. She makes the two distinct sounds, *m* and *a*, (as in bar,) with a slight interval. She does not pronounce *em* and *a*, (as in fate,) the *names* (1) of the letters, but she goes through the peculiar closing of the lips, by which *m* is produced in combination, and then sounds *a* as it is sounded in the word. The child imitates each motion, and at length utters the combination. In the same progressive manner in which a child learns to take in the most complex sensations, and to conceive the most complex ideas, his organs are brought to utter the most complex sounds correctly, and words become associated in an indissoluble union with the sensations and ideas they represent.

This is the basis, the only secure basis, on which to raise up a strong and clear intellect. When the first impressions are clear, and all the words that are known represent clear ideas, the processes of abstraction, classification, and reasoning may be made prompt, vigorous, and true.

At a very early period the child should be led, still from observation of real objects, to form ideas of number. And here also the progress must be by the most gradual steps. One finger, two fingers, three fingers. One finger and two fingers are three fin-

(1) From a Prize Essay on the Nature and Value of Education by John Lalor. Published by the Central Society of Education. London.

(1) We must be careful not to confound the *names* of the letters, as *bee, see, aich, double u,* with their *sounds* in combination.

gers. He must remain for a considerable time in the simplest and most obvious ideas. Here, if possible, more than anything else, is it necessary that each idea should be, as it were, worked into the texture of his mind before he proceeds to the next. The most complex combination of number are made up of the simplest ideas; and, with many persons, ideas of numbers continue through life indistinct, because the simple elements of which they are composed were never clear in their minds. There should be none of the "senseless parroting" of the multiplication table, but a progressive attainment of real ideas of number from real objects, — addition and subtraction from real addition and subtraction; and from these that species of repeated addition which is called "multiplication," and that species of repeated subtraction which is called "division." Ideas of number, and of the elements of calculation, being obtained from real objects, and from the different kinds of real objects, the mind may be led to clear *abstract* ideas of number. Clear ideas of number tend powerfully to general clearness of mind, and affect many subsequent acquirements. Confused ideas of number spread a haze and dimness over the whole field of knowledge.

Amongst the properties of external objects, of which the child obtains the knowledge by his senses, his attention may be early directed to their size and distances, and he will readily take in the simple ideas of measurement. He will have no difficulty in finding one thing to be longer than another, and, with the help of his clear ideas of number, one thing to be twice or three times as long as another; and two things, which can not be brought together, to be equal, by finding both equal to some third thing. His eye and hand should be exercised in measuring, and the engagement of both will interest him, and gratify the impulse to mental and bodily activity, which is almost incessant in childhood. Real measures of every kind, linear, superficial, solid and liquid, and weights, — as inches, yards, linear, square, and cubic feet, quarts, bushels, ounces, and pounds, — should be set before him, until his eye and touch are perfectly familiar with them. These should take the place of the tables of weights and measures, which, with so bold a defiance of common sense, as well as of the laws of mind, are given to children to be committed to memory, before they have a glimmering of their meaning.

From ideas of distance he will easily and naturally proceed to examine the position of external objects. Being presented with the simplest ideas of position, as straight lines, angles, &c., he delineates them on paper, or a slate, from the outlines of objects progressively set before him. He is gradually led on to many of the relations of triangles and circles, — the elements of geometry and of linear drawing.

When the eye has been in some degree trained to the observation of form, and the hand to the imitation of outline, the child may begin to read; not with letters, but sentences containing words of which the object is before his eyes. He will learn the letters of print by a species of analysis, and by attempting to form them with his pencil, and his formation of the writing character, will be much more free and rapid by the accuracy and pliancy which drawing has given to his eye and hand.

When people attempt to teach children geography, by compelling them to commit to memory a number of proper names, it is almost needless to say, that they are following that wretched system of word-mongering which has so long reign d supreme in every department of education. When they set a globe or a map before his eyes, they do what is, indeed, much better, but they still begin at the wrong end. Here, as in every other branch of intellectual instruction, we ought to begin with the *existing experience* of the child, and evolve out of it, by the most gradual progression, what we want him to know. We must begin with the reality which is *in him and around him*, and make known to him what he can not see, by means of that which is before his senses. A map, or plan, of the school-room or the play-ground, which he should be led to draw for himself, ought to be the first lesson in geography. This should be followed by one of his own town or district, which he can verify by personal observation. When he thoroughly understands the relation which a map bears to the reality, he may be led to the map of his country, not crowded with names, but a simple outline, with the principal mountains and rivers and a few great towns marked. In conceiving the extent of a large country, or of the globe, his clear ideas of number, acting upon the real distances which he knows, will secure clearness in the combined ideas. The *natural* divisions of the earth should be the first learned, and the productions, tea, cotton, &c., and animals which are before his senses, referred to their several homes.

Naturally connected with ideas of the surface of the earth are those of remarkable events in different places, and of the past history of the earth's principal inhabitants. Although history, properly so-called, should be perhaps the latest of all studies, there are certain leading ideas of great events and characters, which may be advantageously made known at an early period. As a basis of this knowledge the child must be led to the measurement of time. And here, as before, he must begin with what is within reach of his senses, (or what may be popularly said to be so.) He must learn the comparative lengths of small portions of time,—as a minute, an hour, a day, a week. He should be led to think of the trifling events which he can recollect, in the order of time,—his getting up in the morning—his coming to school—his first lessons—his game in the play-ground. Having learned to conceive events of his own experience, in the order in which they occurred,—extending back over a continually increasing period,—his clear ideas of number, acting upon these clear ideas of his own little chronology, will lead him to a conception of the chronology of the human race. The chronological order will be found the most natural and easy way of presenting such interesting facts of past history as the child can comprehend.

Even if education were carried no farther than this, how great would be its effects! How superior a race of men might be produced by such a system thoroughly worked out! What power of observation, arrangement, and deduction,—what rapidity of eye and dexterity of hand, would be ready for application to any branch of the business of society. What independence of judgment would be generated in such men, by the sound and practical nature of their acquirements. Yet what modesty, from a just apprehension of the extent of knowledge above them; and what a tendency upward and onward, from the spirit of progression infused into all their labors.

It is plain, however, that if circumstances admitted of the education being carried farther, the same principles might be continued. The lessons on objects would flow on easily into complete courses of Zoölogy, Botany, Mineralogy, and Geology; the principle being strictly adhered to of examining real objects, when procurable, and when not, of using good pictures. Geometry, Algebra, Trigonometry, and the higher branches of mathematics, would easily follow, upon the thorough comprehension of the simple relations of number and position. The different branches in Natural Philosophy, exhibited by progressive experiments, would be not so much a labor as a recreation.

There are two deeply important branches of study, which, as they are seldom considered proper to form a part of early education, deserve particular notice. They might be included under the single head of the study of the human constitution, but this at once presents two great divisions, which it is more convenient to consider apart. *Every child* then might be made to possess a considerable acquaintance with

1. The structure of his own body.
2. The structure or constitution of his mind.

It ought to require little reasoning to prove the utility of making these studies a part of general education. Indeed, if education were not beyond all other things governed by mere prejudice and custom, this kind of knowledge would seem the most fitting for universal acquisition, as concerning all men alike and affecting all pursuits. A knowledge of the structure of a man's own body, acquired in early life, would prevent many injurious practices, which, in most cases, are persevered in through ignorance,—such as want of cleanliness, deficient ventilation, excessive or insufficient exercise,—over action of diseased organs. People may be told forever that they should have a regular supply of fresh air; they assent in words, and forget it because it does not get into their thoughts. A single exposition of the use of the blood, and of the part performed by the lungs, in fitting it for its purposes, would stamp the idea deeply, and arouse the mind to act upon it. A thousand precepts against the hideous distortion caused by tight stays would not be half so effective as an exhibition of the organs in the cavity of the thorax,—or a discovery of the facility with which the lower ribs may be bent by pressure. Knowledge of this kind would be an effective aid to physical education. It would remove a host of popular prejudices. It would destroy the trust in confident empirics, and the distrust of regular practitioners. It would enable a patient, and those about him, to afford to a medical attendant that hearty coöperation which in nine cases out of ten facilitates—if it is not requisite to—recovery. To females the study is peculiarly needful. "The theory of society," in the words of Dr. Southwood Smith, "according to its present institutions, supposes that this knowledge is possessed by the mother." She is intrusted with the first and most important part of the physical and moral education of the child. Mothers, in fact, make society what it is; for the physical and moral tendencies which make up character, are generally communicated or excited before the child passes from the sphere of his mother's influence. There is thus a twofold necessity for making this study a part of female education,—to enable women, as individuals, to protect their own health and coöperate in their own physical education, and to enable them as mothers to do all that enlightened reflectiveness can for the happiness of the beings intrusted to them. In addition to these great and obvious utilities, the study of man's physical structure deserves a first place in education as matter of science. No object in external nature presents combinations so varied and beautiful, or instances of adjustment so likely to fill a young mind with wonder and veneration, as the exquisite mechanism of life.

Nor can it be doubted that a knowledge of the human structure, not vague and general, but with considerable minuteness of detail, can be conveyed in an agreeable manner to children. The well-known publication of Dr. Southwood Smith, on the "Philosophy of Health," contains an account of the structure and functions of the human body, which is not only a model of beautiful exposition, but has been found in practice an admirable manual for imparting this kind of knowledge. The whole, or in any case, the fifth, sixth, and seven chapters, of the first volume, might be acquired in no very long period; and there is no existing school study which it would not with great advantage displace. Upon the principle of teaching by reality, the objects themselves should, as far as possible, be presented. A collection of human bones ought to form a part of the apparatus of every school. An idea might be formed of several organs from an exhibition of those of animals. A sheep's heart, for instance, which might always be procured, would give a vivid conception of the human organ, and so of others. The deficiency of real objects might be supplied by colored anatomical plates, which, like many other expensive articles, would become cheap, if a general sense of their utility in education led to an extended demand for them.

A knowledge, not quite so accurate, but still sufficiently so to serve many important purposes, of the powers of his own mind, might also be communicated to the child. Much of the misery with which the world abounds is the result of acts performed from impulse without reflection. To those whose attention from childhood has been absorbed by external objects so as never to have been directed to the operations of their own minds, it seems the most natural thing in the word to give way to a strong impulse. To pause upon the trains of their ideas and feelings, and subject their impulses to examination, are to some persons impossible, and to most extremely difficult. The unpleasantness of the effort accompanying these states of mind hurries men for relief to any decision. There are few persons unsuccessful in life who can not trace their misfortunes to some inconsiderate impulse, —some course determined upon hastily to escape the painful balancing of reflection. Habits of reflectiveness are essential to steadiness of conduct; and they may, by early training, be made easy and familiar as the series of complicated muscular motions by which the hand goes through the process of writing.

A child, whose faculties have been properly called out by previous intellectual training, will have little difficulty in receiving correct notions of the use of his organs of sense—(he will be familiar with their material structure from the previous study) —in giving him a knowledge of the sensible qualities of external objects. He will readily discover that what he has once seen, felt, heard, tasted, or smelt, may be remembered; and thus, that of all sensations there are corresponding ideas. The synchronous and successive associations—the combination of several into one, and the separation of one into several—the mental grouping of like objects together, under one name, and the mental separation of unlike ones—the detection of the different relations of position, proportion, resemblance, difference, and comprehension, and of the composition of the trains called processes of reasoning—in short, the whole phenomena of intellect will easily follow. Nor will it be difficult to make the child discover that there are certain motives or desires which lead him to act as he does; that he eats in obedience to the impulse of appetite; that he strikes from anger, or desire to do others injury; that he is pleased when others approve of his conduct, and pained by their disapprobation; that he loves certain individuals, and would give up his pleasures for theirs; that it is pleasant to make others happy; that some of these desires require to be controlled, and that all are to be regulated by the reasoning faculties. In the acquirement of this knowledge the young mind would be led to turn its attention upon itself, and so to form habits of self-examination. A great insight into human motives would thus be gained, and an extraordinary correctness of moral judgment both on self and others. Reflectiveness, the true soil for the growth of whatever is best in character, would be made general; and the public opinion of a school would acquire such a justness and force, as to become a powerful engine of moral education. It would be difficult to point out a book perfectly adapted to give this knowledge to children. The purpose might be answered by a judicious abridgment of Brown's Lectures, or, still better, by a small compilation from the works of Berkeley, Hartley, Adam Smith, Stewart, Brown, and Mill, and the phrenological writings of Mr. Coombe and some others; avoiding all great disputed questions, and confined to those expositions of the human faculties which may be considered as established. As matter of science, and as affording perpetual illustrations of the Divine wisdom and goodness, the philosophy of the mind is even more deserving of a place in education than the study of man's physical structure. The double necessity of making it a part of female education holds likewise; for in addition to its use for moral guidance and self-government, it is especially needful for the mother, to whom nature and society intrust the early rearing of the child.

Other sciences, as Political Economy, the elements of which ought to enter into general education, need not be particularly remarked upon.

There is one subject which requires a short consideration before passing to the third branch of education, or that which relates to the formation of moral character.

It may be thought extravagant to propose the cultivation of a taste for poetry as a regular part of education, especially for the poorer classes. Yet education, which seeks to develop the faculties of a human being, must be very inadequate if it neglects the culture of the imagination. The power of poetic creation is, indeed, the rarest of endowments, but the power of enjoyment is general. The highest human mind differs not in kind, but in degree, from the humblest. The deepest principles of science discovered by the slow toil of the greatest men, the loftiest imaginings of the poet, having once been revealed in the form of human conceptions, and embodied in language, become the common property of the race, and all who go out of life without a share in these treasures, which no extent of participation diminishes, have lost the richest portion of their birthright. Man rarely feels the dignity of his nature in the small circle of his common cares. It is when brought into communion with the great spirits of the present and the past,— when he beholds the two worlds of imagination and reality in the light of Shakspeare's genius,—or is filled with the sacred sublimities of Milton,—or from Wordsworth learns the beauty of common things, and catches a glimpse of those "clouds of glory" out of which his childhood came,—that he feels the elevating sense of what he is and may become. In this high atmosphere, so bracing to the moral nerves, no selfish or sordid thoughts can live.

But assuredly there is no class in society to whom the sustainment of such communion is more requisite than to the largest and poorest. The harshness of the realities about them requires its softening and soothing influence. It is a good which they may have with no evil attendant. Its purifying excitement may displace stimulants which brutalize and degrade them, Let it not be said that a poetic taste would turn their thoughts from their occupations, or fill them with discontent. Their thoughts will and must fly at times, from their occupations, and find forgetfulness in snatches of drunken revelry, from which they return to labor with double distaste, in mental and bodily exhaustion. A power of enjoying the beauty of poetic creations would afford an easier and far more delicious oblivion of their sorrows. It would send them back tranquilized and refresh—reanimated with hope and faith for the continued struggle of existence. While poetry continues a rare enjoyment, a taste for it may sometimes suggest vain ambition and discontent, but let it be made a universal possession, and it will no more puff up than the common capability of mechanical or manual labor. But it is sufficient for the argument that poetry appeals to faculties common to all. That is our warrant for their educational development. Who shall pronounce that capacities given by God ought to lie idle? Who shall put out the love of beauty which he has kindled? Who shall exclude the bulk of mankind from that rich heritage of noble thoughts, which has been bequeathed, with no restrictions, to the whole human family?

The practical working of this part of education will have many difficulties; but none which enlightened observation must not ultimately overcome. A taste for poetry, of course, can only be awakened in a child by a mature mind which possesses it. Simple and progressive pieces, chiefly narrative, containing natural sentiments, should be presented as a pleasure and a reward. Selections might be made from Goldsmith, Cowper, Scott, Mary Howitt, and others. With constant care to avoid disgust by too long continuance, by unintelligibility, or by exciting the associations of a task, the child would feel poetry an enjoyment, and his powers of appreciation would gradually unfold themselves. The use of tales about fairies, genii, and other supernaturalisms, or of juvenile novels in childhood,—their application to individual characters—the means of cherishing a love of the beautiful in art and in nature--in a word, the culture of the imagination is a deeply interesting and almost untrodden field of investigation; but the present purpose does not require the further prosecution of the topic.—*Barnard's American Journal of Education.*

OFFICIAL NOTICES.

APPOINTMENTS.

EXAMINERS.

His Excellency the Governor General in Council was pleased, on the 4th instant, to appoint Isidore Belleau, Esquire, a member of the Quebec Board of Catholic Examiners, in the room and stead of J. Burroughs, Esquire, resigned.

—

DIPLOMAS GRANTED BY BOARDS OF EXAMINERS.

BOARD OF PROTESTANT EXAMINERS OF WATERLOO AND SWEETSBURGH.

1st Class Elementary (*E.*)—Alice Baker, Melinda M Baird, Sarah J. Boright, Betsey E. Bigelow, Henrietta E. Dow, Gulielma England, Matilda Golland, Zulicka Hollingsworth, Martha Jane Hamilton; Addison M. Janes; Cordelia A. Kennedy, Elizabeth J. McRae Mary Jane McLean, Eliza Jane Pell, Camilla F Rogers, Flora A Smith, Martha E. Shepherd, Sarah M. Vilas; William T. Wallace; Hariett Wood.

2nd Class Elementary (*E*)—Melinda Burbank, Eleonor Cameron, Mary A. Cutter, Hester P. Ingalls, Sarah A. McElroy, Agnes M. Smith, Mary A Smith, Lucy E. Vilas, Lucinda Wing; (*F.*)—Philomene Casgrain.

May 1, 1866.

Wm. Gibson,
Secretary.

—

BOARD OF EXAMINERS OF PONTIAC.

2nd Class Elementary (*E*)—Alexander R McDonald, Augustus Prime, Mary Jane McKnight, Mary Elizabeth Poupore

February 6, 1866.

Ovide Leblanc,
Secretary.

—

OTTAWA BOARD OF EXAMINERS.

1st Class Elementary (*E*)—Mary Burke, Maria Grant, Emily Kindall, Bridget Kerr, Elizabeth Kerr.

1st Class Elementary (*F*)—Jenny Jamieson, Louise Anne Papineau

2nd Class Elementary (*E*)—Catherine Burke, Jennet McCallum, Annie M. Tweedie.

May 1, 1866.

John R. Woods,
Secretary.

—

RICHMOND BOARD OF EXAMINERS.

1st Class Elementary (*F*)—Marie Pulchérie Blanchet, Vitaline Bouthillette, Marie Lucie Cormier, Marie Aglaé Blachette, and Marguerite Gagnon.

2nd Class Elementary (*F.*)—Célina Godbout · (*E*)—Alexander McKinnon and Henry Waters.

May 1, 1866.

2nd Class Elementary (*F.*)—Lévanie Vincent and Melissa Pothier.

February 6, 1866.

J. H. Graham,
Secretary.

—

SHERBROOKE BOARD OF EXAMINERS.

1st Class Elementary (*E*)—Abbie Brown, Susan Gordon, Sarah Gordon, Phœbe Mallory, Augusta True.

2nd Class Elementary (*E*)—Jane Barnard and Janet Hepburn.

May 1, 1866.

S. A. Hurd,
Secretary.

—

STANSTEAD BOARD OF EXAMINERS.

1st Class Elementary (*E.*)—Clara A. Gaylord, Helen M. Field, L. Agnes North, Charlotte E. McAllister, Betsey Abbott, Sarah Lacey, Luvia McCoy, Mary E. Baldwin, Mary C. Tinker, Agnes N. Cleveland, Ada E. Young, Victoria E. Foss, Clara Baldwin.

2nd Class Elementary (*E.*)—Elizabeth Slater.

May 1, 1866.

C. A. Richardson,
Secretary.

—

SITUATIONS WANTED.

An experienced Teacher, who holds a first class diploma, is desirous of an appointment to conduct a school in Montreal or its vicinity. Apply at 239 Aqueduct Street, Montreal.

—

JOURNAL OF EDUCATION.

MONTREAL (LOWER CANADA), MAY, 1866.

McGill University Convocation.

CONVOCATION.

The annual Convocation was opened yesterday.

The Chancellor, the Hon. C. D. Day, LL. D., president, donning for the first time this Chancellor's gown, &c.

On the dais near him were also present—

The Vice-Chancellor and Principal of McGill College—Dr Dawson.

GOVERNORS—The Hon. James Ferrier, Mr Dunkin, M. P. P., Mr Roberston, Q. C., Mr W Molson, the Hon John Rose, M. P. P.

FELLOWS—The Vice-Principal and Dean of the Faculty of Arts of McGill College (Rev Dr Leach), G W Campbell, M. D., Dean of the Faculty of Medicine; H A Howe, M A, Rector of the High School; Rev Dr Cook, Principal of Morrin College: B Chamberlin, M A B C L; R. A. Leach, M A B C L: (Convocation Fellows) Professor Cornish, Professor Johnson, Professor Hatch.

PROFESSORS—De Sola, Scott, Howard, Darey, of McGill; The Rev Dr Wilks, of the Congregational College.

The Secretary and Bursar, Mr Baynes.

GRADUATES—Ed H Trenholme, MD, Rev Canon Bancroft, M A; Rev Edwin Gould, M A; Jas Kirby, M A. B C L; David Leach, M A, B C L; C P Davidson, B A, B C L; L H Davidson, B A, B C L; C H Kirby, CE; J H Bothwell B A; Rev J Davidson, B A; Wm Fowler, B A; Lonsdale Green, B A; E E Krans, B A; James McGregor, B A, and R A Ramsay, B A.

The proceedings were opened with prayer by the Reverend the Vice-Principal of McGill College.

The Minutes of the first day of last Convocation were read.

Convocation then proceeded to elect the Fellows in each of the Faculties as follows:—

IN ARTS—B Chamberlin, M A, B C L; and R A Leach, M A, BCL.

IN MEDICINE—W Sutherland, M D, and R Godfrey, MD.

IN LAW—W B Lambe, BCL; and F W Torrance, B C L.

The Dean of the Faculty of Arts in McGill College then read the Honour and Class List in that Faculty of the College, as follows:—

FACULTY OF ARTS.

HONOURS, PRIZES AND STANDING.

Graduating Class.

B A Honours in Classics— Anderson, Jacob DeWitt: 1st Rank Honours in Classics: Chapman Gold Medal. Watts, William John: 1st Rank Honours in Classics.

B A Honours in Natural Science—Bethune, Meredith Blenkarne: 1st Rank Honours in Natural Science and Logan Gold Medal. Tabb, Silas Everett: 1st Rank Honours in Natural Science. Perrigo, James: 1st Rank Honours in Natural Science.

B A Honours in English Literature—Browne, Arthur Adderley; 1st Rank Honours in English Literature and Shakespeare Gold Medal. Wilson, John: 1st Rank Honours in English Literature.

B A Ordinary—Class I: Grandy, John. Class II: Chipman, Clarence; McLeod, Hugh; Hart, Lewis A; Morrison, John. Class III: Beckett, William Henry.

Bancroft, Charles (Egrotabat): Macduff, Alexander Ramsay, (Egrotabat).

Chipman (Prize in German.)

Third Year.

Archibald—1st Rank General Standing; Prize in Mental and Moral Philosophy.

Fraser—2nd Rank General Standing; Prize in Zoology.

Holiday—Prize in French.

Brown, Charles—Prize for a collection of Plants.

Passed the Sessional Examination—Archibald, Frazer, Holiday, Carmichael.

Second Year.

Brooks—1st Rank General Standing; Certificate in Classics; Prize in Botany.

Mabler—1st Rank General Standing; 1st Rank Honours in Mathematics and Prize; Certificate in Classics; Prize in French.

Laing—1st Rank General Standing; 1st Rank Honours in Mathematics and Prize; Prize in Logic; 2nd Prize in Hebrew.

Dart—Prize in Chaldee.

Passed the Sessional Examination—Brooks, Mahler, Laing, Dart and Slack equal, Moore, Kennedy.

First Year.

Davies—1st Rank General Standing; Prize in Classics; Prize in Logic.

Cruickshank—1st Rank General Standing; Prize in English; Prize in History.

Lewis, Montgomery—Prize in Chemistry.

Kahler, Frederic—Prize in Hebrew.

Passed the Sessional Examination—Davies, Cruickshank, Mackenzie, Greenshields, Lewis (Montgomery) Harrington, Lewis, (Albert), Kahler (Frederic), McLean (John) Jones, Clarke, Vennor, McRae.

The Medallists.—Mr Anderson, Mr Bethune and Mr Browne were called forward, and received their medals from the Chancellor.

The Diplomas of Honours were then handed to the Honour men by the Dean of Faculty.

Messrs Anderson, Watts, Bethune, Tabb, Perrigo, Browne, Wilson, Grandy, Chipman, McLeod, Hart, Morrison, and Beckett were called forward, and, having made the requisite declaration, received the degree of Bachelors of Arts.

Messrs Bancroft and Macduff were also admitted to the degree.

Mr McLeod then delivered the Valedictory on behalf of his class.

Prof. Hatch, Dean of the Faculty of Arts, Morrin College, then read the following list of those who had passed to the degree of B. A. with Honours:—

Mental and Moral Philosophy—First rank—Messrs Scott and Wotherspoon equal, Mr Cassels, Second Rank—Mr N. W. McLean; Mr Theophilus H. Oliver.

These gentlemen then received the degree of B. A.; after which Mr Wotherspoon read a valedictory on behalf of his fellow-graduates from Morrin.

The following Bachelors of Art were then announced by the Dean of Faculty of Arts, McGill, to have complied with the regulations, and to be entitled to the degree of M. A., viz.: The Rev. James Davidson, and Messrs George Ross and R. G. Wicksteed, and those gentlemen having made the necessary declaration, were admitted to the degree.

THE DEAN OF THE FACULTY OF ARTS (the Ven. Archdeacon Leach), then addressed the Graduates.

He remarked upon the fact that the present convocation was one deserving more than usual notice, on this account, that they had a larger number of Graduates than ever before. And he was glad especially to notice this, inasmuch as it was an indication of a growing taste for and appreciation of Academical learning in the community. He desired to recognize the good work in the same direction done by other collegiate institutions in Lower Canada, not only those affiliated with the University, but Bishop's College, Lennoxville, as well, which he regretted was not also affiliated. They recognized the work these had done, as assisting themselves and the cause of University education generally. It was urged sometimes that the learned professions are too crowded, but he argued against this as a fallacy—at least the learning which fitted them for the pratice of those learned professions was a benefit to the recipients themselves, and to those with whom they were brought in contact. One thing he thought noteworthy and to be regretted, that so few even of those who came to receive a University education seemed to have developed their literary tastes —to have properly cultivated their fancy and sensibility. Perchance this was owing to the purely practical tastes of parents in this new country, busied with the getting of a living. But he thought it was a pity that youth were not taught to appreciate the beauties of Milton and Shakspeare—nay, that children were not encouraged to learn parts of Tennyson as well as hymns. He next addressed the Graduates in a few happy words of advice, and concluded with a compliment to Principal Dawson, who, more than any other person, had since he came among us urged forward by his untiring exertions the cause of academic education.

[We have given a very brief outline of a very admirable address.]

The REV. DR. COOK, Principal of Morrin College, next addressed the Convocation. He had been long connected with McGill University. Not long after he came to this country he was named one of the Board of the Royal Institution for the Advancement of Learning, and continued to act thereafter upon it with the late Bishop of Quebec and others—most of whom had passed away. When the Board was reorganized, and properly made up of men resident in Montreal, he of course ceased to be upon it, but his interest in the Institution had not ceased and when Morrin College was recently affiliated he was glad of the opportunity to renew his connection. And he should be lacking in courtesy if he did not take that opportunity to recognize the promptitude and kindness with which Principal Dawson and the Chancellor had acted in the negociations for this affiliation, how they had exerted themselves to remove all difficulties in the way. He heartily concurred also in what Dr. Leach had said with regard to the labours and merit of the learned Principal of McGill—the Vice-Chancellor of the University. Of Morrin College he would not say much. It had no very large resources, and the English population near it was so small that they could not expect for many years to come to have many students. It was well to do heartily at once what they could do, to have higher aims, to look forward to a still higher standard of education in the future, especially more support both from public and private benevolence. What the friends of the cause had most to dread was the apathy of the general public and the desire manifested by rich men to take their sons at the earliest pratical moment from their teachers and place them in their country houses. There is excuse for the poor perhaps that they should set their children to earn their livelihood at the earliest moment—but none for the rich—of whom their must be many in a great town like Montreal, where one saw on every hand signs of great wealth and abounding prosperity. They had it on the highest authority that a man's life does not consist in the abundance of that which he possesses. Next after high principle and upright conduct, intellectual culture should be prize before all else. Nothing was so calculated as such culture to prevent men from giving way to low tastes, ofttimes bred of indolence of vacuity of mind. The citizens of Montreal had been generous in their donations to the University; but the best aid they could give it would be to send their sons here and so increase the numbers of those having an interest in University education. The rev. Doctor concluded with some advice to the undergraduates about the method of spending their holidays.

The VICE CHANCELLOR then announced that the Corporation had conferred the honorary degree of LL. D. upon H. H. Miles, Esq., M. A., Professor of Mathematics and Natural Philosophy at Bishop's College, Lennoxville. Professor Miles had for many years taught with eminent ability in that institution, his connection with which, he regretted to hear, was about to cease. This University desired in this way to recognize his long and faithful labors in the cause of education in Lower Canada.

The Corporation had also conferred the honorary degree of M. A. upon Mr Daniel Wilkie of Quebec, Senior Master in the High School there, and Secretary to Morrin College. He also had been long engaged in promoting the cause of the higher grade of education in Lower Canada. And he might remark here that the University felt it its duty to be more and more chary of conferring its honorary degrees, more especially this of M. A. It was not impossible that it would hase to be done in this latter case. But there had been circumstances attendant upon our condition in Canada, just emerging as it were from a rudimental condition in respect of academic education, which seemed to call upon the University to recognize in some such way the preliminary or preparatory work done by educators in the midst of many discouragements. For these reasons, as well as for the ascertained merit and learning of the recipients, these degrees had been conferred.

He congratulated the friends of the University on the large numbers of graduates in Arts this year. It was the largest they ever yet had, and they were not, for special reasons, likely to have for two years to come so many again. After that he hoped to see the numbers again reached and maintained, if not surpassed. And he was glad to say that the men sent out this year, were in all respects such as the Professors could wish them. They were to be congratulated not on their numbers alone but on their attainments. They were glad to welcome the first graduates from Morrin College. They hoped they would annually have a like pleasure: and he also hoped that next year another affiliated College, St. Francis, would send up men for the intermediate examination. One of the most distinguished of the McGill graduates had been named Professor of Mathematics there, and they had also secured a competent teacher of the Natural Sciences. He had felt very much moved and gratified by the kind and unexpected compliments paid him by the Rev. Vice Principal and Rev. Dr. Cook. To him it was a pleasure to have work with men so true and earnest as those with whom he had been associated. When he looked back upon the work they had accomplished, it seemed, notwithstanding several failures and drawbacks, a great one. And to such a work he would cheerfully devote the remainder of his life as he had given the last ten years. It should be the hope and ambition of all of them to make this continue in the future, as he believed it to be now, the greatest University of British America. (Applause.)

The proceedings of convocation were then closed with the benediction pronounced by the Rev. Professor Cornish, and formally adjourned till to-day at three o'clock p.m.

SECOND DAY.

The proceedings of Convocation were continued yesterday, the Chancellor again presiding. There were present also:

GOVERNORS.—The Hon. James Ferrier; A Robertson, Q. C.; Mr Dunkin, M. P. P : Hon. John Rose, Q. C., M. P. P.; The Vice-Chancellor (Principal Dawson.)

FELLOWS.—The Vice-Principal and Dean of the Faculty of Arts; the Rector of the High School; the Dean of the Faculty of Law; the Dean of the Faculty of Medicine; B. Chamberlin, M. A. B. C. L.; R. A. Leach, M. A., B. C. L.

PROFESSORS.— Hall, Fraser, Scott, Wright, Howard, McCallum; Craik and Fenwick of the Faculty of Medicine; Torrance, Lafrenaye and Laflamme of the Faculty of Law; Smallwood, Markgraf, Johnson, Cornish and Darey of the Faculty of Arts.

MEMBERS—W. H. Hingston, M. D.; F. W. Campbell, M. D.; E. A. Trenholme, M. D.; D. S. Leach, B. C. L.; C. P. Davidson, B. C. L.; N. W. Trenholme, B. C. L.; G. Doutre, B. C, L.; E. Krans, B. A.; A. R. McDuff. B. A.; Beckett, B. A.; Tabbe, B. A.

Hon. E. Hale, Chancellor of Bishop's College, Lennoxville, was also present.

The proceedings were opened with prayer by the Reverend the Vice-Principal.

The minutes of the last year's Convocation were then read by W. C. Baynes, Secretary.

The Dean of the Faculty of Medicine (Dr. Campbell) then read the prize list of that Faculty as follows:—

The total number of students in the past session has been 178.

From Canada East	93
Canada West	72
New Brunswick	3
Prince Edward Island	2
Nova Scotia	3
Newfoundland	1
United States	4

The number of students who have passed their primary examination for the MD. CM degree, which includes Anatomy, Chemistry, Materia Medica, Institutes of Medicine, and Botany or Zoology is 39, as follows:

John R Smallwood, Montreal, CE; Emery Allard, Belœil, CE; Albert Roy, St. Hyacinthe, CE; James O'Leary, Kamouraska, CE; George Dickinson, Ottawa, CW; Richard King, Peterborough, CW; Richard S Markell, Osnabruck, CW; Clinton Wayne Kelly, Kentucky, US; Wm McCarthy, Henryville, CE; James Howard, St. Andrew, CE; John M Wanless, Montreal, CE; Peter A McIntyre, Charlottetown, PEI; Wm H Fraser, Perth, CE: Edward K Patton, Quebec, CE; Robert L McCarthur, Martintown, CW; Francis L Holland, Arcona, CW; Daniel M Cassidy, Montreal, Donald McDiarmid, Newington, CW; John Vicat, Montreal, Canada East; Lafontaine B Powers, Port Hope. CW; John S Proudfoot, Chatsworth, CW; Henry McGowan, Kingsey, CE; Edward J C Roberts, Fredericton, NB; Wm B Malloch, Ottawa, CW; Clarence R Church, Merrickville, CW; James W Oliver, St. Catharines, CW; John A S Macdonald, Charlottetown, PEI; John Brandon, Warwick, CW; Wm Grant, Williamston, CW; Charles C'Relley, Hamilton, CW; Edmund Paradis, St. Denis, CE; John Gillies, Morristown, CW; James A Nesbitt,, Hemmingford, CE; John Madill, W Essex, CW; W Dongan, St Catharines. CW; Arcd MacLean, Port Sarnia, CW; John Bell, MA, Kingston, CW; Hy Harkin, Montreal, C E; Calixte Ethier, St Joseph, C W.

The following are the names of students presented for the degree of MD, CM, their residences and the subjects of their thesis:

Geo Ross, MA, Montreal, CE, Asiatic Cholera; Samuel Campbell, Glengarry, CW, Pneumonia; Alexander Falkner, Lancaster, CW, Croup; Edmund C Walsh, Montreal, CE, Excision of Joints; Edmund Longley, Waterloo, CE, Arterial Hemorrhage; William Fuller, London, CW, Nutrition; John McCurdy, Chatham, N B, Fatty Degeneration; Thomas D Laney, Owen Sound, CW, Pleuritis; James A Knowles, Cookstown, CW, Some of the causes of Disease; John Corsan, Milwaukee, US, Evils of Tight Lacing; Julius Leavitt, Melbourne, CE, Function of Plants; Charles E Hickey, Williamsburgh, CW, Carcinoma; James B Hall, Montreal CE, Asiatic Cholera; Rufus S Parker, Newport, Nova Scotia, Stricture of Urethra; Alexander R Ferguson, Williamstown, CW, Hydrophobia; Alexander Anderson, Georgina, CW, Scofulous, Ophthalmia; Chas H Cooke Mount Pleasant, CW, Chloroform; Wm Wakeham, Quebec, CE, Treatment of Mania; Alex C Savage, Ottawa, CW, Typhus Fever; James Hayes, Simcoe, CW, Anesthetics; Philip Burrows, Ottawa, CW, Pneumonia;

Ben F Burch, Fort Coddington, US, Dyspepsia; Emery Allard, Belœil, CE, Cholera; John Bell, M. A., Kingston; CW, Acute Rhumatism; James O'Leary, Kamouraska, CE, Hysteria; Jonas J G Hervey, Brockville, CW, Tetanus; James C Irvine, Montreal, CE, Peritonitis; Chas S Parke, Quebec, CE, Pneumonia; George Duncan, Montreal, CE, Abortion; Thomas Gendron, Beauport, CE, Hernia; Ben S Wilson, Roslin, CW, Typhoid Fever; John Adsetts, Assit. Surg. R. Artillery, Quebec, Delirium Tremens; Jas T Halliday, Vernonville, CW, Circulation of Blood; Charles E Graham, Ottawa, CW, Acute Rheumatism.

The following gentlemen passed their examination, but are not of age. Their degrees will be conferred next meeting of Convocation:

William Gardner, Beauharnois, CE, Valvular Heart Disease; Patrick Robertson, St Andrew, CE, Scarlet Fever; David M Cassidy, Montreal.

The Medical Faculty prizes consist, first, of the Holmes' Gold Medal, founded by the Faculty in honour of their late Dean, and two prizes in Books, for the best primary, and best final graduation examinations.

2. The Holmes' Gold Medal is awarded to the student who, being of the graduating class, and having passed the Final Examinations, shall have prepared a Thesis of sufficient merit in the estimation of the Faculty to entitle him to compete, and shall take the highest marks in a special examination for the Medal.

George Ross, M. A., Montreal, was the succesful competitor for the Medal.

William Gardner, Beauharnois, C E, gained the Prizes for the best examination in the final branches, and Clinton Wayne Kelly, Kentucky, U. S., for the best Examination in the Primary branches.

Professor's Prize in Clinical Medicine, John McCurdy.

Prize in Natural History, Botany—O H Clarke, and A A Henderson.

PRACTICAL ANATOMY DEMONSTRATOR'S PRIZES.

Senior Class—For general excellence as a practical anatomist and for punctuality of attendance, prize awarded to Mr A E Spohn. Students who deserve honorable mention as good pratical anatomists—Messrs W H Fraser, C W Kelly, L B Powers,—Roddick, and J Quarry.

Junior Class—The prize is divided between Messrs Octavius H E Clarke and Thomas J Alloway. Both of these gentlemen deserve credit for their care and painstaking in this department of their studies. Students of the first year, who deserve mention for deligence and attention, are Messrs G J Bull, A L Wilson, F D Lucas, and C J Hamilton.

Students who have passed the examinations in Natural History:

BOTANY.

Class 1st—O H E Clarke, A A Henderson, G F Bull, W H Howitt, F J Tuck, W Cherry, and A E Spohn.

Class 2nd—A Renfret, F A L M'Nab, T J Alloway, W M'Farlane, W P Buckle, J Campbell, T Wilson, J Pridham, C J Renfret, R A D King, and J M'Fie.

Class 3rd—A Harkness, F Hall, T Archer, J A Whyte, A Garneau, A Gillatly, D D M'Bain, C Dansereau, J H Wye, T de Grosbois, D Fraser, J Stinson, J Stewart, A L Wilson, W Cruise, R Spencer, A Tanguay, and A V Clement.

ZOOLOGY.

Class 2nd—T A Rodger.

Mr Ross was then called forward, and received the Holmes' Gold Medal, the Chancellor expressing a hope that he might prove as good a man and as devoted to science and the duties of his profession as the late Dean of Faculty, whose name the medal bore.

Dr. Ross, we may also mention, was Chapman Medallist of the year in which he graduated in the Faculty of Arts.

The Dean of Faculty then delivered the prizes to the prize-men.

The graduates were then called up, and having made the required declaration, received formally the degree of M.D. C.M.

Dr. HICKEY then delivered the valedictory on behalf of the new graduates.

Professor FRASER then delivered a very excellent parting address on behalf of the Faculty to the new graduates. Adverting to the prospects before them, he told them that the medical profession neither offered to those who pursued it the great gains of commerce or the distinction won at the bar, or in the army, but it did afford the means of most extensive usefulness, of largely benefitting their fellow-men. To that end he urged on them the duty of preserving their own health and cultivating their minds. He specially dwelt on the evil effects of indulgence in alcoholic stimulants as robbing a man of his usefulness in his profession. He advised all those whose means permitted to go to the great medical schools of Europe ere settling down to practice. He pointed out the need to keep pace with the progress of science. He urged upon them the need of strict integrity, with reticence and patience in dealing with the sick, of the rule of doing to others as you would wish to be done by in dealing with their brethren in the profession: and finally, as their chief public duty, the promotion of sanitary reforms; pointing out how much might be done for their fellow-men in this direction.

THE DEAN OF THE FACULTY OF LAW (Prof. Abbott) then read the list of prizes and of graduates in that Faculty, as follows:—

LIST OF GRADUATES

John Alexander Bothwell, of Durham, C E; Christopher Benfield Carter, of Montreal; Henri Jules Tachereau Duchesnay, of Ste Marie la Beauce, C E; Pierre Nagel Duprat, of St Henri de Mascouche, C E; William Owen Farmer, of Montreal; Christophe Alphonse Geoffrion, of Vercheres, C E; Robert Edwin Ruthven Johnson, of Waterloo, C E; Robert Anstruther Ramsay, of Montreal; Emery Robidoux, of St Phillippe, C E; William Rose, of Montreal.

RANKING OF STUDENTS AS TO GENERAL PROFICIENCY.

Third Year.

1st, John Alexander Bothwell, 1st in all classes; Christopher Alphonse Geoffrion, 2nd in four classes;

Second Year.

1st, Asa Gordon, 1st in three classes and 2nd in one; 2nd, John Rice McLaurin, 1st in two classes.

First Year.

1st, James Robertson Gibb, 1st in two classes and 2nd in one; 2nd John James MacLarens, 1st in one class and 2nd in one class.

STANDING OF STUDENTS IN THE RESPECTIVE CLASSES.

Third Year.

Commercial Law.

Prof Abbott: 1st, John Alexander Bothwell; 2nd, Christopher Benfield Carter.

Civil Law.

Prof Torrance: 1st, John Alexander Bothwell; 2nd, Christophe Alphonse Geoffrion.

Jurisprudence.

Prof La Frenaye; 1st, John Alexander Bothwell; 2nd, Christophe Alphonse Geoffrion and Christopher Benfield Carter, equal.

Customary Law and Law of Real Estate.

Prof Laflamme: 1st, John Alexander Bothwell; 2nd Christophe Alphonse Geoffrion and Emery Robidoux, equal.

Criminal Law.

Prof Carter: John Alexander Bothwell; 2nd Christophe Alphonse Geoffrion.

Second Year.

Prof Abbott: 1st, John Rice MacLaurin; 2nd, Asa Gordon.

Prof Torrance: 1st, Asa Gordon, John Rice MacLaurin, equal; 2nd, Alexander Edward Mitchell.

Prof La Frenaye: 1st, Asa Gordon; 2nd, Geo Robert William Kittson, William Dominick Drummond, equal.

Prof Laflamme: 1st, Asa Gordon; 2nd, Alexander Edward Mitchell.

First Year.

Prof Abbott: 1st, James Robertson Gibb; 2nd, John James MacLaren.

Prof Torrance: 1st, John James MacLaren; 2nd, James Robertson Gibb.

Prof La Frenaye: 1st, William Warren Lynch; 2nd, John James MacLaren.

Prof Laflamme: 1st, James Robertson Gibb; 2nd, John James MacLaren.

Mr Bothwell was then called forward, and Professor Abbott proceeded to compliment him upon the fact that having been Logan medallist in the Faculty of Arts he now carried off the highest prize—the Elizabeth Torrance Medal—(founded by John Torrance, Esq.), in the Faculty of Law. He regretted the Medal had not arrived, and that, therefore, Mr Bothwell could not on that occasion receive it from the hands of the Chancellor. He felt called on, therefore, thus publicly to compliment him on having won it. And be would add this also, that the future career of one who had won so much distinction in the University would be watched hereafter with no ordinary interest by his late teachers and others.

The Graduates being then called forward, made the required declaration, and the degree of Bachelor of Civil Law was formally conferred upon them.

Mr. Geoffrion then delivered the valedictory on behalf of the graduates, and Professor Lafiamme the parting address on behalf of the Faculty.

THE VICE-CHANCELLOR then briefly addressed the Convocation, alluding with gratification to the fact that the number of students in the past year had been larger than ever before, viz. 314, or with those of the affiliated colleges, 350. The number of graduates also was larger, being this year 66. And it was gratifying to know that the largest per centage of increase was in the Faculty of Arts. Another noteworthy feature in the results of this year's work was, that out of 7 honour men, 6 were sent up by the High School. Heretofore the students from the country districts had often won the greater number of places. Again, out of five medals this year four had been carried off by High School boys; and the medals in the two professional faculties had been won by men who had graduated with honours in Arts, taking medals in that faculty also. Here was another proof of the advantage of the more thorough preparatory studies of the college, even in competition for professional eminence. The Vice-Chancellor next alluded to the fact that at last, after fifteen years of anxious labor, the Governors had utilized and rendered productive all the estate bequeathed by the late Hon. James McGill for its foundation, except what was absolutely needed for the college itself. Their administration of that estate was proof to all who might be willing to intrust them with further funds, that they would also be well used. There was much more needed, either from private beneficence or public means; and a public man could in no way earn more enviable distinction than by using his influence to wipe off the reproach that the government and Parliament of the Province had given nothing for the endowment of academical institutions in Lower Canada. He concluded with an eloquent appeal to the graduates and students respecting the development of their minds beyond the comparatively narrow range of studies they had hitherto pursued.

The proceedings were closed with the benediction, pronounced by the Rev Professor Cornish, and the Convention adjourned *sine die.*

McGill University Society.—Yesterday the annual election of officers of this Society took place at the William Molson Hall, which resulted as follows:—

President; B. Chamberlin, M. A., B. C. L.,
1st Vice President: R. A. Leach, M. A., B. C. L.
2nd Vice President: E. H. Trenholme, M. D., B. C. L.
Secretary and Treasurer: C. P. Davidson, B. A., B. C. L.
Members of Council: W. W. Squire, M. A., M. D.; J. H. Bothwell, B. A., B. C. L., and N. Trenholme, B. A., B. C. L.

Twenty-seventh Meeting of the Teachers' Association in connection with the Laval Normal School.

This Convention was held on the 26th and 27th January last.

Present:—Rev. Principal Langevin, Messrs. J. B. Cloutier, President; E. Saint-Hilaire, Secretary; F. X. Toussaint, N. Lacasse, N. Thibault, D. McSweeney, J. B. Dugal, L. Roy, and the teacher-pupils of the Normal school.

The minutes of the last meeting having been read and adopted, Mr. E. Saint-Hilaire read an essay on the qualities of the teacher; after which the Principal made several interesting experiments.

The meeting was then adjourned to the following day at 9.30 A. M.

SECOND SITTING.

Present:—Rev. Principal J. Langevin, Inspector Juneau, Messrs. J. B. Cloutier, E. Saint-Hilaire, Ed. Carrier, F. X. Toussaint, N. Lacasse, N. Thibault, D. McSweeney, Jos. Létourneau, J. B. Dugal, A. Emond, Ls. Roy, P. Paradis, C. Gauvin, H. Declercq, G. Tremblay, J. Gagné, F. Morisset, P. A. Roy, A. Paradis, D. Pichet, and the teacher-pupils of the Normal school.

The association unanimously approved of the accounts given in by Mr. E. Gauvin, treasurer for last year, and also of the following resolution adopted by the Committee of Management at its morning session.

Moved by Mr. Ed. Carrier, seconded by Mr. E. Saint-Hilaire, and *Resolved,*—That as many of the members neglected to pay their annual contributions, the names of those who were in arrear be struck off the list of members of this association at the next meeting, if they fail to pay before that time the full amount due.

The President then briefly stated the conditions required to become a member of the association and the privileges enjoyed by those belonging to it; after which four new members gave in their names.

Professor Toussaint announced that he had published a treatise on arithmetic, which he hoped might prove useful to teachers and youth.

The President said that he had perused Mr. Toussaint's arithmetic attentively and could recommend it to teachers, as he believed it would be very serviceable to them. This treatise, he added, contained decimal calculations in dollars and cents, which were treated of with care, and also concise methods not to be found in any other work in the French language.

The Rev. Principal said that he had written a letter to Mr. Toussaint congratulating him for having supplied the teachers with so useful a text-book; that having revised the proof-sheets, he could safely approve of the method followed by the author, and did not hesitate to recommend the work to all those who took an interest in teaching.

The President then informed the meeting that a treatise on mental arithmetic by Mr. Juneau, Inspector of Schools, was in the press and would soon be offered for sale; that a work of this kind could not fail to meet a most favorable reception on the part of the teachers.

Professor N. Lacasse expressed the opinion that this work, which he had read with attention, would be very useful in the schools, and therefore deserved the support of teachers. He then announced that, in accordance with the desire previously expressed, he had prepared a text-book entitled, "*Tenue des Livres en Partie simple et en Partie double,*" which he trusted would be found to combine the advantages of the theory and practice of book-keeping, and hoped that it would be favorably received by teachers. It would, he said, be ready for sale in the month of May.

The Principal congratulated Mr. Lacasse for having filled up a blank by publishing a treatise on book-keeping adapted to the use of the country. For a long time the want of such a work had been felt. They had, he said, always labored under the false impression that accounts could not be kept in French, but this work would help greatly to make this grave error disappear.

The President then called the teachers' attention to the abridged French Grammar just published by Mr. C. J. L. Lafrance, and said that he had not had time to make a detailed examination of it, and consequently could not justly appreciate its merits, but hoped Mr. Thibault would be kind enough to do so.

Mr. Thibault said that he was happy to take this opportunity to recommend to the teachers, the abridged French Grammar published by Mr. C. J. L. Lafrance. Good elementary French Grammars were rare. To have one suited to children recourse must be had to L'homond's: but this author's system was incomplete and his work contained many inaccuracies. Mr. Lafrance's grammar was remarkable for its clearness and excellent method, and could replace Lhomond's in our schools with advantage. While it had all the merit of Lhomond's, it had none of its defects.

The Principal approved Mr. Lafrance for having retained in his grammar a part of Lhomond's definitions, which were, he said, remarkable for their extreme simplicity; and also approved of the tabular forms adopted, as being within easy reach of children. He then congratulated Mr. Juneau for having undertaken a work on mental arithmetic. The English, he added, were in advance of them in this respect. It was very desirable to have text-books in the French language to facilitate the study of so useful a branch of knowledge as that referred to.

After some further remarks on the above mentioned books, Mr. N. Thibault addressed the convention on the progress of French literature in Canada.

The following subject was then proposed for discussion: "What is the best method of teaching the rules of interest?" The President opened the debate by saying that all problems in Interest could be solved by the *Rule of Three,* and to prove the truth of his assertion gave several examples on the blackboard. Some remarks were made on the subject by the Rev. Principal and Messrs. F. X. Toussaint and D. McSweeney. The discussion was carried on with animation and lasted till the afternoon. As no definite conclusion could be arrived at, it was resolved to put off the question till the next meeting.

On a motion by Mr. N. Thibault, seconded by Mr. N. Lacasse, it was resolved: 1, That the abridged French Grammar by Mr. C. J. L. Lafrance, and the treatise on arithmetic by Mr. F. X. Toussaint, were text-books much wanted and destined, by their intrinsic worth, to be of great service to teachers; 2, That all the members of this association should make it a duty to encourage their circulation; 3, That the thanks of this association be returned to Messrs. Lafrance and Toussaint for the publication of their text-books.

Moved by Mr. P. A. Roy, seconded by Mr. D. Pichet, and *Resolved,*—That this association has heard with much regret of the death of Mr. François Ferland, one of its members, a young man of promise.

Messrs. F. X. Toussaint, N. Thibault and Ed. Carrier promised to prepare papers for the next convention, the first named on *Mental Arithmetic.* The following subject will be discussed: *On what part of Mental Arithmetic is it most necessary to insist in our schools?*

The meeting then adjourned to the last Friday in May at 7 P. M.

Notices of Books and Recent Publications.

FAILLON.—*Histoire de la Colonie Française en Canada. Tome 3e, Ville-Marie, Bibliothèque Paroissiale*, 1866. 4to, xxiii-548 pp. and 6 maps. Paris, Poupart-Davyl, Printers.

In the volume under notice, the third issued so far, the author brings his historical narrative down to the year 1672 only. Besides the six maps properly belonging to this volume, it contains two others which are to be placed in the first volume as having reference to it. One of these is a copy of a map by Lescarbot, showing the outlines of the Island of Newfoundland, the River St. Lawrence, and that part of the Atlantic coast lying within the limits of New France The other is a map of the *Saut St. Louis* and a portion of the Island of Montreal, by Champlain.

" MARTIN BOSSANGE: 1765-1865."—Jouast, Paris; 1866.—12mo, 46 pp.

M. Martin Bossange, a prominent French publisher, was born at Bordeaux in the month of February, 1766. Having opened an establishment in Paris in 1785, he soon extended his business to the provinces of the kingdom and was among the first of those who succeeded in disseminating the productions of French literature over the greater part of the world. His name, says a contemporary, is known wherever there is a library. Though of a very delicate constitution, he lived to the advanced age of a hundred years all but six weeks. The anniversary of his centennial birthday was to have been celebrated on the 1st December, 1865, at the Hotel du Louvre, at the request and expense of M. Emile Pereire (Banker), but he did not live to enjoy the splendid *fete* prepared for him. A few weeks before his death the knighthood of the Legion of Honor was conferred on him. The above mentioned pamphlet contains a fine portrait of the deceased.

FIGUIER.—*L'Année Scientifique et Industrielle.* Ninth Year. By Louis Figuier. Paris, Hachette. 572 pp. Price 3 fr. 50 c.

BAGG.—The Antiquities and Legends of Durham. By Stanley Clark Bagg. Montreal; 1866.—8vo, 21 pp.

A lecture by Mr. Bagg, President of the Numismatic Society of Montreal. We thank the author for sending us a copy of this interesting pamphlet.

LA GAZETTE MÉDICALE. (Montreal).—The numbers of this periodical for March and April contain, among other articles, a lecture on Cholera, by Dr. Rottot..

L'ECHO DE LA FRANCE. (Montreal).—This periodical has reached its second volume, and is published fortnightly instead of weekly as heretofore; it however, still contains the same quantity of matter per month By this improvement, due to Mr. Ricard, the Editor, the articles reproduced will not have to be so much subdivided as was necessarily the case when printed in the shorter serials. The selections made are excellent thus far, and we learn with pleasure that this publication has already numerous subscribers.

TOUSSAINT —*Traité élémentaire d'Arithmétique, par F. X. Toussaint, professeur de mathematiques à l'Ecole Normale Laval. Côté et Cie.*, Quebec; 1866.—12mo, 150 pp.

This treatise on arithmetic, which is intended for elementary and model schools, is an abridgment of the larger text-book published by Mr. Toussaint some time ago and noticed in this journal. A table of moneys, weights and measures has been added. We believe it is the intention of the author to submit the work for the approval of the Council of Public Instruction.

LE FOYER CANADIEN. (Quebec).—Among the articles given in the number for April will be found an excellent biography of the late Mr. Garneau by Abbé Casgrain, revised and considerably enlarged. It is accompanied with a photograph, a contribution due to the liberality of Mde. Livernois, and contains also an autograph of the Historian's.

MICHEL AND HUNT —Reports of Mr. A. Michel and Dr. T. Sterry Hunt on the Gold Region of Canada. Hunter, Rose & Co., Ottawa; 1866.—8vo, 28 pp.

Aca nada means " there is nothing here," and in the mouth of the Spaniard of the fifteenth and sixteenth centuries, meant *there is no gold here* This is the etymology which many writers have given of the name of our country. But it is now well known that the word *Canada* is derived from *Kannata*, which in the Iroquois tongue signifies *huts*, or in its widest sense, the ground on which a number of huts stand—a village. The discoveries made during the last few years have proved the Spanish etymology to be doubly erroneous. If the first geological reports have not said that there was no gold in Canada, they gave us to understand that if any existed, it was very scarce. The general report for the year 1863, however, says that before long the auriferous alluvions so widely diffused in Canada would be turned to account. We are now convinced that considerable gold deposits exist in the region lying south of the St. Lawrence.

The following are extracts from Mr. Michel's report; the statements therein contained are corroborated by Mr. Hunt's report, which has special reference to the extraction and assaying of gold:

"The Reports of the Survey have shown the presence of native gold both in the veins belonging to the crystalline schists of the Lower Silurian near Sherbrooke, in Leeds, and in St. Sylvester in the seigniory of St. Giles, and in those traversing the Upper Silurian rocks in the seigniory of Aubert Gallion (St. George,) (1) and in that of Vaudreuil at the Devil's Rapids in the Chaudière. While thus establishing the presence of gold in the veins of both the upper and lower formations, both of which might have contributed to the auriferous alluvions, the Reports of the Survey express the opinion that the greater part at least of the alluvial gold of Canada is derived from the Lower Silurian rocks. I may mention in support of the facts just cited, several specimens containing visible grains of native gold in vitreous copper extracted from a quartz vein which crosses the two concessions known as "The Handkerchief," in the seigniory of St. Giles, one of the localities to which you have already referred But inasmuch as visible gold has also been found in the veins of the Upper Silurian rocks, and as the largest specimens of gold in the gangue yet found in Canada are from the vein at the Devil's Rapids, I am led to believe that it is desirable to explore carefully all this part of the auriferous region in the hope of favorable discoveries.

" Although the veins which are now attracting most attention are those in the seigniory of Vaudreuil, numbers of similar quartz veins are found all the way southward to the frontier; and many have been discovered in the seignories of Aubin-Delisle and Aubert Gallion, and in the townships of Jersey, Marlow, Linière and Metgermette. Several outcrops of quartz appear along the Kennebec road; and at low water many of them can be seen in the beds of the Famine, Du Loup and their tributary streams, such as the Oliva, the Metgermette, and others already mentioned in speaking of the alluvial gold I may here notice especially the quartz veins which were, at the time of my visit, being examined in Liniere, very near the frontier. The encasing rocks here, as elsewhere, were clay-slates, and sandstones more or less calcareous. These rocks and their veins are already described in your report for 1863, pages 436—437, and more in detail in the Report for 1859, pages 50-52.

" The townships and seigniories which are the subject of the preceding remarks, are on the right bank of the Chaudière, but the veins for the most part appear to cross the river,—for I observed many outcrops of them on the road from St. Joseph to St. George, as well as on the shores and in the bed of the Chaudière. Several of these have already been followed, and uncovered on the left bank, especially in Vaudreuil and Aubert-Gallion. Other outcrops of quartz are seen on the road from Vaudreuil to Lake St. Francis, in the townships of Tring, Forsyth, Aylmer and Lambton, where I observed several near the lake. I regret not to be able to give you a detailed description of the quartz veins in this latter region, the exploration of which was prevented by the early snows; but I shall now proceed to state the observations which I was able to make upon the veins of which I have sent you specimens.

" In accordance with the instructions which I received from you, I have limited my examination of the deposits of quartz in the Chaudière valley to those which were already attracting attention in the region. If I have given you but short and incomplete descriptions of these, it is because in most of them the walls of the veins cannot yet be determined, and because not one of them had at the time of my visit been sufficiently opened to allow of a correct opinion of its character or attitude. I have therefore preferred to pass over in silence certain points upon which information would be desirable, rather than give opinions which could only be conjectural. I read in the *Géologie Appliquée* of Burat, "that although the theory of metalliferous deposits, based as it is upon numerous facts which are the same in all parts of the world, may now be regarded as established, the practical conditions, that is to say those which regulate the character and richness of mines, are altogether local" The study of metalliferous deposits in a district where none of the same kind are actively worked, is thus surrounded with difficulties and uncertainty; so that in attempting the examination, with which you had charged me, of the Chaudière region, it was neither possible for me to judge by analogy, nor to establish comparisons. A knowledge of local conditions moreover facilitates the estimation of the economic value of metalliferous deposits, for in some districts veins slender and poor at the surface, may augment in size and become richer in descending, while in others wide and rich veins, in working, grow poor and narrow. We must therefore in a new country. work in the dark as it were, until experience shall have fixed certain rules for guidance. With these reservations, and relying on the facts established and made known in the Reports of the Geological Survey, on the results obtained by the gold miners in the region during the last three years, and finally upon my personal examinations as set forth in the preceding pages, I conclude with the following observations.

"1. The auriferous deposits which cover a great region in Lower Canada in all probability contain, particularly in the valley of the Chaudière, considerable areas whose regular and methodic working on a large scale by hydraulic processes may be made remunerative; in addition to which limited deposits of exceptional richness, such as have been already found, may be looked for.

"2. Although the examination of the alluvial gold from the deposits hitherto worked does not permit us to attribute its source to veins of quartz in the immediate vicinity, it is nevertheless established that this alluvial gold is derived from the rocks of the region.

"3. The existence of native gold having been established, alike in the veins of the altered Upper and Lower Silurian rocks of the district, the

(1) *Esquisse Géologique du Canada*, page 63.

search for gold-bearing veins should not be confined to a few localities, but may be extended with probabilities of success to the whole area occupied by the altered rocks of these two divisions."

"DAMBOURGÈS—*Le Colonel Dambourgès, Etude historique canadienne.*" Coté et Cie., Quebec; 1865.—8vo, 58 pp.

This pamphlet contains a number of articles reproduced from the *Journal de Québec*, which bring to light many interesting details on the public and private life of Col Dambourgès, who distinguished himself for his bravery at the affair of Saut-au-Matelot in 1775. He was one of the few Frenchmen who emigrated to Canada after the conquest. François Dambourgès was born at Salies, in 1742, and came to Canada in 1763. In 1792 he took his seat in the first Parliament of Lower Canada for the county of Devon, but at the expiration of his term, refused to be re-elected. Many marks of favor were shown him by the Governors of Canada and also by His Royal Highness the Duke of Kent. He died at Montreal, on the 13th December, 1798. In a document signed by Col. Louis de Salaberry, father of the hero of Chateauguay, the act of bravery which has made the name of Dambourgès so well known, is mentioned as follows:

"I, the undersigned, having been major in the Royal Canadian Volunteer Regiment, certify that the late Capt Dambourgès commanding the Grenadiers, and senior Captain in the said battalion, has always been regarded as a distinguished officer It is known by all who served in the American war that Capt. Dambourgès always and everywhere served in a manner both honorable to himself and useful to the King's service. It will also be remembered that at the Saut-au-Matelot engagement in 1775, he was *the first to enter* the houses taken by the enemy, and that this act of gallantry was one of the causes of their defeat and of the preservation of the city, which itself was the means of saving the colony of His Majesty's Government. Mr. Dambourgès was then in the 84th Regiment."

MONTHLY SUMMARY.

SCIENTIFIC INTELLIGENCE.

—That interesting little shell-fish the Ianthina is well known to attach to its foot, near the posterior end of that organ, a long float, composed of vesicles of mucous inflated with air. The *Annals of Natural History* has a paper translated from Lacaze-Duthiers on the manner in which this curious apparatus is formed. He finds that the creature curls up the anterior extremity of its foot, thrusts it out of the water, and imprisons an air bubble. It then applies the fore part of the foot to the back part, secretes mucous, and fixes a mucous bubble. To this other bubbles are attached, until the float reaches the dimensions necessary to float the shell M Lacaze-Duthiers says that everything indicates that the shell and the animal are of a weight which does not allow them to swim without a float, and those which remain at the bottom of the water quickly die The air for the bubbles is not secreted by the animal, but obtained by thrusting its foot above the water. When the float is so damaged that the creature cannot reach the surface, it is unable to make fresh bubbles, and perishes.

—The alleged discovery of the grand *rere* of alchemist of olden times—the philosophers stone—whereby silver, mercury, and copper can be transformed into gold, has been just announced, in a memoir entitled "The Transmutation of Metals, presented to the Academy of Sciences," by MM. Henri Favre, doctor of medicine, chief editor of *La France Medicale*, and Juste Frantz, metallurgist; and on the evening of the 17th of February, M. Favre delivered in Paris a lecture on this subject to, as may have been expected, a densely crowded audience. The following is a *resumé* of the pretended discovery as explained in that lecture. Hitherto the science of chemistry has been founded upon two terms essentially distinct—extraction and combination. Analysis represents the first, and synthesis the latter. Now, to these two terms we must add a third—transmutation, always suspected to exist, but never proved. To do this it must be understood that all bodies in nature owe their respective properties solely to the fixation of forces passing momentarily to a static state, but always "evolutive" in a disposable field of action. These substances are then all produced by the action of one original and common principle brought into action. The transmutation is effected by condensation, or by the displacement of the forces which hold them for the moment in equilibrium. It is an exchange between the dynamo tensional efforts exerted by the agent employed, and, since the metals, simple in their chemical order, are compound in their dynamo-static state, it follows that the transmutation of metals can always take place, provided they are in media, in which the suitable elementary conditions will exist to effect the different changes. Such are the principles on which depend the operations of metallic transmutation. They have their laws. The first is that of solutions. It is on the difference of solubility of the metals that all the secret of transmutation empirically depends. The decisive transmutation of silver into gold shows that it depends on two distinct operations—the first is to change the state of the silver, producing another substance which is not yet gold; the second consists in bringing the condition of this new undetermined substance to the state of pure gold. The process is thus described: A certain quantity of chlorhydrate of ammonia is dissolved in liquid ammonia; this salt should be reduced to a fine powder. If the solution be turpid it is to be filtered; chloride of silver, perfectly white and humid, is then added, and the bottle well shaken up. The chloride of silver is dissolved, the solution becomes yellow, and deposits a precipitate of the same color, which must be collected most carefully. The characters of this powder are. 1. When introduced into aqua regia it is completely dissolved, and a new addition of ammonia precipitates it. 2. It is not fulminating. 3 Lastly, it furnishes gold by the galvanic pile—that is to say, when placed between the two poles of one of Bunsen's elements. Here is produced the most remarkable phenomenon—a transformation and a separation simultaneously The ammonia is the dissolvent of the chloride of silver, and at the same time the reactive of the metal transformed by the chlorine.—*Hunt's Merchants' Magazine.*

—M. Faye sums up a paper in *Comptes Rendus* (No. 25, 1865), by saying that "sun spots are not due to protuberances or clouds above the photosphere, nor can they be likened to superficial scoriæ; but they are openings accidentally made in a luminous envelope, the thickness of which appears to be composed with from 900 to 1600 leagues. Many irregularities, in appearance capricious, long observed by astronomers, and ascribed to a gyration analogous to that of water-spouts and cyclones, whether from a spontaneous tendency of spots to recede from one another, or from the material influence of adjacent spots, may be explained simply by a new irregularity in continuous variation of motion in different parallels. M. Faye adds that the regularity in spot movements appears incompatible with any hypothesis that makes the photosphere in absolute dependance on currents engendered otherwise than in the interior of the sun's mass. "The progressive retardation of the rotation of the photosphere as the poles are approached, is so regular, that we could not perceive in it the effects of cyclones confined to so limited an area as the external atmosphere."

—The *Archives des Sciences* supplies an historical notice of Santorin eruptions.—The ancients called Santorin Thera and also Kalliste, or the Beautiful. Pliny states that it rose out of the waters. The islands of Therasia and d'Aspronisi make with Santorin the shape of a truncated cone, of which the crater or centre is occupied by the sea, forming a space nearly three leagues long and nearly two wide. In 235 B. C. a violent earthquake separated Therasia from Santorin. In the sea space just spoken of are three islands, named Kameni. The most ancient of these, Palea Kameni, appeared above the water with flames that lasted four days in the year 186 B. C. In 19 A. D. the island Thia made its appearance, and another island came up in 60 A. D. Both these islands are now united to Palea Kamene at Hiera. In 726 A. D. flames, stones, and smoke were ejected, and rocks emerging from the sea joined Hiera. In 1457 and 1508 it received fresh additions. Mikra Kaimene rose up in 1573, with a crater forty or fifty feet high. In 1650 fresh earthquakes occurred, and an island to the north of Santorin was formed, and subsequently destroyed. In 1711 a shoal appeared without a shock or eruption, but earthquakes soon followed. Movements of elevation continued, but no further eruption occurred till that of the 28th and 29th of January, 1866, when flames burst forth accompanied by violent noises. On the 31st of January, the promontory of Volcano was split off from Nea Kamene. The little island thus formed sank sixty centimetres in two hours, and after sank at the rate of ten centimetres an hour, and the inhabitants took to flight. On Feb. 1., the sinking was at the rate of five centimetres an hour. During this time, flames continued between the two Kamene. On the following day, Feb. 2, a shoal came within a fathom of the surface, between Nea and Palea Kamene, where English charts showed forty-five fathoms of previous depth. From Nea Kamene this shoal or island was seen hour by hour to rise slowly and silently, without smoke. By the evening it was fifty metres long, ten or twelve broad, and twenty or thirty above the sea. On the 3rd and 4th it grew still bigger M. Lenormont thinks that this isle occupies the place of the Isle of Thia, formed in 19 A. D. On the 9th of February the island was still growing, its dimensions then being 140 metres in length, sixty-five bread, and forty-five in height, and at night it looked like a mass of coal in combustion. On the 9th March, we see from *Comptes Rendus* that M. Fouqué found the island fifty metres high. The island Aphroessa formed on the 13th of February, he found to be about 100 metres in circumference, and fifteen to twenty metres above the sea. The new formations are of a black, vitreous, very felspathic lava. On 10th inst., a new island was seen near Aphroessa which did not exist the evening before. It was thirty to forty metres in diameter, and a metre and a half above the sea.

STATISTICAL INTELLIGENCE.

—A mighty change seems to be dawning over the destiny of New Zealand. The sand on its sea-shore, the rivers flowing through the length and breadth of its land and the mountain ranges from the north to the south of each island, all seem impregnated with gold to a greater or lesser degree. The Hokitika diggings since they have been worked, a period of only a few months, have turned out about £700,000 worth of the precious metal. A correspondent from that locality writes as follows: "And as to the reality of the ground as a goldfield, I think there cannot be much doubt, when within one month more than 45,000 ounces of gold were exported, and I doubt not the present month will be far in excess of this. A few days ago I happened to be out riding, and selected the beach north of the town, on which to take exercise, and found the whole of the beach for miles was being occupied with diggers, who are mining just above highwater mark, and are washing out of the sea-sand sufficient gold to produce from £5 to £20 per week per man. In fact, nearly the whole coast from the Grey River down to Bruce Bay is a magnificent goldfield; and inland, too, for miles, men are gradually extending the field. During the last fortnight there have been several rushes up to the foot of the snow capped Southern Alpes, where the diggers are finding good payable gold." The total value of New Zealand gold exported from the colony up to the 30th June last was £7,646,809, and the number of ounces was 1,947,667. The principal localities from whence the gold has been obtained hitherto have been Otago and Christchurch provinces, but the whole of New Zealand is believed by geologists to be auriferous.

— A very interesting table of the mortality in the Federal Army during the late war of sections has been published in Washington, evidently by authority. It states how many died of disease, and from casualties in the field; and also the number of men enlisted and furnished from each State. New York for instance placed 381,696 men into the ranks, 31,852 or about 10 per cent. of whom died in the service; — 14,445 of severe wounds, or on the battlefield, and 17,407 from disease in hospital. The great states of Pennsylvania, Ohio, Illinois and Indiana come next on the list, and in every instance, (with the single exception of Indiana, where the mortality rises to about 19 per cent, only 4 per cent of which however, was the direct result of wounds,) show an average mortality of 10 per cent. Before the publication of this table, many persons were under a far different impression as to the extent of destruction of life caused by the war. Most of the greater battles that took place were spoken of as something horrible in the extent of their slaughter, and gallons of (not to say barrels) of ink were exhausted to prove how the combatants had surpassed in heroism, bulldog tenacity and pluck, the puny blows, and the vacillating courage of the effete and worn out veterans of the old world. According to the Federal newspapers a battle was no battle unless from forty to fifty thousand were killed or wounded in it. The smoke and exaggerations have, however, since been cleared away; the army correspondent; "the reliable gentleman from the South;" "the intelligent contraband;" and "the loyal refugee"—no longer tell stories for a sensational press and divested of its trappings and horrible accompaniments, the great Moloch our neighbours had set up shrinks to the very moderate proportion of 10 per cent for losses in both field and hospital, of the total combatants, all told. The war lasted four years, and at different times, these tables inform us, no less than the enormous number of 2,154,311 men were engaged in it, on the Northern side alone. Some forty or fifty battles of great alleged magnitude were fought, not to speak of outposts and skirmishes, and still more considerable affairs. Yet from the whole the returns give only 96,089 men killed and died of wounds, and 180,420 of disease. In other words, nine out of ten of all who went to the war from the North returned in safety to their homes; and only a small proportion of this mortality came from wounds on the battle-field. Disease was far more fatal than the battle. So far, in fact, from the recent war of sections in the United States being more severe and more exhaustive of human life than ancient wars, or wars in modern Europe, as ill-informed persons here under the ridiculous inspiration of the spirit of inflation have pretented, they quite dwindle to small proportions when a comparison is made. In the ancient Roman hand to hand wars, sometimes half the combatants were left on the field; and there was great significance in the couplet of the lay:—

"The kites know well the long stern swell,
That bids the Romans close."

If in modern wars we take the single battle of Borodino, we find the Russians lost 45,000 men in killed and wounded (including thirty-two general officers), while the French lost 50,000—making a total loss in one battle of 95,000 men. Again, if we take the single campaign of Napoleon into Russia, the Grand Army when it marched numbered 580,512 men. When it recrossed the Nieman the total of those who escaped numbered only 42,200, showing a loss of 538,313, or over half a million of men! The French admit that, in that campaign, they had 125,000 soldiers slain in battle, the rest died miserably by the road side, or were taken or scattered. The French lost more men in that single campaign than both the North and South put together in the whole four years war. In fact the work of war done by both North and South as we sit coolly down to look at results, was very small indeed, not to say, comparatively speaking, ridiculously so, when we consider the very great material resources and numbers of men employed. In fact our neighbours have not yet established that they are the most wonderful military nation under the sun. It is matter for rejoicing in the interest of civilization that there has been less bloodshed than was supposed in the late unfortunate war, but it is better that there should be no misapprehension respecting the facts of history.

MISCELLANEOUS INTELLIGENCE.

— The following comparison between Ottawa and the other cities which have in succession been the seat of our perambulating government, is due to a correspondent of the *Montreal Gazette*.—

"There are people living here who think they have been sent into banishment, and they sigh over the houses they have left in Quebec, long even for a return to Toronto, and are loud in their declaration of opinion that Montreal is the proper place for the seat of government—a fact which any one with half an eye may see, they say. As a Montrealer, with the modesty which is universal among Montrealers and so well becomes them, I say naught on this latter point. Respecting Quebec, I will frankly say I prefer it to Ottawa; there is the charm which age and old traditions gives to a place, attached to it, pleasant recollections clustering about it, the most beautiful scenery in Canada, and a certain polish and air of good-breeding among the people which only members of a long-established society can have. I fear that in my heart of hearts I am just a little a traitor to Montreal, that I like Quebec best and Halifax next best of all places in British North America. It is true they are old and slow, but their environs are wondrously beautiful and their people hospitable and endowed with *savoir vivre*. You see signs of wealth with less ostentatious display, and money-getting with less of the hardness born of commercial greed and eager pursuit of gain than in most other places on this continent. Toronto, which will always be remarkable as the seat of the chief law courts of the western province and of its great educational institutions, with a more genial climate and great agricultural wealth all around it, yet wears a desperately hard, matter-of-fact look to me, and I never could see its charms. Men who make their homes there like it, and I will not dispute their taste. They have built some fine buildings there and should have a fine town.

"It is a curse of railways—in the eyes of the pleasure traveller—that, wherever it is possible, they run through the very dreariest of flat country. I am assured by those who have traversed these counties by the old post roads that there is much fine land and some pretty scenery, and that not far from the railway line. We did see a few fine farms—that of Mr. Billings being among the best—and at the Kemptville station caught sight of the village a half mile away. But for the most part our way was scarcely less dreary than that over the dreary portion of the Quebec and Richmond road. It is growing better as cultivation is creeping down to the line—which opened a way for itself through the forest for the most part, at first. Ere long let us hope the approach to the capital will be through the more smiling aspect of well-cultivated farms and pleasant homesteads. Now one feels a good deal as if plunging into the back woods—when a curve in the road brings you suddenly in sight of a hill-crowned with the Parliament House and Government offices of Canada. Your first feeling is one of surprise—how buildings worthy of London or Paris had got there. With the setting sun shedding its glowing light upon them, and lighting up tower and pinnacle, and bringing out buttress and shaft and angle in bold relief, you almost fancy there has been magic in the work, or these are the remains of the work of generations long since passed away, gone ere this waste of trees was planted and that nature has re-asserted a dominion, which, in fact, she has never yielded up. These are palaces fit for a feudal monarchy. You look around in vain for the culture which serf and villein began, and free yeomen have carried on. These are achievements in architecture, worthy of the wealth of a great capital, which the concentrated wealth of a nation has embellished. Where are its quays, its streets, its steeples, its suburban villas, its public monuments? You look for them in vain. These are gems without any fit setting. We must trust to time to furnish that. Ottawa looks more awkwardly to-day in possession of these buildings than David would have done in Saul's armor—that of Goliath had furnished a better simile. One cannot resist the feeling that if the town is a fit capital for the country, then the buildings are much too big and ambitious for so small a country; if the buildings are befitting the country, then the capital town is not. This is the irresistible conclusion that one arrives at, comparing the two things as they now exist. But time, which works wonders, may cure this, and make the town worthy of the Public Buildings. Let us have patience. Ottawa is now a straggling town covering a good deal of ground, with some very excellent stone buildings, some fine shops, but a great many wooden cottages, not unlike the suburban villages of St. Jean Baptiste, at Montreal and of St. Sauveur, at Quebec. When straggling streets shall be filled up, and wooden houses converted into brick and stone, there is enough of Ottawa even now traced out to make a fine little town. In many respects its site is a very fine one. Will it have trade enough to make it grow, and bring together a considerable number of rich men and well-to-do tradesmen, who will fill up streets with fine houses, not dwell apart in villas near their mills, with the rude cottages of laborers in mill or forest around them? Is that vision of Western trade down the Ottawa, which Quebec and Montreal are as much interested in as Ottawa, to come as a reality; and will it bring the anticipated wealth to this city? Time alone can solve these things: let us hope it will not be a long time ere Ottawa proves herself worthy of her present good fortune.

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