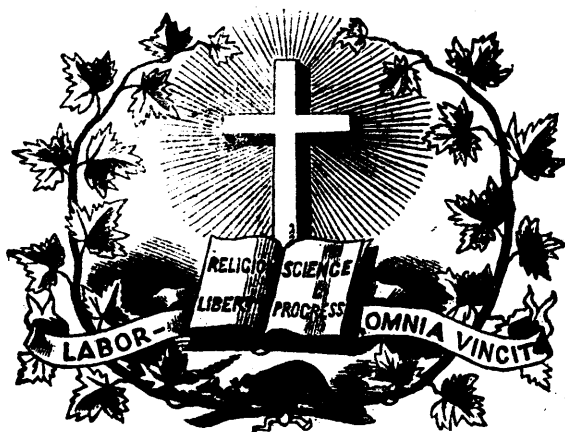


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On Physical Education: Its Neglect, Effects and Promotion. (1)

I. Neglect of Physical Education.

The destiny of man is not only to exercise his intellectual and moral faculties: he must also act, resist, struggle. Our modern civilisation, with all its contrivances of machines and instruments, that work and act for us, seems to have caused a great disregard and neglect of the instruments with which nature has endowed us. But, if some unforeseen event cast us out of the circle of our conveniences; if we have to struggle with physical agencies, as cold and heat, with fatigue, with the elements, with animals, or with our fellow men; then we lack that courage and confidence which, as Montesquieu says, is but the consciousness of man's strength, and we succumb helpless.

The ancients understood far better than we the harmonious development of body and mind. The maxim of their sages, *mens sana in corpore sano*, was among them

strictly adhered to. Bodily exercises were celebrated in song, and glorified in the annals of history. They were constantly practised in the gymnasia; and the heroes of public games enjoyed an almost idolizing adoration. Both in Greece and Rome physical education was regarded as the foundation of material and intellectual, public and private welfare; and the soundness of this view has been proved by striking results.

The student of history will observe, that whilst mankind has made enormous advances in civilisation in general, it has, in some respects, gone backwards. This is especially the case with regard to physical education. The educational principles of the ancients, so entirely in harmony with the constitution of man, have been gradually abandoned. It is true, that much has been done, especially in our own time, for education. But, with all the endeavours made to advance intellectual education, one thing seems to have been overlooked—that man has a body, which stands as much in need of development as the mind. While attention has been bestowed almost exclusively on the former, the latter has been left to natural instincts, and dependent upon the fortuitous course of bodily occupations. Thus, a kind of estrangement has sprung up between mind and body; the mind, regardless of its partner, has soared aloft into regions of ideal life, while "the temple of the spirit," like a neglected dwelling, has been allowed to fall into premature decay.

The first neglect of the body commences in the nursery. The tender heart of the mother rarely regards the future physical development of the infant. She cares more for its present wants and wishes, and but too readily assists and encourages sensual desires, through which the child is spoiled, often for life. Fashion, food, and clothing, all tend to promote enervation among the young. The sun must not discolour the sweet, pale little face. The flower is to grow up in the shade. The little girl must, at every step in the sun, be protected by a parasol. All sorts of articles of clothing, gloves, furs, &c., are to envelope the little boy during inclement weather. Thus the child is brought up, incapable of bearing heat or cold, wind and rain. Instead of inuring it, at an early age, to endurance in walking, it must be wheeled about in a

(1) A paper read by Professor D. Schable, F. C. P., before the Royal College of Preceptors, London.

perambulator. The child is naturally fond of running about, and playing in the open air with other children. But the mother fears lest it might become rough and unmannerly by such unrestrained mixing in play with its fellow little ones; so it must therefore stay at home, and renounce playmates and childish games.

This pernicious system is continued in elementary schools. At school every possible exertion is expected of the mind, but the body is left to itself. No time is left for exercise or play. Even in infant schools we see education pursue this unnatural course. For unnatural indeed it is, to drag the little ones from their cheerful and free life of youth from the fresh and invigorating air, to crowd them together in the close atmosphere of a room, there to be trained to sit still, and to be crammed with indigestible intellectual food. Parents and teachers take all possible pains to produce, as early as possible a dangerous *polymathy* in their little ones, forgetting that too often the consequence is the early fading of the tender plant. In infant schools especially the development of the tender body of the child should be the first care, and suitable games should furnish the first occupation of the mind. Special bodily exercises, adapted to their age, should accustom them to attention and order. The younger the children, the more unnatural is it to compel them to sit still, keeping the body long in one attitude. The fashion is now to commence the mental training of children as early as possible. Experience shows, however, that physically healthy and vigorous children soon overtake the physically weak ones. It is an acknowledged fact, that long hours passed on school forms, without change, especially in the case of lively children, is the source of manifold evils.

In higher educational institutions, where the demands on intellectual activity are far higher than in elementary schools, the mind is still more burdened; and, besides the hours devoted to instruction, little time is allowed for systematic and regular exercises for all, during all seasons and weathers.

What are the consequences of such an unnatural and defective education? A premature and excessive straining of the mind engenders precocity, and thereby moral and physical development is arrested. The entire vital activity is directed to the brain, which thus receives a premature and one-sided development. The excessive amount of vital force monopolised by the brain is taken away from the other parts of the body, and an early cessation of growth is the consequence. This produces men unfitted for exertion and for the battle of life, who too often, after a sickly existence, sink into an untimely grave. Depression of the heart, irritability of the nervous system, weak digestion, rheumatism, consumption, vertigo, curvature of the spine, and a host of other diseases, are increasing among our present generation, in consequence of sedentary life, insufficient exercise, and muscular weakness. Especially do the evil consequences of neglected physical development show themselves in the female sex, with whom bodily exercises are entirely neglected. The changes introduced by modern life have a deteriorating influence on the race. Men have left, and are leaving, the fields, and the cultivation of the soil, and congregate more and more in towns. In these crowded resorts hundreds of thousands are chained to the desk, millions to the workshop. It has been proved, it is true, that the average duration of life is now higher than in former times. But this is owing, not to the habits of life, but to the progress of the science of health and of comfort, which now preserves the lives of many who in former times would have succumbed. If we would establish a correct comparison between the present and former times, we must not consider mere longevity, but

the proportion of prevalent diseases, and the general sanitary-state of the community. Many a life is now kept on going from year to year, to transmit, in many cases, the questionable boon of ailing life to a feebler progeny.

The consequences of a too early development of the intellect only, to the neglect of the body, are sadly manifest also in a moral point of view. There is no doubt that an early and too rapid intellectual development, taxing especially the memory and imagination, often leads to a life of sensuality, and the fading away of many in the prime of life. Weakness of body induces feebleness of will, despondency, irresolution, a tendency to abandon work which does not succeed at the outset. Weakness of the body further induces a lack of the conscious independence of freedom. Man is like the reed, bending with the wind; tossed on the waves of fate, without will and energy, he has no heart to confront danger alone, trusting in his own strength. A too early sedentary existence, a too one-sided intellectual education, want of vigorous open-air exercise, suppression of the innocent enjoyments of life, arrest the development of the senses, and with it also the cultivation of the understanding and the heart. What has been obtained in a short time by superexcitation, is soon again lost.

The injurious consequences of such a mode of education are felt in the state as well as in the family; in a political, social, and military respect. Many more evil consequences of exclusive mental training might be mentioned. It must not be imagined, however, that I speak of our present intellectual education as excessive. Let us develop the mind in a natural and comprehensive manner, at the right time; but let us aim, at the same time, to establish harmony between mind and body. Not the power of intellect alone will avail us in time of need; not intellectual attainments alone will secure our happiness; we must also have health, strength, bodily skill, generous sentiments, and firmness of will.

We need a change in our system of domestic, and school education. Out of school-hours our youth should be led to the gymnasium, there to develop their physical powers, to renew their spirits, and arouse their youthful ardour in invigorating exercises and games.

Every philanthropist, and in particular every teacher of youth, should therefore lend his helping hand to bring about the resurrection of "the daughter of the Hermes," Gymnastic Art, the restorer of youth, the dispenser of health. Gymnastics reinstate the human body in its functions; they strengthen also the chest, steel the muscles, give wings to the feet, cause the blood to course in a livelier flow through the veins, invite to the enjoyment of the pure air of the fields, and maintain and spread, as it were, an everlasting youth over all the ages of man's life.

Many are, at present, prejudiced against gymnastics; they entertain a low notion of them, seeing in them but useless, if not dangerous, performances of showy feats of strength. Others think that they may be useful in towns, but only there. Few appreciate gymnastics as a part of general education of youth, as a means to train not only the physical, but also the intellectual and moral faculties. True happiness and perfection in man exist only when he is in full possession of all his faculties. The great educational object of gymnastics is to promote that fine harmony between mind and body, which was presented to us in the life of the ancient Greeks. This can only be done by a thoroughly scientific system of gymnastics, as a part of the regular school-curriculum, and conducted by thoroughly trained teachers. At present, gymnastics have attained a degree of perfection. But they have until now been practised by comparative

ly few, being banished from most schools, and frequently taught by incompetent teachers. To show that their aim is of greater educational importance for all classes than is generally believed by educators, is the object of this lecture. I purpose to consider the subject from a *physiological, psychological and practical* point of view.

II. Cooperation of body and mind.

After the foregoing observations, I proceed now to point out the necessity of physical training, by considering the relation between body and mind. In attempting to do this, the problem presents itself of determining the part that the physical faculties perform in the development of man. Is there an antagonism between physical development on the one side, and intellectual and moral development of man, as has sometimes been asserted? It has been, and is still, the habit of opponents of physical education to associate physical force with stupidity and brutality. This sophism is based upon examples of athleticism in its most exaggerated and degenerate form; upon the fact of many great men having had weak bodies; upon confounding systematic physical training with the profession of the mountebanks, upon the injury that unsystematic, one-sided, and excessive muscular training causes to the mind; and from such instances as these it is inferred that the body cannot be trained but at the expense of the mind; that a certain quantity of common aliment has been fixed by nature for both, so that in case of the one requiring a larger share, the other must necessarily suffer loss.

The Greek and Roman professional athletes were certainly heavy and stupid, as Galenus says. But the cause of their brutality is not to be ascribed to gymnastics, but to their abuse of them, and to their irregular habits. These athletes offer the very best proof in support of *equilibrium* in the faculties. By the side of such immoderate and disproportionate use of bodily exercises, we may place excesses in an opposite direction; we see exclusive and excessive labors of the mind, leading men astray, and launching them into a world of unreal, unsound, and extravagant ideas. Similarly, the moral faculty also may degenerate into excess, in consequence of having been exclusively cultivated, detached from the other faculties, and left without counterpoise, and corrective. History affords numerous instances of aberrations of the mind, whether of a sacred, profane, or mystical character.

But is it true that great men have been remarkable for the feebleness of their constitution, as has been said? They were feeble in feeble nations, but strong among strong nations, according to the habits and manners of their age or country. If Pascal and Voltaire had feeble constitutions, Themistocles, Alcibiades, Socrates, and Plato excelled in the exercises of the gymnasium; on the broad shoulders of Plato sat the most intelligent head of Greece; the young Alexander broke Bucephalus before the astonished court of Philip. Witness, too, nearly all the great men of Rome: Sertorius swimming across the Rhone in full armour; Cæsar in Gaul; Pompeius, of whom Sallust says—"Cum alacribus saltu, cum velocibus cursu, cum validis recte certabat."

It has been maintained that, in consequence of an antagonism between the muscles and the brain, the state most favourable to intellectual work is that of languor of the body, where activity of the senses or muscular excitation may not disturb profound meditation. There is no doubt that such a state favours intellectual dreaminess. But for keeping the head clear and within the sphere of reality, and for reinvigorating the mind, there is nothing like keeping the springs of the machine at a

due degree of tension. J. J. Rousseau found that walking revived his ideas, and gave freshness to his feelings and sensations. In his brilliant improvisations the orator tunes his body to the diapason of his mind, accompanying his words by energetic movements and gestures.

He who, devoted to intellectual work, has learnt to temper the labour of the mind by the salutary diversion of muscular activity, knows well the magic influence that fatigue of the body exercises on the vigour of the mind. The head has become heavy and embarrassed, the confused ideas come thronging in upon a mind incapable of separating and classifying them; words pale and colourless present themselves to express hazy and imperfect thoughts; the reasoning process proceeds painfully: an hour of walking, riding, or lively play dissipates the clouds; and, as *Boileau* says, "the words, which had fled, arrive at the other end of a wood."

Again is it the fact that physical development impairs that of the feelings and moral qualities? Certainly not. It may be that now and then a strong and energetic man does not feel with that delicacy which is peculiar to woman, and to some constitutions which are as it were intermediate between the sexes. But the feelings of honour, loyalty, fidelity, and respect for the institutions of nature, of the family, of society, are found equally in both natures. How many men are there, who, having spent a life of labour, hardship, and continual struggle, have nevertheless feelings as fresh as their countenances, and hide, under an iron body, a heart of gold!

However different mind and body are in their nature and functions, they form together an inseparable whole. True education therefore ignores a separation of mind and body; it acknowledges only the cultivation of the whole man—of the understanding, the heart, and the will, as well as of the senses and muscles. If one part of the system suffers, it knows that the whole man suffers. *Schiller* says:—"The cheerful string in the body awakens also the cheerful string in the soul; so does the mournful tune in the former arouse the mournful tone in the latter." What is beneficial to the body, is so to the mind. *Perfectly healthy is the mind only in a healthy, sound body.* Education must therefore aim at giving to the mind a sound and strong foundation; it must consequently follow the rules of hygiene, by striving to bring into harmony intellectual and physical activity, exertion, and re-invigoration.

The body is the instrument of the mind. It is the executive of its thoughts. As such it has various functions to perform through its different organs. For my present purpose, the organs of sense and motion require special attention. Man in his perfection requires that the former be sound, keen, and quick, and that the latter be healthy, supple, strong, prepared for instant use. A well developed organism will exercise a great and salutary influence on the mind, and elevate the intellectual and moral life. True perfection of man is, when the intellectual and physical are closely allied, when nothing contrary to nature disturbs the harmony between body and mind, when all the faculties work together, when will and deed act in unison, when the body duly executes what the mind directs. A man thus developed possesses moral courage; he delights in mental and physical work, has strength to suppress sensual predispositions in the bud, independence with regard to social and natural influences. The life of youth passes for him in purity, full of noble, generous impulses, and a vigorous manhood and hale old age are his reward.

While thus every effort of human power is a work of united activity of mind and body, nevertheless the one activity may predominate over the other. The mutual cooperation is checked and impeded only when the body,

in its nurture, is treated ungenially—when it refuses from incapacity to perform its office of servant to the mind.

The inner man is manifest in the outer man. Purity, truth, frankness, unaffectedness have their expression in external features; as also have falseness, cunning, impurity, hypocrisy. Grace, a noble carriage and gait, are outward signs of a noble inner man; just as a swaggering air betokens conceit. The countenance of the free man is noble; that of the slave is ugly and repulsive. The body, then, is the expression, the image or mirror of the mind; and dignity and beauty are, therefore, also the fruits of physical training. *Kalos kai ayathos*: said the Greeks. Though here it must be observed, that real beauty does not consist in a certain form of features and figure, but in the external expression of nobility of soul.

(To be continued.)

Chancellor Woods on Technical Education.

(*Pennsylvania School Journal.*)

I address the representatives of the 19,000 educators of our large, rich and influential state, to whom is entrusted the moulding of our 12,000,000 youth. Not our fertile soil, or our many manufactures, in themselves considered, are of so much importance as the brain and brawn of the youth who are to cultivate the soil, and increase and perfect these manufactures, thus giving us the high rank we should attain among our sister states. However humble our work as teachers may be regarded by those who measure men by their annual income, or their display of dress and equipage, measured as every work should be, by the good done, it is second to none. I do not address legislators, sensitive as an aspen leaf to the popular pulse; or manufacturers, looking eagerly at the profits of the present year; but those who sow for others and the future; who toil, not to mine coal, or make pig-metal, but to build up true, intelligent men and women.

I address you on a practical subject, and desire to do it as earnestly and with such statistics and facts as will impress you, and, through you, others in different parts of our State, with the great importance of the subject, and secure such action as shall advance the good of our youth and the interests of our state. And I propose to do it in a plain, unadorned manner, stating some of the many facts before me which favor education in the theory and practice of the arts and trades of all kinds, "that special education in our calling which should fit and enable each of us to discharge in the best manner the special narrow round of duty by which each citizen fills his own personal place in social life."

As teachers, our lives are not those of idleness or ease, but of severe, exhausting labor on material as varied in its nature as the different combinations of matter with the multiform elements of mind and heart, can make it.

To make an ingenious piece of machinery requires labor and skill; to mould and fashion a soul demands the exercise of the highest powers with which man is endowed. To create is the province of the Omnipotence; second only to this is it to develop that which allies man to the Creator. Education is "one of the greatest and noblest designs that can be thought on, and for which this nation perisheth." And yet the puddler, cutting tailor, glass-blower or sheet worker, receives greater compensation than the soul-moulder, who fashions for eternity. More is paid for the covering than for the object covered, for the setting than for the jewel.

Our duty as educators is not simply to instruct in one or a few studies, but to decide on the comparative value of different studies to different studies, with different capacities, tastes, and purposes. The object to be moulded, and the use to be made of it, should be understood. What may be most useful to one at one time, may not be so at another time, or to another at the same time. The fit thing to be studied, in the fit quantity, at the fit time, is to be decided—what will be best suited to furnish, stimulate, and strengthen the mind for the future work. The question is not whether a certain study is useful or not, but whether it is the most useful for a certain student at a certain time, in his circumstances, and with his intended business or profession, and this too without reference to the taste, profit, or convenience of the teacher. To undervalue and disparage what we do not possess, is a fault no less common to the teacher than to others.

The classics have been denounced as useless, and even injurious, a great waste of time. That they have been studied by those who should have devoted their time to other more practical studies, and by persons who had no taste or faculty which would enable them to be benefited by them, there can be no doubt. The same may be said of the higher mathematics, and many other studies. More time may have been wasted on the Elementary English branches from commencing them at an improper time, studying portions comparatively valueless, and from defective teaching. The classics give us a knowledge of the sources of our modern culture, and in no small measure of our religion, polity, law, art, and history. They are admirably suited to give us a knowledge of words, to improve the judgment, develop the mind, and to give finish and completeness to the man. All who would be accomplished scholars, or thorough professional men, and all who have the time and means, should study them.

The very men who ridicule and condemn the study of the classics as a waste of time, will teach other branches to such persons, and to such an extent or in such a manner, as will prove an injury and loss to them. The youth who is to leave school at fourteen, is required to spend all or an unreasonable portion of his school life on unimportant parts of geography, grammar and arithmetic, to the total neglect of drawing, elementary chemistry, physics and other branches of knowledge, an acquaintance with which is essential to his success in life. The acknowledged waste of time on the classics by those who have no time or capacity for them; or who pursue them to the neglect of more important studies, is, however, sustained by comparatively few; the loss from entire neglect, or injudicious teaching of many of the primary branches is sustained by the many. Less than four per cent. of our youth extend their studies beyond the common elementary branches. An error, therefore, in our educational methods, for these branches affect twenty-five times as many persons as in the case of the classics. So, while gazing at distant objects, we have stumbled into holes immediately before us. Such is human consistency!

The relative worth of different kinds of knowledge to the student has not been sufficiently regarded. The studies he has pursued may be valuable, and to the extent to which he has pursued them, whilst they may be less so than other studies that might be in whole or in part substituted. An immense amount of information bearing on the industrial activities, which should be understood by all, has been passed over, while the less useful has been studied. There has been a tendency to regard the useful as ignoble.

The answer, then, to the question, What should our youth study? has not been intelligently given. The

philosopher said they should study that which they will most need when they become men. Wm. Penn, in writing to his wife, in relation to the education of his children, said, "Give them learning, but let it be useful learning." The people are generally convinced, now, that the classics have occupied an unreasonably large part of the time of many, and that studies having a closer connection with the intended pursuits of our youth will be more useful. The opposing current has fully set in. Care should be taken that we do not go to the opposite extreme, seeking only the immediately practical. Universities do not exist merely for the purpose of training men for their special crafts or trades. To ridicule any ulterior end is irrational. "The man is more than the trade." Practical, skillful men in the trades and arts we need. To have them we must educate them. They will not grow of themselves. God will not work a wonder to help us when he has given us wherewith to help ourselves. Especially are such men demanded in our state, where there are so many persons engaged in agricultural, mechanical, engineering and mining pursuits. To advocate such an education is to advocate the highest interests of our Commonwealth and its toilers.

The opinions of men as to the comparative value of studies, have varied greatly at different periods. Archimedes regarded it as degrading to science to be useful, to contribute to the wants and happiness of man. According to Seneca to impute to man any share in the invention or improvement of a plough, a ship, or a mill, was an insult. It is in accordance with that spirit that practical studies, those which relate to the daily employments of life, are now stigmatized as "bread and butter sciences." In the middle ages alchemy, astrology, and dialectics were the cardinal studies. In the latter part of this period, Gerard Groot, a mighty preacher in the mother tongue, said, "Spend no time on geometry, arithmetic, rhetoric, dialectics, grammar, poetry, horoscopes, or astrology. Such pursuits are denounced by Seneca, much more by Christians of a spiritual mind. They avail not for the spiritual life." About the same time Hegius said, "If any one wishes to understand grammar, rhetoric, mathematics, history or the Holy Scriptures, let him study Greek. We owe everything to the Greeks." At a later period, Latin was recommended for all. Being the repository of the learning of the world, it is not strange that a knowledge of it should have been required of all students. In 1854, President Francis Wayland, one of the best educators and noblest men our country has ever had, having eight years before expressed his dissatisfaction with the then existing course of study, in an address at Union College, said :

"It would seem that our whole system of instruction needs an honest, thorough and candid revision. It has been for centuries the child of precedent. If those before us made it what it is, by applying to it the resources of earnest and fearless thought, I can see no reason why we, by precisely the same course, might not improve it. God intended us for progress, and we counteract his designs when we deify antiquity and bow down and worship an opinion, not because it is either wise or true but simply because it is ancient."

Soon after this, Prof. Chase, of Brown University, gave eight lectures to 353 jewelers and other workers in metals, on "The Chemistry of the Precious Metals." These lectures gave great satisfaction and profit, and remarks were made by the workmen showing how much they felt they had lost by not having received such instruction before.

In 1858, that invaluable article "What knowledge is of the most worth?" gave a fresh impulse to the new departure. To answer the question of Herbert Spencer

wisely, and to give to all the students in our schools, colleges and universities, the knowledge of most worth to them, should be the object of all educators. So multiplied have the sciences become, and so increased the range of studies, that we cannot compel the student to follow a routine suited to past centuries. The two different opinions as to the object of education still prevail; Froude says it is to prepare the student to "dine in his food and clothing; Matthew Arnold says: "To know is sublime; to do, base." To recognize the change that has taken place, and adapt ourselves to it, is the part of wisdom. We cannot sympathize with the distinguished Greek scholar, who, on his death-bed, lamented that he had not spent the last twenty years of his life on the dative case.

The old and rich institutions of England are slow to adapt themselves to the changes in learning. In Cambridge, it is said, a man may yet get the highest honors in mathematics and natural philosophy, and have never seen a crystal, a lens, an air-pump, or a thermometer; and at Oxford he may get his first honor in natural science without knowing the binomial theorem or the solution of a triangle. Yet in technical education we are far behind England and the continent, where are numerous richly endowed institutions fitted to give instruction in practical education. They have consequently acquired great superiority over us in many of the arts and manufactures. We have been too well satisfied with ourselves and our school system, and have not educated our youth in the arts so as to develop without "trial and error," and without the most lavish waste, our abundant natural resources. Our wealth has reached the sum of \$30,000,000,000. But we forget that we are in most cases exhausting our virgin soil without seeking to restore it; that we are consuming our vast stores of mineral wealth and recklessly destroying our forests. In the year 1870 this transfer of wealth from the surface and from beneath the surface, after deducting the cost of labor and material, was \$1,183,410,861, or one twenty-fifth of all our computed wealth. We took our riches from the earth, and, aided by foreign capital to the amount of \$1,400,000,000—our supposed entire foreign indebtedness—we erected our edifices, built our ships and railroads, and fancied ourselves more wealthy by this entire amount. We forgot that the change of a dollar from the purse to the hand, where it could be seen and counted, is not an increase of one dollar in our wealth. It was a dollar, and is a dollar still. We forgot that it is labor which creates wealth or enhances values, and, so far as labor was employed in developing our resources, to that amount, and to that amount only, it has added to our wealth. Of this vast natural wealth we must not be too prodigal. We have, it is true, one of the richest countries on the earth; a fertile soil, extensive forests, and an abundance of oil, coal, iron, salt, gold, silver, lead, copper, nickel, slate and marble. Much of our soil has already been exhausted through bad agriculture. We are less careful in this than the Chinese, who see that every element taken from the soil is returned to it, so that there shall be no waste. Our woodlands have been so recklessly stripped, noble forests often girdled and left to stand for years to decay, monuments of our wastefulness, that the cry, "Forebear!" is coming up from all parts of our land. Our iron and coal, too, have been used without regard to economy. What we want is to use all our abundant material so economically as to have no waste, and to apply to it so much of skilled labor as will add the most possible to its value. The labor, too, should be applied in this and not in foreign countries. To send our cotton to England and bring it back, paying for it many times what we receive, or to send over our wheat to be

converted into labor, is doing what England did from Alfred to Edward the Confessor—selling our skins for a six pence, and buying the tails for a shilling. We have no faith in the opinion, early expressed in our country that we should confine ourselves to agriculture and avoid manufactures. This would make us the slaves of foreign countries, simply tributary to their wealth. An agricultural people can never become wealthy or powerful. What we do want is intelligent, skilled labor to enhance the value of the natural wealth of the country, and send it to the market increased in value one hundred or a thousand fold. How greatly labor increases the value of the material, can be easily illustrated. Aniline colors, surpassing in beauty the Tyrian purple, are made from coal tar, until lately a worthless refuse: and the Aniline blue sells for \$28 a pound. A pound of cotton, costing 12 cents, made into muslin of good design, sells for 80 cents, and into chintz, \$4; a pound of the finest cotton, costing 40 cents, made into cotton lace, will bring \$1,000; iron ore, costing 75 cents, made into bar iron, will sell for \$5; horse shoes, \$10.50; table knives, \$180; the finest needles, \$6,800; shirt buttons, \$29,480; watch springs, \$200,000; hair springs, \$400,000; pallet arbors, \$2,577,595. Here labor has, with the aid of machinery, produced the difference between 75 cents and \$2,577,595. Any article obtained without labor has no exchangeable value. Rude labor, that which requires no practice or education, brings the lowest price; dexterous labor, which enables a person through practice to perform works or parts of works quickly and nicely, brings a higher price; and skilled labor, combining a knowledge of the principles underlying the operations, as well as dexterity in their execution, brings the highest price. Skilled labor creates values, rude labor often destroys them. The last stroke of the skilled sculptor gives value to the statue; one blow of the rude laborer might destroy the work of years. It is by labor that our machine-shops and iron-furnaces have been more productive of wealth to our State than would be the richest gold mines of the world. And if one-half of the 616,000 persons in our State engaged in agriculture, manufactures, and mechanical and mining industries should become *skilled* laborers, there would be an annual addition to our wealth of \$184,800,000. If there should be the same change in one-half of the 9,000,000 engaged in the same pursuits in our whole country, it would, at a very low estimate, add \$2,700,000,000 annually to the wealth of the nation. We must not overlook the fact that the sum required for necessary food and clothing, is the same for all classes of laborers. In England it has been computed that \$125 represents the cost of a highly skilled over an unskilled workman; and that this cost of a skilled workman is less than one year's purchase of his increased value to the nation.

A single fact will illustrate the value of skilled labor in producing the best machinery. A Pittsburgh cotton manufacturing company wanted a new Corliss steam engine to take the place of one they then had. The offer of one for \$8,500 was refused. A second offer, for the fuel saved in five years by the use of the new engine, disclosed the fact that the saving would be \$200 per month, or \$12,000 in five years. The engine was taken at the first offer. The saving from machinery running evenly, avoiding the breaking of threads, was probably equal to the saving of fuel.

Time will not permit us to do more than to allude to the vast losses arising from ignorant and incompetent workmen, engineers, architects, overseers, or owners of property. The abandoning on the ocean of the French steamship *L'Amérique* through the ignorance of the engineer; the building by our own government, at a

cost of \$11,000,000, of twenty light-draft monitors, not large enough to carry the turrets for which they were intended; the placing of an engine at the cost of nearly \$800,000, on one of our government ships, which was abandoned after a single voyage to San Domingo, in which the lives of many illustrious men were endangered; the Pemberton mills disaster, costing 150 lives and \$2,000,000; the falling of a floor in a Syracuse church, killing instantly 14, and injuring 100 more; these losses are familiar to all. Large sums and many lives are lost by incompetent railroad engineers and architects. Soils are exhausted, and small crops are gathered, through ignorance of the chemical and mechanical principles involved in agriculture. We are now taking annually nearly \$600,000,000 in value from the elements of our soil, and it has been said that we have taken more in value than the entire wealth of the country. Agriculture is fast becoming chemistry, and husbandry, machinery.

When men understand the theory as well as practice of their business, there will be less time and money wasted in futile attempts at inventions directly at variance with well-established laws. Inventions, of which we have many, as the 13,000 patents granted last year show, are generally the result of scientific knowledge. We have already placed England under obligations to our inventions to the amount of \$1,000,000,000. But the 7,000 rejected applications for patents last year prove, that there has been much misapplied time and ingenuity in this direction. We are almost daily reminded of the folly of the man who, by years of labor, sought to propel a boat by taking water into the bow and ejecting it from the stern. The \$20,000 lost in the vain attempt to collect the alcohol from bread in baking, and the efforts to construct electro-magnetic engines in the hope of superseding steam, are examples of the same kind. I have often been compelled to advise young men to abandon useless projects to which they had devoted years of patient toil and all their means. A knowledge of scientific principles would have saved them this loss. Science often comes to the rescue of ignorance, though sometimes at a late hour. The pretended discovery of diamonds in California was exposed by Clarence King, but not until innocent men had been defrauded of hundreds of thousands of dollars. The Nevada fraud was revealed to the public by a young scientist, saving \$1,000,000. A graduate of a scientific school, for a fee of \$250, showed the iron mixes of New York, in which hundreds of thousands of dollars were invested, to be valueless in consequence of containing titanium, thus saving \$400,000.

It must be remembered that what was economy fifty years ago, is gross wastefulness now, and what is economy now, will be regarded as reckless prodigality fifty years hence. From the waste of former years fortunes are now made. Less than forty years ago Dr. Buckland said: "We have during many years witnessed the disgraceful and almost incredible fact that more than 36,000,000 bushels, per annum, more than one third part of the best coals produced by the mines near Newcastle, have been condemned to wanton waste, on a fiery heap perpetually blazing near the mouth of almost every pit in that coal district." All the small coal was disposed of in this manner. Dr. Buckland said the inevitable consequence of this frightful waste would be to exhaust this coal field one third sooner than it would be exhausted if wisely economized, and to endanger the interests of the inhabitants who depend for existence on machinery kept in action by coal. England to day realizes the justice of this warning in her perilled manufactures. Carrying coals to Newcastle is no longer an absurdity. In this country it is now wisely proposed to consume all the coal dust.

J. Scott Russell, the builder of the Great Eastern, from his own experience, says: "The community at large are deprived of enormous treasures in mechanical inventions and enormous progress in scientific arts, by the fact of the general want of education in those who practise them. It may not be known, but it is yet true, that the mechanical power employed in all our manufactures is infinitely more costly than it need be. It is equally true that some skilled men know thoroughly how to produce immense economy in the production and use of mechanical power, but that we dare not put the means into the hands of uneducated masters under whose control they would be applied. I am not speaking of a loss of 5, 10, 20 or 30 per cent; I say that we know that we are only utilizing one-tenth to one-twentieth of the power we employ and waste, and that an economy of 100, 200, 300 and 400 per cent. is quite within our power, so soon as a better-informed, higher-skilled, more perfectly trained class of men and masters shall arise, who are fitted to be trusted with the use of instruments and tools, at present utterly beyond their comprehension, control, or application to use."

And again he says: "I find everywhere throughout the work of the railroads of the continent marks of that method, order, symmetry and absence of waste which arise from plans well thought out, the judicious application of principles, conscientious parsimony and a high feeling of professional responsibility."

Such practical and theoretical education as I am advocating, will save many of the losses arising from ignorance, or a want of habits of thought. Property and life will be preserved, the nation will be enriched, and the fierceness of the struggle between labor and capital will be diminished. What benefits the State benefits her citizens. Better educated and more skilled workmen command higher compensation, and higher compensation will enable the man to procure more comforts and luxuries, and to take a higher position among his fellows. A person educated in the common branches alone will usually earn twice the sum that an uneducated one will, and then his prospects are good for advancement to the position of overseer or manager, with, it may be, a salary of thousands, while the ignorant man has no such chance. A few years since, a director of one of the extensive cotton manufacturing corporations at Lowell, Mass., stated that only 45 out of 1200 operatives in their mills were unable to write their names, and that the wages of these were 27 per cent. In the same mills were 150 girls who had been teachers. Their wages were 17½ per cent, above the general average, and 40 per cent. above those who made their mark.

But it cannot fail to have been observed that a mere theoretical knowledge will not secure success in a profession or manufacture. To know that an experiment or operation can be performed, and to perform it, are quite different. We have seen many and grand failures, and large sums lost from this cause. The theory of navigation would not ensure a safe captain on the ocean. Many currents and their rates, many winds and their effects, and many peculiarities of his own ship, must be known.

Power to think, combined with a thorough practical knowledge of mechanics and the principles of science, will enable one to manage machinery skillfully, economizing labor, and increasing its effectiveness. Machinery everywhere is performing the most delicate and the most powerful operations, from the spinning of the slenderest thread to the making of the massive iron plate. It must be directed by intelligence and thought, and the greater the improvement in machinery, the greater the intelligence and skill required to manage it. To-day,

with the aid of machinery, one girl spins as much as did 3,000 of the sun-stained Hindoos centuries ago. It has been estimated that, at the present time, the laborers of Europe and the United States, with the aid of machinery, are doing four times the work that the whole population of the globe could do by direct labor.

Machinery in the varied Manufactures enables all, of whatever taste or strength, to find remunerative employment, which is essential to the prosperity of a nation. Agriculture calls for only a small part of the laborers, and those of well-developed muscles. Already our manufactures are many and varied, amounting annually to \$4,000,000,000, double our agricultural products. In our state, the value of our manufactures for 1870 was \$711,894,344, and our agricultural products were only \$183,946,027. In many articles we already equal or surpass other nations. Of seventy-six classes of articles manufactured in Birmingham, England, the Chairman of the Association of Commerce states that twenty-four are replaced in the common markets of the world by the United States. Our cut nails, sewing machines, pumps and edge tools are unsurpassed by those of any other nation. We have orders for table glass from Europe; our cotton fabrics are sent over the world; Bigelow's looms for weaving carpets are unrivaled. We have \$10,000,000 invested in the ceramic art in a single city, and have in our country every needed variety of clay for the most complete success in this large branch of industry. We are now filling a large order for locomotives for Russia. Our silk manufactures in 1872 reached the sum of \$25,000,000, affording remunerative employment to 11,713 men and women, while our importations of this article of luxury have fallen to \$24,000,000, a reduction of \$10,000,000 in three years. To affect contempt for an American silk now, is to betray ignorance of its value. We are taking annually from England 150,000 tons of tin at the exorbitant price of \$115,200,000, foolishly allowing her monopoly in this article, while possessing mines in our own country, and yet, to her astonishment, we send back tin-ware. By increasing our manufactures, we should stop so large importations of woolen goods as \$52,408,921 in 1872, and larger importations for other textiles, books, wares and numerous luxuries for which we pay annually many millions. These industries should be multiplied, and technical education will tend to this result, by giving us the skilled workmen needed for this work. The almost entire disappearance of the apprenticeship system, and the oppressive rules of Trades-Unions, make this education an imperative necessity. Our manufacturers would gladly listen to the entreaties of fathers and mothers to take their sons as apprentices, but they cannot.

The state must remedy this evil, or suffer our youth to become common laborers under foreign overseers. England until 1868 neglected this education, and so fell behind the continent, losing her position in the manufacture of many articles. The shawl trade of Leeds was absorbed by continental manufacturers by reason of their technical knowledge; the silk trade was injured by a superior skill in dye and finish on the continent; the designers, dyers and engravers in foreign countries, by possessing a thorough theoretical and practical knowledge of their several trades, produced greater purity and beauty of design, cleaner and brighter colors in the cloths and other fabrics they manufactured, finer patterns and greater lightness; Coventry ribbons were taken from her; foreign workmen were employed as painters and designers, and great deficiencies existed in those branches of knowledge which bear most intimately on the great departments of industry. Alarmed at these discoveries—that she was losing her supremacy in manufactures,

that French companies were building locomotives for an English railway, and that iron girders for a building in Glasgow were being constructed in Belgium, she at once established technical schools of a high order in the large cities, with others of a lower grade in the smaller towns. For a single department of the art school in South Kensington, £1,000,000 were expended, and £80,000 annually were given for its support by the state. In Queen's Institute, Belfast, Ireland, from 300 to 400 female students are trained in all branches of skilled labor, for which taste and physical fitness make them suitable.

In Europe these schools are many, and are supported wholly or in part by the State, on a scale, too, worthy the object. In 1869 there were 350 Technical Schools in Paris. Eleven thousand men receive a technical education annually in Prussia. From 10,000 to 12,000 workmen attend the lectures of the University in Berlin. Cruzot is a wonder of activity, skill and success from her systematic technical education. From the same cause, Switzerland, cut off from the sea and from mines, with her mountain climate, at every disadvantage, competes with the world in many of her manufactures. In our own country, Cooper Institute, Stevens Institute, The Worcester Free Institute, and the Institute of Technology in Boston, and many Colleges and Universities, are doing valuable service in this department.

That there should be some change in our course of education, conforming to the increased extent of the sciences and their numerous suplications, must be evident. What shall the change be? What reforms shall be introduced in our present studies, and what new studies shall be adopted? Time will permit me to make only a few suggestions in reply to these important questions.

The Primary School should give a knowledge of objects, their forms and colors and uses. In doing this, drawing will be found highly useful, and it will prove an agreeable change from studies less interesting. It is, too, the foundation of technical education, and is important to all of every trade and profession. By training the eye to keenness, and the hand to accuracy and rapidity, it will prove a valuable aid to penmanship, orthography and reading, in all of which close observation is necessary. In its higher forms, geometric, model, mechanical and architectural, it should be continued through the higher schools and colleges. It is not mere picture-drawing of which I speak, but something higher and most useful. As a result of this study, we shall have better artists, engineers, mechanics, architects, and designers. Many articles, such as glass-pottery, cabinet furniture, prints, and other manufactures, may be rendered worthless, or have their values increased manyfold according to their designs. Good designs increase the value of prints from 20 to 30 per cent. So important is this art of designing considered now, that a firm in New York pays a designer in shoes \$5,000 a year. By the beauty of his designs a manufacturer of silverware in Taunton, Mass., drove every other manufacturer out of the market. A single manufacturing company in Massachusetts stated that their designs cost them \$40,000 annually, every dollar of which went to England, France and Germany. This sum should be saved to our own country.

Workmen do not sufficiently understand the importance of drawing. It is said that if this art were understood by every journeyman in a machine shop, the productive efficiency would be increased 33 per cent. By enabling workmen to work from a design instead of expensive models, this art would save a vast amount of time and money. A manager of an important branch of industry at Worcester, Massachusetts, says that, when a lad, he was one of a class of thirteen, who spent all their leisure

time in studying drawing. At the present time, every one then in the class has attained an important position either as manufacturer or manager, and each has owed his power to seize the opportunity of advancement to his knowledge of drawing.

Massachusetts, ever alive to her educational and manufacturing interests, finding that she was far behind Europe in the education of her laborers, and that, as a consequence, her industries were suffering, adopted Drawing as one of the studies to be taught in all the public schools of the State, making it obligatory on every city containing over 10,000 inhabitants to furnish free instruction in this art to all over fifteen years of age. An Art Director was procured from Europe at a salary of \$5,000, and generous provisions were, in all respects, made. The result is most gratifying. In 1870, her product in printed cottons was over \$17,000,000, and her other manufactures in which design is of the first importance, were probably more. Massachusetts never made a better investment for her sons and daughters, and her manufacturing interests.

It is believed that this study can be introduced into our schools without interfering at all with the present lines of study. Familiar lectures, with illustrations on Geometry, Elementary Physics, Elementary Chemistry and Natural History should be given to all who are to leave school early. The amount of scientific information thus received, though it may be small, will lead the pupils to notice facts and to study principles in science throughout life. As the pupils advance, as far as practicable, models or drawings of machinery, or the machinery itself, and all processes of manufacture should be examined, and reports made with drawings explaining them, showing their excellencies or defects, and suggesting remedies. Special schools, or departments in existing schools, should be established where these branches may be thoroughly taught. As soon as it can be done, shops should be erected, where certain trades or parts of trades can be learned, where the hand and eye can be trained, and the student prepared for work or the management of works. Those who take a higher course in our schools and universities, should receive thorough instruction in all the science which relate to engineering, agriculture, the arts, trades and manufactures. It is my opinion, confirmed by many educators of experience and good judgment, that much of the time—years, it may be—now devoted to a few primary studies, reviewed so often that the process becomes mechanical, may be saved by commencing each study at the proper age, and omitting unnecessary portions of the text books. Occasionally, for a term, the study of arithmetic, geography or grammar, may be wholly omitted for some new and more interesting study relating to science or the arts. The experiments and illustrations will awaken mind, kindle enthusiasm, and many will be induced to prolong their attendance at school, who otherwise would not. By this course far more will be accomplished in a given time than now. It has been found that students who have spent but two hours per day in study, and the remaining hours in labour in which they felt an interest, have often made as much proficiency in their studies as those who have devoted their whole time to study.

Those whose course of study is to be limited to fourteen or sixteen years of age—and these compose by far the larger part of our students—should have a short, practical course, in accordance with such limited time. All, of whatever capacity or purpose, should *not* be compelled to pursue the same routine in the same time. This is the very objection brought so justly against the old collegiate system. Yet while that system in many colleges has been so much changed as to embrace numerous

district courses suited to the different students, and in addition, in one case at least, to offer more than forty optional studies, there has not been a corresponding change in most of our grammar and ward schools.

Our best authorities agree that our public school system, so well adapted to a former state of society, fails to meet the wants of our people in the present state of civilization. And while there is a demand to extend our course of education upwards so as to embrace all the science, let us seek to extend it downwards to the practical, the Kindergarten, in all our primary and grammar schools. What is demanded of the college, let the public school practice. A loss of two or three years to a student in our public schools, who has but a few years for study, is far more to him than the same number of years to the collegiate student, whose course may extend to his twenty-second or twenty-fifth year. Let not the student, fitted by capacity and taste to excel in some one branch of knowledge of art, be compelled to spend all his school years on studies, valuable, it is true, yet having no special bearing on his future pursuit, on which all his interest centres. A failure to arouse the mind of the student, and to communicate to him that knowledge which he may most need in life may be fatal to his whole future.

If a reform is needed, our educators should endeavor to effect it at once, so that there may be as little loss as possible. Let us not be "the last by whom the new is tried." A great work lies before us. Public opinion is to be formed, legislators are to be instructed and large expenditure to be made by the state or individuals. In a cause which will yield such large returns the state can afford to expend liberally.

Some special schools have already been established on a comparatively limited scale, and many of our colleges, where the change commenced in this country, have their scientific departments. The effects of these practical and theoretical technical schools wherever established, have been most marked, stimulating the intellect to activity, and diminishing the poverty, vice and crime of the community. And when we consider that eighty-two per cent. of the criminals of our country never learned any trade, never were masters of any skilled labor, and only six per cent. are skilled artisans and mechanics, the ethical value of this education becomes exceedingly important. The professions are crowded, and manufacturing and mechanical and agricultural pursuits are less honored than they should be. Our fathers and mothers should feel that a practical technical education is what most of their sons and daughters need. Our youth should be taught that there is true dignity in skilled manual labor, and that it will bring liberal pecuniary returns.

To woman, rapidly rising to her true position, to whom the avenues of trade, the professions, and all kinds of employment are opening, this subject appeals with peculiar force. She should have a deep interest in any measure which will render her less dependent on husband, brother or father, and which will enable her to obtain a generous support when other resources fail. She should seek to be in a condition to feel independent, and be able with ease to earn a livelihood. A knowledge of some art will tend to give her a higher position and to secure for her higher respect. From her knowledge of colors and their relations, and her skill in drawing, woman is fitted to succeed in whatever requires taste. The success of the lady pupils at South Kensington is greater than that of the male students, and that in the face of greater difficulties. The many branches of art workmanship requiring delicate fingers and native readiness of taste, can be better performed by woman than by man. In 1859, 20,000 women were employed in watch-making in Switzerland. Our silk manufactures employ

7,802 women in light clean, remunerative work. A lady in Pittsburg receives \$250 per month for designs in embroidery, made wholly by herself. Woman can excel in draughting, architectural drawing, photography, engraving, modeling, designing and painting. Education in the arts, by opening to her new departments of labor, will enable her better to compete with men, secure for her better compensation for her service, and will increase her usefulness and influence.

For the proper education of all our youth, with the least loss—the education that will best fit them for the duties of life, I plead. I do not, while speaking in behalf of practical learning, forget the moral and the religious training without which man will be a failure here and hereafter. The heart is more than the heart and eye—the future more than the present. Ability, power, may be used for evil instead of good, to curse or to bless. To others I must entrust this subject. I plead for useful learning in the school-room or the shop, or both, as a means of interesting our youth, giving them a taste for manual pursuits, so restraining them from idleness and crime; of enabling them to provide better for their own comfort and happiness, so increasing their self-respect and adding to the wealth and moral power of the state.

The effects of Technical Education in Europe lead us to believe that this system, commenced in the primary school, and continued through the different grades, would bring many of the 5,000,000 youth in our country of school age, who attend no school, under instruction, and make them industrious, moral, happy and skilled laborers, instead of paupers and criminals.

When plans for education in all its departments, for all shall be wisely devised and faithfully executed, we shall have better and more productive workmen, better citizens, thinking men and women, multiplied power of machinery economically used, the yield of our soil doubled, a more virtuous people, and our republic more prosperous and more safe. To us this great work is committed. Let us be faithful to our trust.

Preparations for the coming Transit of Venus.

The nature of a transit of one of the inferior planets (Mercury or Venus) is well understood, and the phenomena attending such a transit have been thoroughly discussed, and fully described in many places. The importance of the observation of these transits, and the general character of the results expected from the expeditions sent out to observe them, are probably understood by all, but it is thought that a brief account of the means that are to be employed to accomplish the desired end will be of interest.

The records of the plans which have been formed, and of the preparations which have been made by the different governments of the world and by private individuals, are, unfortunately for the general public, published only in manuscript. When the expeditions return home after the observations are made, in astronomical Europe and America will resound the busy hum of preparation, and from the beginning of 1875 the reader of astronomical items will be sated.

At first will come a series of preliminary reports as the parties come in; then we shall have the final reports, giving numbers, data, descriptions of instruments, and the observations made at the transit, the longitudes and latitudes of the various stations, and, in short, every result which the practical astronomer will have derived.

These final reports will be eagerly looked forward to, for upon them depends the constant of solar parallax.

and from them will be deduced the definitive result of all the astronomical work done on the globe on that day.

We know already that the final outcome of all these vast preparations which we are going to describe will be a number very near to 8"848.

The whole world is united in an effort to know exactly how to change this ; whether to write it greater or less. But the results of these expeditions, if they are successful (and we can hardly fail of success), will be, not simply the establishing of the earth's distance from the sun on a certain basis, but much more.

So many expeditions of trained scientific observers will bring back with them data only second in importance to the main object of their journeys. The latitude and longitude of many of the almost unknown islands of both oceans will be established with a certainty as great as the corresponding coördinates of most seaports on our own Atlantic coast. Observations for magnetic constants will be made at places widely separated, and much will be learned in this way. The line of Russian stations, and the American station in Siberia, will be connected by telegraphic wires to St. Petersburg, and possibly the stations in the Indian Ocean may likewise be joined with New-York or Washington, so that independent longitude determinations by telegraph may be extended over seven eighths of the globe.

Americans should not forget that our own Coast Survey has made three independent determinations of transatlantic longitude in the years 1867, 1870, and 1873, nor should they forget the wonderful agreement of the results obtained over three different cables, by different observers at different times. This agreement is so marvelous (considering the independence of the determinations), that the results are here quoted :

LONGITUDE OF HARVARD COLLEGE OBSERVATORY, WEST OF GREENWICH OBSERVATORY.

Campaign of 1867.....	4h	44m	31s00
Campaign of 1870.....	4	44	31.05
Campaign of 1873.....	4	44	30.99
Mean.....	4	44	31.01

It must be remembered also that, incidentally as it were, the relative longitude of Paris and Greenwich Observatories was found : so that it is to American astronomers, working by a method of American invention, that the exact value of so important a coördinate is due.

Americans will have reason to be proud if equally exact determinations can be extended by them from the Indian Ocean to New York, and from Siberia to Greenwich.

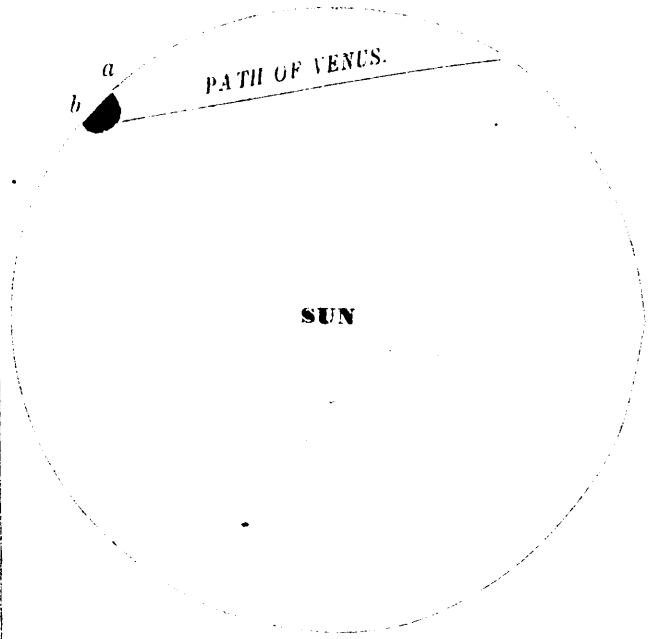
These are only some of the incidental advantages which it may be hoped will be gained by the various expeditions for which the different governments have provided.

There are various ways in which the observation of the transit of Venus may be made, and, in order to describe the instruments, and the preparations which are making, it will be necessary to refer to these briefly :

1. There is the *method of contacts*, which consists in determining the time at which the limb or edge of Venus's disk is tangent to the limb of the sun. To make this observation, a small equatorial telescope is needed, provided with suitable colored glasses to protect the observer's eye, and with the usual appurtenances.

2. The *micrometric method*, which consists in measuring the distance apart of the bright horns of that part of the edge of the sun which Venus partly obscures as she is moving on or off. As Venus has a sensible diameter (about one minute of arc), it will take a sensible time for her disk to move from *first contact* (when her disk just touches the disk of the sun *exteriorly*) to *second contact*

(when her disk is tangent *interiorly* to the sun's), and during this time the appearance of the two disks will be as in the figure :



This figure shows Venus coming on to the sun's disk, and it shows the two cusps at *a* and *b*. It will be easily seen that, if we know the length of the line *a b*, and the time at which it has this length, we can calculate the time of contact from these data. So that a number of measures of the cusps is the same as a number of first contacts. The reverse phenomenon occurs when Venus passes off the sun's disk.

To measure these distances, the equatorials must be provided with filar micrometers, i. e., with a contrivance by means of which two spider lines in the focus of the telescope may be moved toward or away from each other. One of these lines is to be placed at *a*, and the other at *b*; the time is to be noted, and the number of turns and parts of a turn of the screw which moves the lines is to be noted from the head of the screw, which is finely divided.

3. The *photographic method*. This consists in photographing the planet Venus on the disk of the sun, and noting the time of each photograph. The negatives are carefully preserved, and are measured subsequently by a fine measuring engine. It will be seen that this method is like the preceding, except that the measuring may be done at leisure, and without the hurry and anxiety which attach to any observation of this nature.

This method requires apparatus of a special kind. The American plan is to throw the image of the sun, with the planet on its disk, into a stationary photographic telescope where the negative is taken. This is taken out, and at once developed by the photographers, into whose dark room the telescope penetrates. This method is due to Prof. Winlock, of Harvard College Observatory. The other method consists in making the photographing telescope follow the sun in its motion by means of clock work, and in taking the negatives in the same way. The dark room, however, is some distance off, and it appears that too much dependence must be placed on the steadiness of the clock-work motion.

4. The *heliometric method*. This consists in measuring the cusps with a heliometer, which is merely a large

telescope which has two object glasses (or one object-glass cut into halves by a diametral cut) which slide past each other. Each half produces a complete image, the distance of the cusps may be had.

5. The *spectroscopic method*. In brief, we may explain this as follows: It is known that there is a thin layer of atmosphere near the sun's limb where bright lines may be seen with a powerful spectroscope, while on either side of this layer dark lines only are seen. As Venus advances, the interposition of her dark body will cut off this layer, and the instant of disappearance of the last vestige of any one of these bright lines will be truly the instant of first contact.

The ordinary method of observing first contact is open to grave uncertainties (on account of the different sensitiveness of the eyes of various observers, and for other reasons), and it is hoped that this method, as beautiful in theory as it will be difficult and delicate in practice, will obviate all these objections.

It is to be expected that the astronomers of the different nations will adopt different plans of observations, in accordance with the peculiar traditions of each school.

The Germans and Russians, among whom the use of heliometers has been hitherto confined, will (with a single exception) alone use them on the approaching transit.

The German Government will send one of these instruments to the Kerguelen Islands, or to Macdonald Island, one to the Auckland Islands, one to the Mauritius, and one to China (Chefoo). Lord Lindsay, of England (the one exception spoken of), also takes a heliometer with his very completely-equipped private expedition to the Mauritius.

Three of the twenty-seven Russian stations in Russia, Siberia, China, and Japan, will be provided with heliometers; at three, likewise, will the photo heliograph be used, while the remainder of the stations will be devoted to the ordinary contact observations and to measures of cusps.

At all the American stations the photo heliograph, the contact method, and the method of cusps, will be used. The American stations will be eight in number. These will be principally in the southern latitudes, in the Indian and Pacific Oceans, except one in Siberia, and, perhaps, a photographic station in the Sandwich Islands.

Stations in Japan and China will be established also by the Americans.

Most of the English parties are to be in northern stations, though the Challenger exploring expedition is instructed to examine eligible stations in the South Pacific. Of the stations of French observers little is definitely known, although they will occupy a few posts.

Each party must be provided with instruments to observe the actual transit, and it must further have the means of determining accurately *time*, *longitude* and *latitude*.

Of these *quæsitæ*, the latitude and the local time are most easily determined. Portable transit instruments will suffice for the first determination, and for the second there are various adequate means.

The American parties are each to be provided with a small portable transit instrument and zenith-telescope combined, which instruments are now making by Stackpole, of New York.

These are intended to be of the simplest possible construction and of the greatest attainable stability, and they combine several advantages. In accordance with a suggestion first proposed by Steinheil, of Munich, the tube proper of the telescope will be reduced to one half of the usual length. A prism will be placed at the end of the tube opposite the object-glass, by which the

rays which enter the telescope will be turned at right angles through the perforated axis of the pivots of the instrument, thus utilizing the necessary length of this axis by making it an integral part of the telescope.

The observer will thus occupy one position, no matter to what part of the meridian his telescope is pointed, which is, in itself, a great advantage, on the score of convenience. This also will doubtless conduce to a constant personal equation, as it has been shown by the director of the Albany Observatory, and others, that personal equations vary with the altitude of the observed star.

These instruments are provided with fine spirit-levels and with micrometers, which fit them to be used as zenith-telescopes, and thus to determine two of the three important *quæsitæ*.

The parties of other nations will use similar methods for this purpose. The coördinate which is most difficult of exact determination is the longitude, and the problem of its determination will be attacked in various ways.

The English parties, true to the traditions of Greenwich, are to be provided with portable altitude and azimuth instruments with which to observe moon transits, both in the meridian and out of it. A long series of such moon culminations was observed between Harvard College Observatory and Greenwich some years ago, and it is known that the result obtained was greatly in error. Indeed, Prof. Peirce, in his discussion of the series of observations, came to the conclusion that it was impossible to derive the longitude of a place by this means, *certainly*, within one second of time.

The Americans and Russians intend to depend on the occultations of small stars by the moon.

Occultations are much more likely to be free from systematic errors than the moon-culminations, and, if they can be observed throughout a lunation, a compensation of errors will obtain.

The Russians intend to mask their stations of observation, and subsequently to connect by telegraph St. Petersburg with the most important of them. The transportation of chronometers to and from between the stations whose longitude is thus determined and the minor ones will assure the longitude of the latter.

The American parties in the southern seas will be transported to their various stations in a ship-of-war which will touch at the different islands and leave the parties, and which will make chronometric expeditions between the various stations. Besides this, all existing telegraph lines will be utilized. As each of the parties of each nation is to be led by some astronomer of eminence, it is certain that no means will be neglected to make the preliminary results of the greatest attainable accuracy.

The various assistants are now in training at Greenwich, Poltava, and Washington, with the very instruments which they will use on the expeditions.

At Washington and Poltava an apparatus for the representation of the transit is in use. A disk representing Venus is caused to travel over an illuminated space which is representative of the sun, and the circumstances of the transit are then observed.

In this way it is hoped to obtain an idea of the personal error of each observer in watching contacts, so that, in reducing the observations of the transit, all personality may be eliminated.

Most of the American parties will start in the spring of 1874, and proceed in the most expeditious way to their stations. They must take with them *every thing* which they can need during their stay, for in most of the stations there is no supply of any kind to draw upon.

We can hardly realize the absolute necessity of being

provided with every thing that *may be* needed on such an expedition : but let us conceive the feelings of an astronomer on a desert island with no screw driver, or with no ink, or matches, or soap !

There is no repairing a blunder of outfitting in these cases, and the greatest care has to be exercised in providing for all contingencies.

Arrived at its station the party will put up its observatory, a little wooden or canvas hut which has been brought from America, for no wood grows on *this* island. The instruments must next be mounted, and all gotten in readiness for work.

The astronomer and his assistant set up the transit, the small equatorial (five inches' aperture, and about seven feet long), and the clock, and provide safe places for their chronograph and chronometers. Suppose a chronometer-spring breaks now : there is no help nearer than New York. The two photographers put up their hut and prepare for work. From this time until the time of the transit, *all* is work.

Every day the methods which will be adopted on the important day are rehearsed. Each one does the very thing which he will do, takes the very steps which he must then take, and turns the very same micrometer-screws just as he will turn them in December. This is repeated until every one is sick of it, and, from a man, each becomes a machine.

During the nights the chief astronomer is looking for occultations, or taking differential measures between the moon's limb and a star, while the assistant is determining time and latitude. Sometimes their work is interchanged, to eliminate any personal peculiarities of observing. When the final day comes, they should have their latitude and longitude thoroughly well known, and their clocks and chronometers rated perfectly. The photographers, too, should know the exact strength of both, the precise time of exposure, and the right developer to make the best possible negative of the sun.

When the time of transit actually comes, the chief will be at the equatorial, and will observe the first contact, and record the time on his chronograph, and at once commence measures of the distance of cusps. The assistant astronomer will see that the heliostat which is to throw the image of the sun into the stationary photographic telescope does this properly ; and within the dark room the two photographers must be taking negatives as rapidly as possible.

This continues during the transit from first to second contacts ; afterward the photographs succeed each other, but not so rapidly, and finally, the last contact is marked. It is all over now, and there is nothing to do but to write down at once all notes which are to be used in the report, and to prepare for a journey home.

Six or eight months on a rocky island, vast expense, and much trouble and discomfort : but *le jeu vaut la chandelle*. The moral of it is, that Science expects every man to do his duty. Let us hope that Science will not be disappointed.—*The Popular Science Monthly*.

Annual meeting of the Provincial Association of Protestant Teachers.

According to previous announcement, the Association commenced its eleventh annual meeting at Granby on the evening of Thursday, Oct. 29. The afternoon train from Montreal, which arrived at Granby at 6.30 p. m. brought a considerable number of teachers, and others interested in the promotion of education, and the evening was devoted to the holding of a general meeting which

was attended by a large number of the residents of Granby and the vicinity.

On the platform were M. Lynch, M. P. P., President of the Association, Mr. F. Hicks, Secretary, Dr. Miles of the Education Department, the Hon. Mr. Irvine, Mr. Justice Dunkin, the Rev. M. Watson, Ex President of the Association, Mr. Hossack, Chairman of Quebec Protestant School Commissioners, Principal Hicks of the McGill Normal School, and several other gentlemen. The Hall in which the meeting was held was crowded to excess. Quebec was well represented, for in addition to the Chairman of our city School Commissioners, there were present several of the principals of our public schools and some of the assistant teachers.

The president called upon the Rev. M. Watson to open proceedings with prayer, after which he proceeded to deliver the customary annual address. Mr. Lynch stated that though labouring under the effects of illness which almost incapacitated him from performing the duties of his office, he felt that he could not shirk those duties on this occasion. There were, he said, many present who from their experience in educational matters in this Province, were better able than he was to fill the position he occupied. Nevertheless he felt and had always felt the greatest interest in the objects of the Association, which he succinctly explained. He stated from conviction that a thorough reform was called for in the management of educational affairs in this Province as respected the minority and Protestant education ; that the so called High Schools, Academies, and other institutions deriving aid from the public funds for the support of superior education were altogether too numerous, and that their dependence upon mere political influence for their establishment and maintenance was a thing which ought not to be longer perpetuated, in the interest of Protestant education. He asserted that these institutions were much less efficient and much less numerously attended now than they used to be 20 years ago, and that the salaries paid to the teachers were totally inadequate. He then adverted to the Common Schools, and said that the retention of the ancient system of *boarding round*, and miserable remuneration of the instructors was disgraceful and far behind the requirements of the day. He disclaimed all idea of making political capital out of the facts of the case, and that he simply advocated, as he had always done before, the application of common sense principles to the management of the most important and most vital interests of the community as respected their Protestant fellow subjects and citizens on whose behalf the Association had been established. He said that the teachers themselves, and the public, had the remedy in their own hands, and invited all present, especially those engaged in the practical business of education, to attend and take part in the discussion of the topics which would come under consideration during the course of the present annual meeting.

The President's able address was listened to attentively, and elicited frequent rounds of applause.

The President, at the conclusion of his address, called upon Dr. Miles, the Protestant Secretary of the Education Department.

Dr. Miles said, that in coming forward, he should not wish it to be understood that he was about to deliver a formal address to the meeting, which he was sure would be more gratified to listen to remarks from some of the distinguished persons then on the platform ; that he had not prepared any paper or regular address not having had the opportunity of doing so since he received the invitation to attend this meeting. He had nevertheless given his attention to some of the subjects of discussion which were announced on the programme, and more

particularly to that which related to the superannuation of teachers, and that he was ready, when the proper time should come, to offer some remarks and suggestions upon that important topic. He understood the call of the President at this early stage of the proceedings to be intended merely to afford him the opportunity of discharging a duty with which he had been entrusted by the Hon. Minister of Public Instruction, which was to state, on his behalf, the regret he felt at not being able to personally attend the meeting in consequence of public business which detained him at the capital of the Province. Dr. Miles then said that the Minister had desired him to express his sympathy with all the public school teachers in regard to their important and arduous duties that he was assured the grand object of the Association was the advancement of the education of the people upon which the prosperity of the whole community so much depended in the future. We had within the past few years three successive Ministers, the Hon. Mr. Chauveau, the Hon. Mr. Ouimet, and now the Hon. Mr. deBoucherville, who had in similar terms expressed their sympathy with the Protestant teachers of the youth of the Province, and their sincere desire that public education might benefit by their efforts. Dr. Miles concluded his remarks by adverting to the gratification he felt at being again present to meet the teachers at the annual convention.

The President then called upon Mr. Justice Dunkin and the Hon. Mr. Irvine in succession, to address the meeting.

The Hon. Judge made an able address, in the course of which he pointed out the difficulties which had beset the process of establishing a practicable system of public education among the people scattered over an immense territory and differing in creed and language. While concurring generally in the observations of President Lynch, he was not in favor of sudden and radical changes, which, however necessary and desirable when regarded from a theoretical point of view, should be made gradually. In one thing he did not concur in the views stated by the President, namely, that practical teachers alone should be chosen to preside over and conduct the affairs of the association; and he adverted to the fact that nearly every person then on the platform had in time past been practically engaged in educational work, and had subsequently continued to exert themselves in the advancement of education.

The Hon. Mr. Irvine then briefly and happily addressed the meeting, and, like Judge Dunkin, was listened to with marked attention and greeted with frequent bursts of applause. He said he had come to attend the convention more as a listener to the discussions that might ensue than as one who felt competent, from familiarity with educational matters, to offer useful suggestions; and that he desired by his presence to manifest his sympathy with the teachers' work, and his intention to turn to account, in the future, whatever information he might acquire concerning details that the discussions would bring into view. He also concurred generally in the sentiments which had been expressed by the President and by Judge Dunkin.

Mr. Principal Hicks was next called on to speak. He said that as his name had not appeared in the printed programme for an address, he had not contemplated saying anything at the opening session of the convention. He had listened with attention to the President's able speech, and to what had been said by Dr. Miles, and by the Hon. Messrs. Irvine and Dunkin. He claimed for practical teachers the credit of having initiated all or nearly all that had been done in the way of essentially improving public education, and that teachers themselves were the fittest persons to conduct the affairs of an

association of teachers like the one which was now holding its annual convention. He considered that teachers generally were more backward than they ought to be in giving their views on important educational topics, and exhorted those present to freely express their sentiments on the various questions to be discussed. He instanced the introduction of the monitorial system in England by Lancaster, and its general adoption from small beginnings made in London more than fifty years ago, and stated that his was only one example of several that could be given to corroborate the truth of what he had advanced.

The worthy Principal of the Normal School was heartily greeted when he referred to his own long experience in connection with the progress of public education in this Province.

In the intervals between the foregoing addresses, Mr. Andrews, the elocutionist, favoured the audience with select readings which were most effectively given and created much amusement.

The Thursday's session was concluded with an announcement, from the chair, of the routine to be followed in next day's proceedings, and, after prayer by the Rev. Mr. Jones, an adjournment was declared till the morrow.

The following is the list of subjects of discussion given in the printed programme:

Morning Session—9.30 a. m.

Paper on "Kindergartens." By Mrs. Scott, Montreal; Paper on "Teaching Free Hand Drawing and Designing." Mr. R. Weir, Montreal; Paper on "School Discipline," Mr. Inspector McLaughlin, Sweet'sburgh; Paper on "Physical Education," M. Duval, Montreal.

Afternoon Session—1.30 p. m.

Election of Officers; Choosing place for holding next Meeting; Remarks on Teachers' Superannuation Fund, Dr. Miles, Quebec; Paper on "Attention, and How to Secure it," Rev. Dr. McVicar, Montreal, Paper on "McVicar's Method of Teaching Arithmetic," Mr. W. E. Jordan Montreal; Paper "The Text Books in Use," Mr. H. Butler, Bedford.

Evening Session—7 p. m.

A general discussion of the Education Bill recently submitted by the late Minister of Public Instruction, Hon. G. Ouimet.

SECOND DAY—MORNING SESSION.

Rev. Mr. Nighswander, Congregational Minister of Granby, having opened the meeting with prayer, it was unanimously agreed that the minutes of last annual meeting be adopted without being read.

Mr. W. E. Jordan then read a paper on teaching arithmetic with the aid of Dr. Malcolm Mac Vicar, Ph. D., LL. D, Principal of the State Normal School of Potsdam, N. Y., describing his example frame, its advantages and how to use it.

Want of space prevents us from giving the whole of the speech, which was very ably delivered. In conclusion, he stated the cost of the frames, cards, and all the requirements, was \$23, and the School Commissioners of Montreal had decided to introduce them into all the schools under their control. He exemplified the different modes of procedure, with a class of 20 pupils from the Granby Academy, who did great credit to their teacher (Mr MacIntosh).

Principal Hicks remarked that there was danger of the teacher becoming slothful, by having so much of his work done to his hand; also that the pupils would learn

to make figures more readily by seeing the teacher make them instead of seeing them on printed cards. He would recommend the frequent use of the black-board, even were this method adopted in the schools.

Mr. Justice Dunkin remarked that if the teacher were a poor writer (a not uncommon thing), it would not be for the pupil's advantage to copy his figures.

After remarks from several other speakers, it was resolved that the Chairman appoint a committee to prepare a resolution to be submitted for the approval of the Association as their deliverance regarding this system of Arithmetic. The Chairman announced that he would appoint a committee in the afternoon.

He was followed by Mrs. Scott, of Montreal, who delivered a paper on the system of education pursued in the German Kindergarten, explaining how children were taught by means of cubes, balls and squares, which attracted their sight. The system was an old one, and had been recommended by Plato although the system was introduced by Fröbel. The lady's interesting explanation was received with loud applause.

The Chairman next called on

Mr. R. Weir to read his paper on "Teaching Free-hand Drawing." Mr. Weir said that there were three classes of individuals who practised drawing. 1st, Those who got direct and practical results from their drawings; 2nd, those who practise it on account of the training it gives in preparing for other pursuits, and 3rd, those who draw for the pleasure they derive from it. Special ability is not necessary for the teaching of drawing nor for attaining a good proficiency in the art itself. He then illustrated the mode of teaching drawing from nine points and also from twenty-five points, and remarked that mere copying was not drawing. He showed the absurdity of setting children to drawing pictures where lights and shades were required, as this required a good deal of judgment for its proper performance.

Rev. T. W. Fyles, of Cowansville, made a few remarks on the subject, and also exhibited the various processes often used by beginners in drawing.

The Convention then adjourned to half past one.

AFTERNOON SESSION.

The work of the convention was resumed about two o'clock, when a resolution was unanimously passed expressing the Association's approval of Dr. Mac Vicar's example frame as a most valuable aid in teaching arithmetic and recommending its general use by teachers.

Dr. Baker Edwards called the attention of teachers to the facilities for teaching Chemistry in schools afforded by the sets of apparatus put up by the "Canadian School Apparatus Manufacturing Company of Toronto," of which boxes were exhibited. There were—1st. The "Boys' Own Laboratory," price \$1.50, consisting of fifty-five neatly labelled Chemical preparations and pieces of apparatus, in a wooden box, together with book of instructions to perform 120 experiments, illustrative of Chemical union, and the phenomena which accompany it, including changes of colour, form, and volume, with the evolution of light, heat and electricity. 2ndly. "The Cabinet of Chemical Wonders, or Parlor Magic," with instructions to perform over seventy amusing, instructive, and useful experiments, price \$3, containing 15 bottles and 12 boxes of Chemicals, also spirit lamp, glass tube, test tube, test tube holder, and test tube cleaner; and lastly he described a set about to be issued by the same Company, called "The Chemical Object Lesson Cabinet," price \$6, including 125 Chemicals and pieces of Chemical Apparatus, to illustrate a series of Chemical Object Lessons, prepared by Dr. Baker Edwards himself for

the use of schools, with accompanying book of instructions. The plan of these lessons is to provide the teacher with every requisite for experimenting on the leading metallic and non-metallic elements, comprising: 1st. The Object. 2nd. Experimental Chemical Changes. 3rd. Its use and Appliances. 4th. Examples of its Compounds. The subjects comprised in these lessons are as follows:—1st, hydrogen; 2nd, salt and soap making metals; 3rd, cement and mortar metals; 4th, brick and pottery metals; 5th, hardware metals; 6th, paint and color metals; 7th, galvanic metals; 8th, quicksilver; 9th, noble metals; 10th, alloys and amalgams; 11th, oxygen; 12th, borax; 13th, glass; 14th, sulphur; 15th, chlorine; 16th, phosphorus; 17th, nitric acid; 18th, carbon; 19th, organic bodies; 20th, flame. Each lesson will occupy about half an hour, and such experiments only are selected as are perfectly safe, and easily performed by a careful teacher. The course will be found an excellent elementary ground work, preparatory to more systematic lectures and within the intelligence of intermediate as well as senior classes in public schools. These will be sold by Messrs. Dawson Bros., sole agents for the Province of Quebec. Dr. Edwards then proceeded to illustrate one or two of the lessons, showing that while the experiments selected are brilliant and striking, they are not of a dangerous or complicated character. The 3rd, 5th and 20th lesson were thus illustrated, and the experiments excited considerable interest, and were warmly received. Dr. Edwards stated that the School Commissioners of Montreal had adopted these lessons and were about to introduce them in the city schools. The Commissioners also warmly recommended "The Boys' Laboratory." They would also be used in the Model and Normal Schools. A resolution was then passed approving of the use of these chemical object lessons, and recommending their use in schools.

After Dr. B. Edwards had concluded his experiments, it was moved that the Association should meet in Quebec next year.

Dr. Miles said he had heard it alleged sometimes that Quebec was less progressive than Montreal and some other places in Educational matters. In fact, he believed it to be somewhat in fashion to underrate the old city as to other matters as well as education. However that might be, several of the teachers of Quebec, and other persons interested in Protestant Education, had requested him to promote the proposal for the Association to hold its next annual meeting there. He thought it would be good to do so, and Quebec being a place easy to be reached, and for other reasons not necessary to be explained in detail, he had much pleasure in seconding the motion, which, on being put to the meeting, was carried unanimously.

Hon. Judge Dunkin suggested to take three or even four days next year. Their meeting this time had been too short.

W. W. Lynch, Esq., M. P. P., the Chairman, stated in answer to a question put to him by Mr. Jordan, that in his opinion every friend of Protestant education should be a member of the Association, and that that should be sufficient to constitute membership.

The election of officers was then proceeded with and the Rev. Dr. Cook of Quebec was chosen President of the Association for the ensuing year.

Mr. Frank Hicks was then re-elected Secretary and Professor McGregor, Treasurer by acclamation.

Mr. Hobart Butler, M. A., President of the District of Bedford Association, then read the following paper:—

At our last annual meeting our common schools were the subject of one sided diatribes, which were somewhat uncomplimentary to the system of teaching that most generally prevails throughout the country—the condem-

nation was too sweeping. A good deal of truth and somewhat of fiction found utterance then, owing to the natural bent of the human mind to go to extremes—to “condemn with faint praise,” because our fellows did so. No one was prepared to defend them then. It is a fact that some of our schools are not up to the desired standard; yet the greater number are worthy of praise and imitation even in system, thoroughness of instruction and government. And the teachers of them have received their instruction in the country schools wholly. I have in mind large numbers of both male and female, who owe their positions to the mental culture and training received in country schools. They are mingling in all the walks of life with great credit to themselves, with honor to the circles in which they move, and with a certain degree of renown upon the country. These remarks are called forth by the remembrance of impressions produced a year since, when apparently nothing was of account unless it “came from Denmark.”—and a “Dane brought it to us.” It is admitted that our common schools are not perfect in the training which they afford. It is our province to seek for the causes, and, when found, to advocate their removal, and the substitution of a superior means.

We have the teacher the scholar, and the money to bring them together, all these conditions were given in the discussions of last year. We found them each full of all faults—the teacher received his portion—and the scholar, innocent victim, his; the School Commissioners and the electors came in for their share, and the people, parents or not, whether they were directly interested in the schools or not, did not escape censure for some fault. This was well in case all deserved the blame heaped on them.

But the great source of the failure, of our system of education, if it is a failure, did not receive even a passing notice. We talked around, above, below, and about difficulties, and with apparent wisdom resolved that nothing which we have come from “away from home,” “foreign parts,” so all was bad, defective, wrong. Now, our text books nearly all came from “foreign parts;” they are imported for us, and are often the discarded books of other progressive peoples. They should have received a measure of criticism at our hands. Let us condemn them in an emphatic, unmistakable manner, and thus relieve ourselves of their presence in our schools. It cannot be claimed for them that they are models, the *non parvils* in excellence—they are very defective—do not meet the wants of the young and impressionable minds of the times—they have not kept pace with modern improvements—they are the books of days long gone by. They lack in attraction, and their lack of external beauty goes deeper than covers; they are a failure, from having nothing beautiful to the young mind in them. “Undoubtedly they came from Denmark,” says one. The reading books are filled with unpronounceable, undefined, misspelled words. All the technical terms and professional names in the vocabulary in the arts and sciences have place in consecutive sentences. Such are among the many objections raised against them. One of them reads as follows:—“The posteriority of the formation of the unstratified rocks to the strata is thus made evident from their relative positions; their forcible ejection from below is equally proved by the penetration of their veins or shoots into the superincumbent strata in an upward direction, often with the most slender ramifications to a great distance.” Only a trained geologist can be interested in the above extract. Only a thorough classical scholar can read it understandingly. It is mockery to place it in the hands of the young for a reading lesson. A reading book composed of treatises upon the sciences

geology, philosophy, etc., is wholly unfit to interest the young mind. Unless interest and a continued attraction are disclosed throughout the treatise or essay, and the whole treatment of his subject by the author involuntarily attracts as though visibly drawing attention, no progress whatever can be made in development or growth. Bare facts are repulsive to the young. A dictionary would be as useful as a reading book. Column upon column of families of words committed to memory serve often as a corrective to a disobedient scholar, but reading is not taught by that exercise. With the reading books most common in our schools we have only miserable failure, not even poor apologies for readers. We have as the result of a course in them oftentimes the wordy parrot, the talking machine, delivering itself in monotonous, meaningless tones, with an entire absence of thought or sense. Reading is only talking, repeating the ideas of one person to another. The reader is simply personating the author, he gives expression to the author's ideas as the latter would do were he present and conversing. The conversationalist by his animation interests by his feeling in the subject, his belief in the truth of it expressing itself in the unconscious motion of the hand, the involuntary glance of the eye, and the beaming countenance generally. What enthusiasm for a young mind can spring from treatises upon machines, chemistry, physiology, anatomy, optics? You might as well tell me that an apothecary can arouse enthusiasm in his listeners by enumerating the vile drugs piled away upon the shelves of his shop; or a doctor by repeating alphabetically the catalogue of names of bones composing the human frame: interest can not be forced, only as the subject matter draws it out and calls it into active exercise. As a contrast to the extract from a lesson book, I take from another work; “But if you would hear one of nature's most various and delicate harmonies, lie down in the edge of the woods when the evening breeze begins to stir, and listen to its coming. It touches first the silver foliage of the birch, and its slightly hung leaves, at its merest breath will lift and rustle like a thousand tiny wings; and then it creeps up to the tall fir, and the pine tassels send out a sound like a low whisper; and as the oak feels its influence, the thick leaves stir heavily, and a deep tone comes sullenly out like the echo of a far-off bassoon. They are wind-harps of a different power; and as the breeze strengthens and sweeps equally over them all, their united harmony has a wonderful grandeur and beauty.” What teacher, when his class of scholars has read “Willis' Unwritten Music,” from which the above is an extract, has not seen the bright eye of the little boy or girl light up, the countenance beam with pleasure, and heard one child whisper to another, “I heard it last night in the edge of our woods,” and the reply, “I will listen for its coming to night.” Again Willis' says: “There is something exceedingly impressive in the breaking in of church bells on the stillness of the Sabbath. I doubt whether it is more so in the heart of a populous city than any where else. The presence of any single strong feeling, in the midst of a great people, has something of awfulness in it, which exceeds even the impressiveness of nature's breathless Sabbath. I know few things more imposing than to walk the streets of a city when the peals of the early bells is just beginning. The deserted pavements, the closed windows of the places of business, the decent gravity of the solitary passenger, and, over all, the feeling in your own bosom that the fear of God is brooding like a shadow over the thousand human beings who are sitting still in their dwellings around you, were enough, if there were no other circumstances to hush the heart into a religious fear. But when the bells peel out suddenly with a summons to the

Temple of God, and their echoes roll on through the desolate streets and are answered by the sound of any human voice, or the din of any human occupation, the effect has sometimes seemed to me more solemn than the near thunder. Far more beautiful, and perhaps, quite as salutary as a religious influence, is the sound of a distant Sabbath bell in the country. It comes floating over the hills like the going abroad of the spirit; and as the leaves stir with its vibrations, and the drops of dew tremble in the cups of flowers, you could almost believe that there was a Sabbath in nature, and that the dumb works of God render visible worship for His goodness." In these extracts there is a deep interest for any human mind, whatever may be its maturity, consequently the beauties are brought out by the reader without any effort on his part; he himself is interested, hence his hearers are interested and insensibly but irresistibly are led along by him.

Youth is the bright period of life, when, free from care, the hard realities of life being unknown, the mind, tender and impressionable in a wonderful degree, should be made to see but the bright side, and should be brought into contact with the joyous and cheerful, the lively and pleasant only. Once a week he has the terrors and penalties of an evil course instilled into his mind in another school; he occasionally hears funeral orations, and minor tunes sung in low keys, enough to keep the fact on his mind that all things are not joys; the other six days of the seven should be ones of pleasant labor at school with a kind teacher, attractive reading books, filled with lively dialogues so as to cultivate the conversational element, interesting historical sketches, enthusiastic orations, pleasant narratives and select essays, not above the comprehension of the young mind. Because primitive people three hundred years ago or less were lugubrious in their intercourse, took pleasure in psalm-singing only, used knock down arguments in governing schools, brought heavy artillery into requisition to drive into the mind simple facts, used the Eton grammar seven years preparing an intelligent lad for the College, and the Upper Canadian Series of Readers in common Schools; there is no reason why kindness to day will not govern a school, why the text books named should not be placed upon the antiquary's shelf among the curiosities of by-gone days, not forgetting Lovell's geographies, Lennies grammar, and many other books. Do not misunderstand me; it is not pretended by me that there are not facts sufficient in those books. The trouble is there are so many fact-cold, hard material facts—unrelieved by fancy's flowers or other interesting matter, presented to the mind in such ways that only the ripe scholar can read them with profit. The young mind is disgusted with them at first sight, just as at a nauseous drug. Time and circumstances never make the drug palatable—riper years, a disciplined mind, and a special direction of it make the books of use as a reference to prove. As text books, they are better however than no books at all; but they do not accomplish the work proposed by them nor can they, no more than you can draw out Leviathan with a hook, or grow a cedar of Lebanon in a lady's flower pot. There are developments being made in everything the world over, in all countries. New thoughts upon old subjects, new ideas in all departments of learning are continually springing into existence. New adaptations to old methods, to changed forms and necessities are sought for by the investigating. As Virgil says: "The times are changing, and we change with them." That is generally true of to day. The old as a consequence are going out, becoming obsolete. Yet, our Council of Public Instruction clings with tenacity to the old system, the old books. They know of no other than to follow in the beaten paths of their

fathers: what was good for the father's mind will suffice for the son's. They are forgetful that while they have been enjoying their long sleep the educational mind has been moving on. Clinging to their ancient idols, they are more conservative than their *confreres* in the political world. The latter take departures from the old, honest way. (Since our last meeting we have had results from two new departures in the political world—the Pacific scandal and that of the Tanneries land swap.) The parallel however, does not hold good further. In education we believe in trying the untried, in making experiments with new books new principles of government, new agents to the one great end, that of education and disciplining the young mind so that the great amount of thorough culture may be arrived at in the shortest time by the readiest means and least expense to the greater number—all for the ultimate good of the great whole. It is not desirable that our text books should so educate that only the learned can understand and derive profit from them; that would be educating in a wrong direction for an unworthy end. The best reader the best speaker, is he whom the illiterate can comprehend. His language is simple, plain, pure Anglo-Saxon, expressed in a perfectly natural way, without effort, tone or affectation; the latter are unpardonable faults; they are devices only of the unlearned. The labored reader, he who perspires in the delivery of a simple sentence, embarrasses himself and disgusts his hearers. He who throws into the usual "How do you do, sir?" all the genuflections and gestures of a tragic stageplayer, forgets that temperance should beget his acting and makes himself simply ridiculous: To become a good reader requires rules not too comprehensive in a few, nor so few as not to present to the learner the whole points in the art. In either case, as a result of his teaching, he is too tame to interest his hearers.

Such readers our series of Reading books produces, and the ear of a listener wearies of the sound of the reading, as though his tone had been pitched with a tuning-fork or some musical instrument and held to the weary end. But where no rules are given as guides, there is lack of confidence, and the sound of his own voice frightens the young reader, and his work cannot, therefore, be well done. All schools cannot have a Professor Andrews to teach elocution, even if it were desirable to have one. Nor is it necessary that all readers become elocutionists. But we desire to make good readers of all our scholars—readers who while reading, at a glance at a new piece can see clearly the spirit running through it, and give it expression in such manner and tone as to interest those who may listen. Have we text books upon the subject adapted to his end? Decidedly not. And we have no spelling books, no grammars,—we might as well be without a geography as to depend entirely upon Lovell's series. Sangster seeks to make arithmetic difficult instead of simplifying it; yet his are the least objectionable of all our text books. There is less objection to the works upon the higher branches of education. Some even are unexceptionable; but the use of them is limited; Here our teachers are at fault, not for not doing their duty with the books given them; but for not doing their whole duty. They cling to their idols—their first love; those idols are the books of their childhood. The true teacher should at all times recognize the good points of every school book—in so far as its design is directed and adapted to a special end; and to every practicable extent give it a place in his school. He should make himself familiar with all new school books—glean from them the secrets, new and old, as they come from the press. Compare authors. There is more gained in a few moments in this way than in months of diligent

study of our favorites. By this means he himself becomes master of the subject he teaches. And before his classes he requires no particular author as a guide for him in instructing. His labor is increased by this course it is true, but if he is in love with his occupation, the additional labor sits light upon him. There is a remedy for this serious lack of suitable text books. We can become the compilers and publishers of our own school books. The scheme is practicable through a committee of some of our best educational institutions or a commission appointed by the teachers of the Province to compile works for the schools. Wealthy men imbued with patriotism, interested in the national and educational prosperity of the Province can be secured to guarantee the publishers free from all loss. The guaranty would be necessary only for a short time; the profits in a year or two would amply indemnify the undertakers of the scheme. If the compilation of books is left to individuals of however large experience, it would fail of success, because he or they, like some other authors of school books, would originate works narrowed by individual ability and experience, not broad and comprehensive in principle and utility—books good and true in the author's own little sphere of thought and activity, not good and true for a great country filled with people or the various nationalities speaking the English language.

Books adapted to a wide-spread country require in the compilation the united skill and intelligence of all its enlightened educators to develop successfully the details in any system of school books. Surely we have skilled talent sufficient to warrant the attempt. The market for purely Canadian works would be the whole Dominion—an ample field and one well worthy of being filled by the productions of our own men. By becoming the compilers and publishers of our own works a uniformity could be secured, obviating the necessity for changes and frequent introductions of foreign books, always containing much objectionable matter. The only possible objection to such a scheme is the comparatively small English-speaking population of this Province; but the spreading Dominion does now require a native supply of books, and growing it will continually afford a demand for them, commensurate with a rapidly increasing population.

We have an excellent History of Canada—Dr. Miles'—it is very broad in its views, and deals as veracious histories should, in generalities rather than particulars, excepting wherein particulars demand special notice. Of the common school books, it is about our only one that is not open to the greatest criticisms and strictures, and hence is not obnoxious to the mass of teachers. All honor to Dr. Miles for what he has done for education in this Province. May the country produce more men like him. The term Radical in politics is odious to many good but harmless people, who wish for no progress no development—who imagine that the word means Communist of France—him who loves anarchy rather than a stable government—that it means the complete destruction of all rule, order and ties that bind people together into enlightened communities—that it means disloyalty, that in religion it means infidelity. Well, as to the present system of school books, I am a Communist, a Radical, a Rouge of the most uncompromising type, disloyal, to infidelity. As text books for our schools, have done with them, say I; wipe them from existence. Twenty-one years' experience in their use in the high schools in the district of Bedford, first in this beautiful village—entitle me to speak of them in the terms in which I do. I have no compromises to make with them, or with those who advocate their use by young scholars. Legislation cannot better this matter excepting to enact total destruction and to furnish the means to compile and

publish something modern. It cannot otherwise bridge the gulf three hundred years wide and place us beside other enlightened peoples. Government may force children to school for so many hours a day, but it cannot warp the child's affections and make it regard the unlovely as lovely. It cannot legislate an interest into an object so as to make the young mind seek it, dwell upon it, love it, study it. The truth is beautiful; let us not be afraid of it.

This paper was well received by the entire audience, and after it had been read a very lengthy and interesting discussion ensued, proving it to be the most important paper of the entire Convention.

Professor Hicks thought it did not matter so much what kind of books were used if we had really good teachers.

Dr. Miles stated that it had been the intention of the late Government to add a clause to their School Bill, creating a Depository where publishers of school books could send their works for teachers to examine for themselves. The Council of Public Instruction did not deserve the censure which Mr. Butler had bestowed on them as they had carefully examined the books used in the schools. He believed they should not encourage books from the other side of the line in our common schools. We wanted to teach our children loyalty as well as the common branches of education.

But, as respected the whole subject of School text-books, there was one present at this meeting who, though not a professional teacher, was nevertheless in a position to give a great deal of useful information, and some that might mitigate the strictures that were often too hastily passed upon the books used, and upon the action of the Council of Public Instruction concerning them. He hoped that the gentleman alluded to—Mr. S. Dawson, of Montreal,—would give the meeting his views on the subject.

Inspector McLaughlin, of Sweetsburgh, did not approve of the old Upper Canada series of books. They were neither French, English nor Latin.

Mr. S. Dawson, of Montreal, said the great fault of modern readers was that they endeavored to teach all manner of sciences while teaching the pupil to read. The books Mr. Butler condemned were, most of them, but recently introduced into our schools and had come from Ontario, where there was so much talk about the perfection of their school system. There was no grammar published in Canada, and as to the spelling books, they were not used now as spelling is not fashionable in our common schools. There was great difficulty in introducing school books of our own, as we (the Protestants) were but few in number in this Province, and the other Provinces would carefully exclude all books published in Quebec from their schools. The cost of books depended on the number of them that could be sold.

Mr. Justice Dunkin said the duties and powers of the Council of Public Instruction were somewhat peculiar. They could exclude whatever books they chose from the schools, but when once they gave their sanction to any work, they could not rescind that sanction; so that many books that had become antiquated were continued in our schools. Some of the books that were recommended were exclusively for the Catholics, others exclusively for Protestants, and others for general use. There was greater difficulty in securing really good books than most people imagined; but give us a first class teacher and I don't care what books are used, as he will cull out from the books what is most needed by the pupils, and also supply any deficiency there may be. He must acknowledge however, that our school books were merely an epitome of the College books only much harder and dryer. It is now

considered gentlemanly to write illegibly to most readers, and if a number of the words are misspelt it is all the better. We don't want our children to be looking south all the time, nor westward to Ontario. We should have Quebec books and sentiments. He said in conclusion, that it was a very difficult task for men to write books for the use of small boys; as they have forgotten how they felt in their boyhood.

After a few remarks from others, the Convention adjourned to 7 p. m.

CLOSING MEETING.

The Convention met again at seven o'clock p. m.

The Chairman said he was sorry that time did not permit them to discuss the merits of the School Bill introduced by Hon. M. Onimet, but he would recommend all teachers to read the bill carefully, and at the next annual convention they would have much more time at their disposal, as it was intended to continue the next session for two or three days. Personally he was opposed to many of the enactments of the new bill, and the teachers should be prepared to let their voice be heard in this matter.

Rev. Mr. Nighswander moved a resolution expressing approval of the chemical apparatus exhibited by Dr. B. Edwards.—Carried.

SCHOOL DISCIPLINE.

A paper on "School Discipline" was read by

Inspector McLaughlin. He said the teacher should have a definite end in view in all discipline; she should respect herself if she wished to retain the respect of her pupils. She should also learn to control herself, or else she would not be able to control a room full of active children. Rules must not be broken with impunity either by the teacher or her pupils. In many cases the parents had failed to establish their authority, and of course that made it much more difficult for teachers to maintain theirs. The school house should be neat and with a good play-ground attached. The health of the pupils should be attended to and both teacher and scholar should be kept busy during school hours. There should also be a thorough understanding between parents and teacher, and for this purpose the teacher should visit the parents at their homes as soon as possible.

Mr. Emberson, editor of the *St. John's News*, made a few remarks about the necessity of shortening the hours of labour for teachers in academies. A former speaker had stated that academy teachers were much underpaid. It was difficult to raise the money to increase their salary, but it was not difficult to decrease the time in school one hour, and that was tantamount to an increase in the salary. An academy teacher had once stated to him that for the last hour in the afternoon session in school he merely acted the part of a nursery governess by keeping the beloved children another hour from bothering their parents at home.

PHYSICAL EDUCATION.

Mr. Duval, of Montreal, then read a paper on "Physical Education." He said that Plato gave great attention to the physical training of his pupils, and the ancient Greeks showed how much they prized this training, as there were seven gymnasiums in ancient Athens. The greatest intellectual culture, along with the greatest physical culture, should be the motto of the teacher. If parents neglect to attend to the proper physical culture of their children the teacher should endeavor to supply

the neglect. Plenty of pure air in the school-room, and abundance of exercise in the open air, is required by our children, and the teacher must see that they get these requisites; it is not only necessary to give the children a sound mind, but also a firm body.

Professor McGregor said it was rather singular that the need of physical culture in schools had begun when the use of the birch was abandoned. It seemed that the free use of the rod had formerly furnished sufficient physical training to both master and scholar; this subject deserved serious consideration.

Mr. McGregor's remarks, which were given in a jocular manner, caused great mirth to his hearers.

SUPERANNUATION.

Professor Andrew then gave a reading, after which, Professor Hicks introduced the subject of the Teachers' Superannuation Fund, and remarked that it had been hitherto a failure for want of sufficient teachers contributing towards it. The lady teachers will not contribute any part of their small salary, as they mean to abandon school-teaching as soon as possible, and look for their future support to something more tangible than a superannuation fund. He was happy in having Dr. Miles with them to-night, so that they might get all the needed information about this fund.

Dr. Miles said that as a general rule the teachers, both male and female, desired to get out of the business as soon as possible. A teachers' superannuation fund had been established about 20 years ago, by which each teacher who paid an annual sum of \$4 would, in case of being disabled, have his money all refunded to him with the addition of half as much more supplied by the Government. There were only 93 contributors to this fund at present, and the amount paid out last year to aged and infirm teachers was \$5,150. Of this sum of course by much the greater portion had been contributed by the Government, as the subscriptions of teachers were wholly inadequate. He had several times discussed this subject with his colleague Dr. Giard at Quebec, and it was the conviction of both that the Government was most favourably disposed, and willing to co-operate with teachers and others interested in establishing a just and practicable arrangement for superannuation, for it was not creditable to the country nor humane to leave our worn-out instructors of youth to perish from want, or to eke out a miserable existence by attempting to earn a trifle by bodily labour for which they were incapacitated, and from other sources of which he could name instances, and which he was sure the meeting would consider even more to be lamented. However, as the Committee, appointed last year to prepare a scheme for superannuation with the view to strengthen and extend the existing arrangement, had no report to render, he hoped that it would be instructed to come forward as soon as possible with a practicable plan.

Professor Hicks asked Mr. McIntosh, teacher of Granby Academy, to state what was the law in Ontario regarding the Teachers' Superannuation Fund?

Mr. McIntosh said that every male teacher in Ontario had \$4 each year kept out of his salary, and invested in the Teachers' Superannuation Fund. Should the teacher become disabled he would receive from the fund \$6 for every year he has contributed thereto. Should he die, his wife or children would get one-third of this sum, but should he leave the business of teaching he forfeits all claims on the fund. This tax was not favorably viewed by the teachers, as the amount paid in was so much in excess of what they were likely to receive from it.

The Committee of last year was nominated afresh, and

the subject was then dropped, after a few more remarks.

Professor Andrew here gave a couple of readings,—one from Mark Twain causing great merriment among the audience.

Votes of thanks were then passed to the people of Granby for their exceedingly kind treatment of their visitors, and also to the railroad companies, and the Richelieu Steamboat Co.

A resolution was passed thanking the Protestant School Commissioners of Quebec City, whose Chairman Mr. Hossack was present, for their co-operation in the endeavour to give this annual meeting more of a truly Provincial character than former meetings and for their kind consideration towards their own teachers in furnishing them with facilities for coming.

The President then declared the eleventh annual meeting of the Association closed adding that it had been satisfactory and gratifying to him. God save the Queen was enthusiastically and loyally sung, and then Rev. Mr. Fowler pronounced the Benediction.

The attendance of the public of Granby at the meetings of the Conventign was very large, the temperance hall being crowded to its utmost capacity at each of the sessions. The arrangements for entertaining the delegates were all that could be desired.

Owing to the exertions of Mr. W. W. Lynch, M. P. P., the President, and the action of the Quebec School Commissioners, and last, not least, the unbounded hospitality of Granby, this meeting was universally allowed to have been the most successful of all Conventions of Protestant Teachers of the Province of Quebec.

The Resources of the English Universities.

In 1872 a Royal Commission was appointed "to enquire into the property and income belonging to, administered or enjoyed by the Universities of Oxford and Cambridge, and the colleges and halls therein (whether held or received for their corporate use, or in trust, or in whatsoever other manner), including the prospects of increase or decrease in such property and income; and also to report the uses to which such property and income are applied, and all matters of fact tending to exhibit the state and circumstances of the same, together with the opinion formed by them touching the condition, management, and custody of the said property and income." In accordance with these instructions, the Commissioners proceeded with the investigation entrusted to them, and as the result of their labours, have recently issued a very full and exhaustive report on the points entrusted to their care.

The report is divided into three sections, having reference respectively, 1st. To the property of the Universities and Colleges on the 1st of January, 1872. 2nd. To the income of the Universities and Colleges in the year 1871; and 3rd. To the expenditure of the Universities and Colleges during the year 1871.

Under the first head we have information as to how the property now belonging to the Universities and Colleges was acquired, and what is its present extent. The most ancient Colleges were founded in the 13th century, and were from the first endowed with manors, lands, &c., barely sufficient to meet the necessary expenses according to statute. The largest Colleges were not established till the 14th and 15th centuries, and were generally endowed from church property belonging to religious houses which had fallen into disrepute or decay. When the Monasteries were suppressed by Henry VIII, a still larger amount of ecclesiastical property was diverted to academical purposes. In this way, with continued private benefactions, property to a large amount has been accumulated consisting of " (1) Lands, (2) House Property, (3) Tithe Rent-charges, (4) Other Rentcharges, such as free-farm rents and fixed charges, (5) Stocks, shares, and other securities of a similar kind, and (6) other property, such as fines and other profits from copy-holds of inheritance, minerals, timber, &c."

The landed property consists of 319,718 acres, chiefly in the southern counties. Of this property 7,683 acres belong to Oxford University, 2,445 to Cambridge University, 184,764 acres to the Colleges and Halls of Oxford, and 124,826 to the Colleges and Halls of Cambridge. These lands are leased in various ways, and yield a large though very varying income. Of house property there is also a very large amount, the value of which will be largely increased as many long leases fall in. Government and other stocks are held to such an amount that the yearly income from them is 66,496*l.* 19*s.* 7*d.* The number of benefices in the gift of the University and College authorities amounts to 756, of the annual net value of 135,016*l.* 17*s.* 11*d.*

The total income of the Universities and Colleges for 1871 was 754,405*l.* 5*s.* 1*d.*, of which 665,601*l.* 10*s.* 2*d.* was for corporate use, and the rest in trust. The revenue was derived partly from the property and partly from room rents, fees, etc. Of this income the share falling to Oxford University was 29,043*l.* 3*s.* 9*d.*; to Cambridge University, 13,917*l.* 3*s.* 9*d.*; to the Colleges and Halls of Oxford, 307,369*l.* 17*s.* 4*d.*; to the Colleges of Cambridge, 264,266*l.* 17*s.* 10*d.* In all, 614,587*l.* 7*s.* 6*d.* from what may be called external revenues. Keble College has no external revenue, but imposes a uniform charge of 81*l.* per annum on all students. This moderate sum includes everything:—Maintenance, tuition fees, rent of rooms, fuel, &c., and the result of the experiment shows a profit on 1873 of 502*l.* after all charges had been paid.

The tuition fees in Oxford are generally 21*l.* per annum in Cambridge, 18*l.* for an undergraduate pensioner; 6*l.* for a sizar, and 1*l.* 10*s.* per term for every B. A. In Oxford the income from fees was in 1871, 30,761*l.*, and in 13 out of 17 Colleges in Cambridge, 2,413*l.* The heads of the Colleges in the two Universities together receive annually 50,958*l.* 19*s.* 3*d.* Of this sum the sum of 19 Oxford Colleges receive 30,543*l.* 12*s.* 4*d.*, and those of 17 Cambridge Colleges, 20,415*l.* 6*s.* 11*d.*

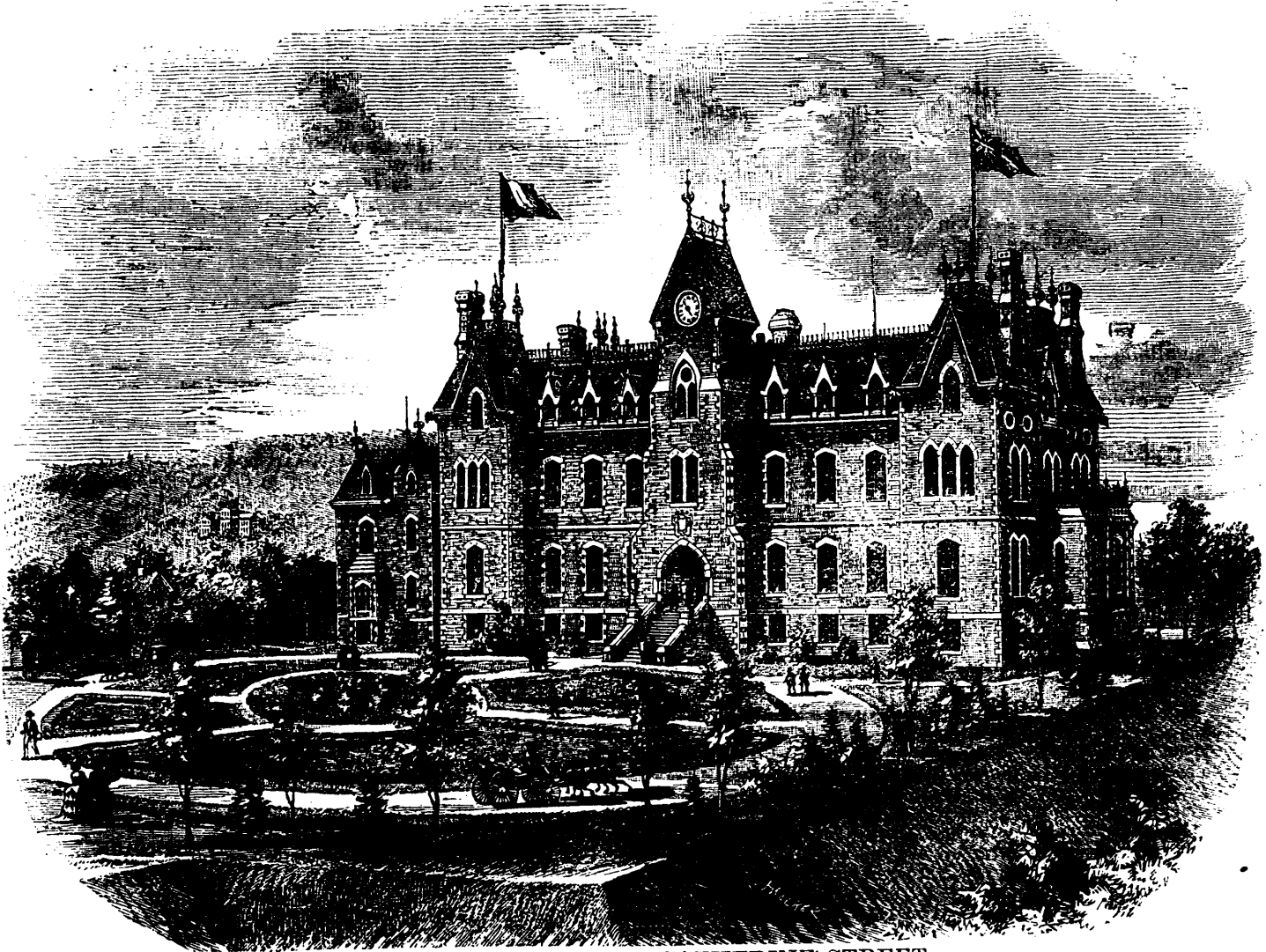
The Fellows of Colleges in 1871 divided among themselves 204,147*l.* 15*s.* 7*d.*; the Fellows in Cambridge getting rather the larger half.

The scholars and exhibitioners received out of the corporate funds £50,534 5*s.*, besides large sums paid out of the trust funds for the same purpose.

The University professors received out of Colleges, incomes in Oxford £6,694 10*s.* 10*d.*, in Cambridge £1,011 11*s.* 8*d.* More than £14,000 were spent in the management of estates, or about 2 4 5 per cent. on the value, but this does not generally include the salaries of the financial officers. In the management and expenditure of such large sums there is necessarily a great deal of waste, but the Commissioners confine themselves exclusively to the work assigned them, and having stated facts, leave these without making any suggestion or hinting at any misappropriation. In the gentlest way the remark is made that in certain cases there is a marked disparity between the property and income of certain Colleges and the number of their members. In other words, the incomes are very large and the work done comparatively small. This, however, is thought not to be within the scope of the Commission, and consequently nothing more is said about it.

It is very evident that University reform in England has not reached its limit. On the contrary, it is very very likely that this Report may supply data for making many changes and effecting great improvements, both in the management and expenditure of funds, which are very large at present, and likely to be nearly one-half larger before the end of the century. The enquiry into the management of endowed schools in England showed a very large amount of waste and malversation of funds. It would not be correct to say that similar revelations in connection with the Universities have been made. But when we learn that generally Fellows of Colleges are the Bursars, and other Fellows the Auditors, we may little wonder if the accounts are sometimes rather slovenly kept, and if the funds are not always turned to the very best advantage. It is surely too much to pay for the learned leisure even of the large and respectable class of College Fellows, nearly one-third of all the funds connected with the two great English Universities. At least it is a fit subject for discussion whether some part, at any rate, of that sum might not be turned to better account.—*Globe.*

THE CATHOLIC COMMERCIAL



FRONT VIEW FROM ST. CATHERINE STREET.

The rapidly increasing industry and prosperity of the city of Montreal have assumed such proportions of late years as to make it not only the commercial capital of Canada, but one of the first business centres in America.

This being the case, it was not surprising to find our citizens taking early measures to have the intellectual education of their young people keep pace with the development of their material resources. The Catholic portion of the population, unwilling to lag behind in the march of intellect, felt it incumbent on them to establish a first-class Commercial High School.

A few years ago the Commissioners of Catholic Education undertook the work, and with laudable energy and enterprise brought it to a consummation; and for the last three years it has been in most successful operation.

An admirable site was selected and secured: and for comfort and convenience, combined with beauty and elegance of outward form and inner arrangements, the buildings thereon erected will bear favorable comparison with those of any other educational establishment in the Dominion. The construction of the buildings was entrusted to an architect of eminent ability and experience, and with the money appropriated for the purpose, a truly magnificent monument has been here erected in the cause of education.

The beautiful mountain of Montreal, lifting itself in "royal" grandeur above the horizon, and stretching towards the city

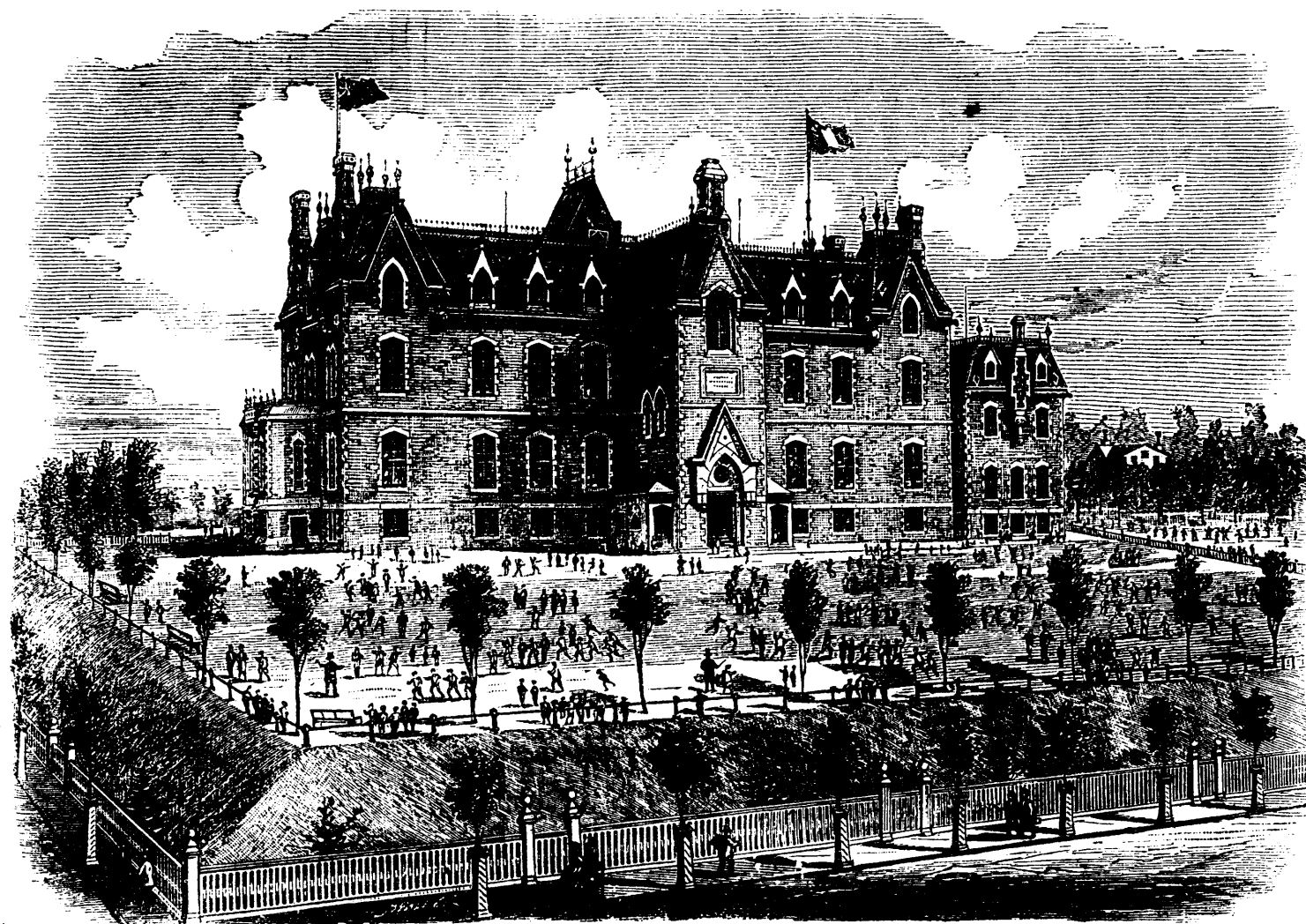
in a series of gently undulating hills, delights the beholder and varies the beauty of the surrounding landscape. The Reservoir, the Waterworks and the McGill University, occupy one of these declivities of the mountain, while handsome country seats—the residences of private gentlemen or wealthy merchants—occupy the others. Entirely isolated from the other eminences, and still nearer to the city proper, stood one of those hills, which, from its extent and natural position, seemed well adapted for the site of a public institution. This was the delightful spot chosen by the Catholic School Commissioners for the erection of their Commercial Academy.

The plateau on which the buildings have been erected rises more than twenty-five feet above the level of surrounding streets, and contains an area of several acres of land. The main entrance on St. Catherine street consists of a magnificent avenue sixty-six feet wide and bordered by a beautiful ever-green hedge.

The main building is 165 x 45 feet, and the style of architecture is that of the sixteenth century, and epoch so productive of combined strength and beauty in civil and municipal edifices. This style of architecture shows how well the ogival style may be made subservient to the exigencies of modern times, as exemplified in many of our public buildings and private mansions, as well as in the less pretending residences of citizens, where elegance and beauty combine with solidity and comfort.

The Commercial Academy presents a strikingly well-dispo-

ACADEMY, MONTREAL.



• REAR VIEW FROM ONTARIO STREET, SHOWING PLAY GROUND.

sed group of uniform buildings, the sameness of the architecture being relieved by tall towers and pretty pavilions in pleasing variety. In the centre *façade* of the main building stands a stately tower, eighty feet high, and at its base a flight of grey granite steps, crowned with two beautiful balustrades, leads to the main entrance door. Within this centre tower stands a large and costly clock, the large dial faces of which announce the passing hours with unerring certainty.

On the right and left of the centre *façade* stand the two wings of the main building, with their large basements below, and their pretty pavilions and dormer windows above, the ornamentation of the latter two enhancing the beauty of the roof, which is itself crowned with a wrought and gilt iron railing of attractive appearance. At either end of the building there are massive stone porticos, which lend an improved appearance to the *façade*. Lastly, the chimneys, gracefully rising above the roof, are so constructed as to impart additional beauty to the general appearance of the building.

The *façade* fronting Ontario street presents the same arrangements as that fronting St. Catherine street, which we have just described. There is, however, a greater variety of detail, whether we consider the main entrance the central tower, or the framings and chimneys.

This magnificent pile is connected by an elegant verandah or gallery, with a comparatively small but beautiful edifice, intended for the residence of the Principal. The limited

dimensions of this house, in which are repeated, on a diminutive scale, the arrangements of the larger edifice, give to it a comfortable, tidy and self-contained appearance. In its structure are to be found the most delicate and well-ordered details of the other edifice—a turret, a stone verandah, cornices and dormer windows, which latter, with the chimneys, project on an ornamental spiral roof.

If from the exterior we now pass to the interior of the building, we find that its different parts are so disposed as to present everywhere that pleasing appearance which is so characteristic of the exterior. The vestibule and reception room are elegant, ornate and beautifully artistic in design and execution. The principal stairway is large and commodious; the halls and class-rooms chaste and simple, yet fitted up with the utmost comfort and convenience. The means of securing thorough ventilation at all seasons have been made a principal feature of the interior arrangement.

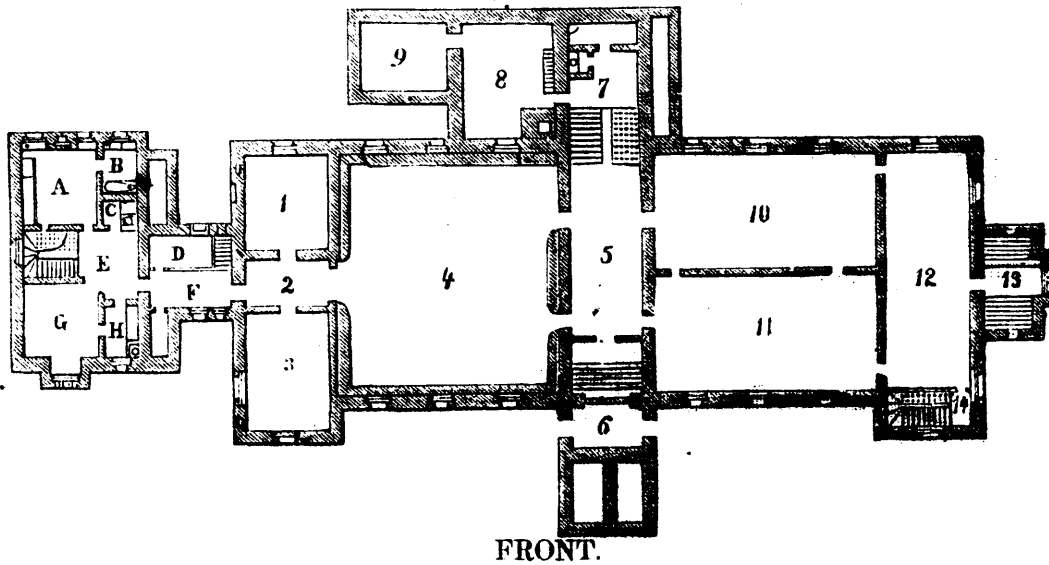
The upper story of the building consists of a large and spacious hall, intended for the public exercises of the pupils—*séances*, distribution of prizes, &c. The veneering of its intricately carved ceiling and its stained glass windows of divers colors, give it a very imposing appearance.

We need not speak at much length of the various details, which everywhere exhibit a uniformity of style. We may, however, notice the principal ones.

The vestibule and corridors are paved with marble, the floors

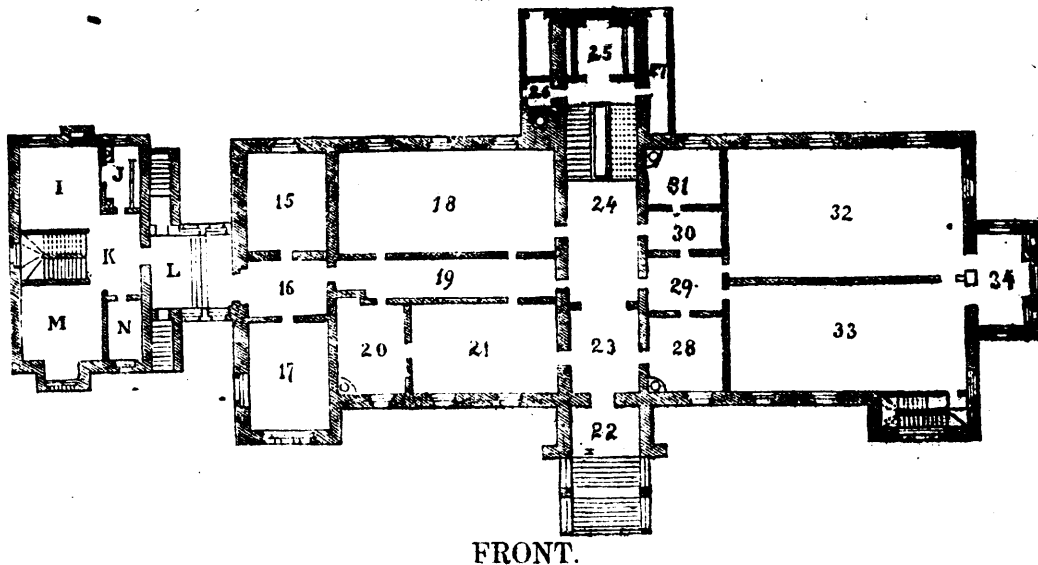
PLAN OF INTERIOR

BASEMENT.



- | | |
|-------------------------------|-------------------------------|
| 1 Class-room. | 8 Furnace-room. |
| 2 Passage. | 9 Coal Collar. |
| 3 Class-room. | 10 Class-room. |
| 4 Recreation Hall. | 11 Class-room. |
| 5 Hall. | 12 Chemical Laboratory. |
| 6 Front Entrance to basement. | 13 Vestibule. |
| 7 W. C. | 14 Private Staircase. |
| | A to H Principal's Residence. |

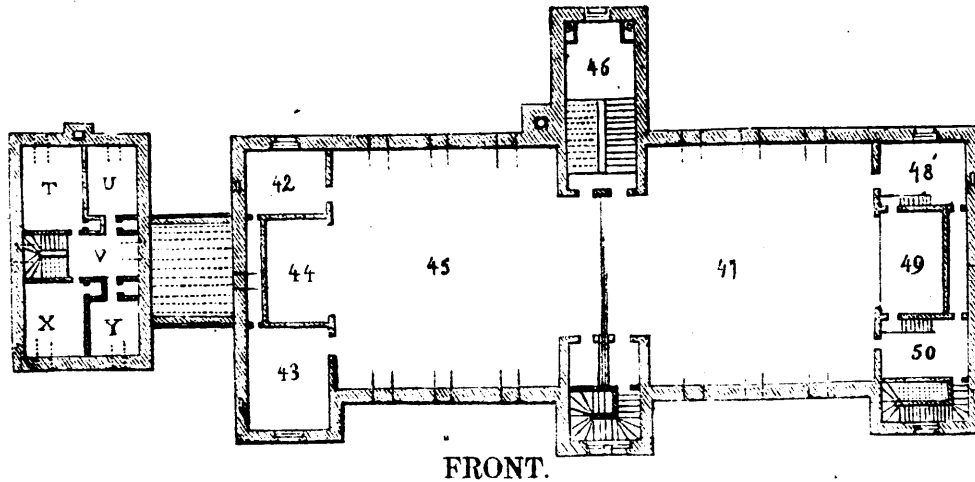
FIRST FLOOR.



- | | |
|---|---|
| 15 Library. | 25 Pupil's Entrance. |
| 16 Private Entrance. | 26 & 27 Porches. |
| 17 Board Room School Commissioners. | 28 Accountant's Office. |
| 18 Drawing Class-room and Scientific Library. | 29 Passage. |
| 19 Corridor. | 30 Stationary Room. |
| 20 Principal's Office. | 31 Janitor's Room. |
| 21 Reception Room. | 32 Natural Philosophy Class Room & Cabinet. |
| 22 Principal Entrance. | 33 Mathematical Class-Room. |
| 23 Vestibule. | 34 Cabinet of Optics. |
| 24 Hall. | I to N Principal's Residence. |

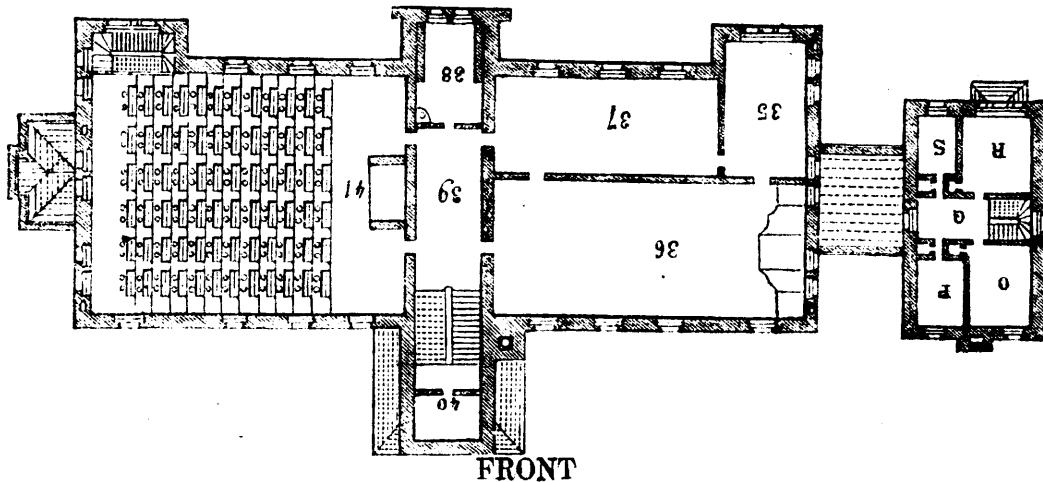
OF BUILDING.

SECOND FLOOR.



- | | |
|-------------------------------|--------------------------------|
| 35 Class-room. | 39 Passage. |
| 36 Commercial Class-room. | 40 Cabinet of Natural History. |
| 37 Class-room. | 41 Study-Hall. |
| 38 Professor's Retiring Room. | O to S Principals Residence. |

THIRD FLOOR.



- | | |
|-----------------|-----------------------------------|
| 42 & 43 Vestry. | 47 Academic Landing. |
| 44 Sanctuary. | 48, 49 & 50 Stage and Ante-rooms. |
| 45 Chapel. | 51 Staircase leading to the roof. |
| 46 Landing. | T to Y Principal's Residence. |

of the reception room and library being of "Mintons" mosaic Tiles with diversified colors and variegated designs. The fountains or basins located in the different rooms are of marble and abundantly supplied with pure water, which diffuses a pleasing freshness through the building, purifies the air and maintains cleanliness among the pupils.

This Academy, capacious enough to accommodate several hundreds of pupils, is at present frequented by young men of the first Canadian and English families, who find here—to the credit of the able staff of zealous professors, be it said—all the advantages of a sound education in both languages.

As to sanitary advantages, it would be difficult to find a public institution more favorably situated. The spacious, open grounds surrounding it render pure invigorating air accessible from all sides; its elevated position secures it from dampness, whilst rain water runs off as soon as it falls, owing to the inclined position of the grounds.

The building is well heated by means of an effective hot-water apparatus; while a complete system of electric bells, branching from the Principal's office into the different rooms,

secures the maintenance of discipline and preserves the efficiency of its interior working.

Finally, this vast edifice, no less remarkable for the solidity of its construction and grandeur of its style, than for the chasteness of its ornaments, the beauty of its sculptured stone facings, the elegance of its carved veneerings and the mosaic pavements, has been erected at but a comparatively small cost. Considered as a whole, it is an honor to the Catholic citizens of Montreal, at whose expense it was erected, and is a credit to the executive ability of Mr. A. Leveque the eminent architect, who conceived the plan and superintended the construction of the building.

The course of studies is so arranged as to afford young men frequenting this institution ample opportunity for acquiring a solid commercial or scientific education—such as will enable them to occupy hereafter a prominent position in the ranks of commerce or industry. Besides the preparatory, commercial and scientific courses already established, the School Commissioners, ever anxious to further the cause of education and advance the interests of pupils attending the institution, have

opened, on the 1st September last, a special industrial course. In this laudable undertaking, they have been generously seconded by the Hon. Minister of Public Instruction for the Province.

There will open a new and interesting field to young men who have finished their scientific course in our classical colleges, and afford them an opportunity of studying whatever may be best suited to their capacity and inclinations.

This will be a complete polytechnic course, conducted on the same principles which prevail in the special and professional schools of France and England; and in order to ensure the fullest measure of success, the services of professors specially trained in the professional schools of the above named countries have already been secured.

All the pupils of the Institution, at present numbering nearly 400, receive, without any extra charge, instruction in artistic and linear drawing and vocal music,—and, with the view of promoting physical development, instructors in military drill, calisthenics and gymnastics, have been provided to exercise the pupils weekly.

There is a Primary School attached to the Academy, which may be seen in the grove to the left of the facing on St. Catherine street,—and which at present accommodates some 200 pupils.

The excellent drawings of the building, which we publish, give a fine idea of its imposing appearance. The engraving was executed by J. H. Walker, and reflects great credit upon his skill.—(*Montreal Gazette.*)

Art Schools in Southern Germany.

BY SCHELE DE VÈRE.

In one of the most beautiful parks of the Old World there rises on a slight eminence, a vast building, presenting to the south a line of immense windows, and filled in winter with the magnificent old orange trees of the Royal Gardens. Hence its name of the Orangerie, by which the good people of Stuttgart, the capital of Würtemberg, designate the noble structure. During the summer months of the year 1872, however, the building contained treasures of vastly greater import for the little kingdom than the costliest exotics and the rarest plants of the world. Every five years an exposition is held there of a special class of schools, the usefulness of which cannot be well over-rated, whether we look at the tangible results shown in this great hall, or at the influence they exercise on the taste and the wealth of the people.

From time immemorial the people of Southern Germany have exhibited rare talents for the higher branches of mechanical arts. No traveler through Swabia and the lands on the Rhine can help being struck with the exquisite beauty of villas and villagers' houses, while railway-stations, and even the flag-keepers' little huts, are often real master-pieces of architecture, and loaded with a profusion of admirable wood-carving. Swiss carvings are familiar to most of us; but the wealth of ornamentation with which the modern houses of Germany are decked is a matter of wonder and admiration to all new-comers. From majestic Berlin in the north to the smallest village in the south these new structures show in every feature of their architecture a master's hand; lintel and coping, window-frames and cornices, are cunningly carved by skilful stone-masons; front and sides are covered with fresco-painting in subdued colors and classic patterns; and in suitable places, over the wide entrance-gate or in well-arranged medallions, the sculptor finds room for a noble statue or a portrait-bust. Nor is this love of ornament limited to the great and the rich; the humble house has its galleries with richly-carved railings and graceful cornices, and even the vintner's modest hut in a cucumber field has its few titbits of rich coloring and delicate carving.

The skill which has placed all these sources of enjoyment, these etchings of beauty which remain "a joy forever" to the educated eye, within reach of all, is the result partly of an innate love of the beautiful granted from on high to most Southern nations, and partly of an admirable system of education which finds its expression in the above-mentioned exhibition. For long years the little kingdom of Würtemberg has been famous among German principalities for its Sunday drawing-schools, frequented by mechanics of all degrees, from the youthful apprentice to the hoary master. Here, during the

hours not devoted to divine services, volunteer teachers, enthusiasts for their art, met their volunteer pupils, and taught them drawing in all its various branches. The time was necessarily very limited, and hence, for many years, no real artistic skill could be obtained in these schools except by a few rare children of genius. The hard, coarse work of the week often destroyed the delicate touch required for holiday labors, and the eye alone could be permanently benefited.

It was not until the year 1854 that the general interest felt in this kind of instruction by men of influence and far-seeing statesmen on one side, and by the eager, ambitious mechanics of town and country alike on the other side, led to the establishment of regular evening or night schools for the same purpose. It was a noble sight to watch the weary artisan and the hard-working mechanic come hither after a day's incessant labor, still anxious to improve, to learn, and to benefit others as well as himself. Youths of barely fifteen, sturdy men in the full vigor of their strength, and old, gray-haired masters, all met here as humble pupils to teach the stiff fingers new and rare skill to train the eye to perceive unsuspected beauties, and to reproduce with the brush or the burin, the hammer or the saw, the masterpieces of great artists. The schools were over-crowded; soon one hundred and twenty-five such institutions sprang up in the small kingdom; the indispensable expenses of room rent, gas, models, etc., were cheerfully borne by the eager learners, and ere long the results appeared in every town and every village. Low, dark huts were replaced by bright, cheerful houses; dirty mud-walls reappeared as bright, stuccoed surfaces, to which a few sparing bits of color gave light and beauty; the low door with its stone seat displayed a modest garland of well-carved flowers, to take in winter the place of the vine and the clematis; and neat little summer-houses arose, as if by magic, in every garden. Far greater, of course, was the change in towns and cities, where entire new quarters were built in the improved style of architecture, giving the mason, the painter and the sculptor ample opportunity to display their newly-acquired skill. But the most cheering encouragement came when the great London Exhibition revealed to the astonished multitude the beauty and the skill displayed in the workmanship of mechanics trained in these Würtemberg schools, when prize after prize was obtained by their pupils, and when finally, sensible Englishmen actually sent their most talented workmen to learn the secret of such great success, the joy and the pride of the people knew no bounds.

The immediate effect was the extension of the facilities heretofore offered only at night and during a few Sunday hours. Every school in the land, above the humblest, arranged a large hall, which was kept open on one day of the week to all who chose to avail themselves of the opportunity. Then winter courses of six months' duration were added for the benefit of laborers whose work ceased with the fine season. Finally a class of special schools sprang up, under the name of Fortbildungs-Schulen—literally schools for further advancement—to which all had free access who wished to profit by its instruction, and who were willing to pay the small fee required. For, as in the excellent public schools of the kingdom, so in these technical schools also, the principle was adhered to that he who could must pay, since no one values much what is given away without price. Those really unable to pay even the small fee required here and in all public schools find no difficulty in being admitted gratuitously; and then education may be said to be virtually free throughout the land, from the village-school to the universities. In the case of the industrial schools the state pays one-half of the expenses, and the community in which the school is placed the other half, and nothing can speak more forcibly of the usefulness of these instructions, and the good sense of the people in appreciating their worth, than the fact that there are now four hundred such Fortbildungs schools in operation.

It was soon found that the eagerness with which instruction was sought, and the endless varieties of subjects for which pupils called, required a subdivision in the general purposes of those schools. They divided in the larger schools, into a mercantile department, where book-keeping, the laws of exchange (very complicated on the Continent), modern languages, telegraphing, etc., were taught, and an industrial department for geometry, physics, chemistry, mechanics, and the so-called fine arts. What deserves special praise is the fact that, with a view to the true interests of the other sex, special schools of this kind are established for married and unmarried women,

and the benefits arising from the source of lucrative employment thus opened to deserving and well-qualified women can hardly be over-rated.

Every five or six years all these Fortbildungs schools unite in holding a general exhibition, such as was held in 1872 in the city of Stuttgart. Separate alcoves are allotted to each district, and within the narrow compass each town or village has again its small space to itself. Here are shown not only the best that each school can boast of, but the actual working-books, drawings, and daily tasks of the pupil, inscribed with his name. This creates naturally an eager competition; district vies with district, school with school, and pupil with pupil. The exhibition is visited by thousands; the king and his court never fail to inspect every part of it minutely; anxious friends and relatives crowd around the tables of their native place; artists and masters of every handicraft come from abroad to see and to learn; and foreigners examine with growing interest these works of humble, unlearned workmen. No branch of mechanical industry is wanting in this admirable collection, from the horseshoe to the artistic bronze, from the mason's rough centre-stone, to the sculptor's bust. The lock smith shows his new combination lock, and the draughtsman his new patterns for calicoes and silks. Models abound in wax and in clay, in stone and in precious metals. The younger pupils content themselves with faithful copies of masterpieces, but many an exhibitor of barely fifteen already ventures to send his newly-invented problem in mixed mathematics, his original model of carving, or an etching of his own invention. In the purely ornamental department, female pupils excel naturally by native taste and a keener sense of the beautiful, and many are thus trained to compete with experienced artists for the very lucrative places of draughtsmen in great factories. Nor are the domestic wants neglected; cooking for the house and brewing for the multitude, the making of inlaid floors for the parlor and the building of palaces and great institutions, are all thoroughly taught, as well as the art of the landscape-gardener, the horticulturist, and the florist. Agriculture alone is excluded, as that is taught in special schools, such as Hohenheim, which have already obtained a world wide reputation.—*Appleton's Journal.*

University Intelligence.

At the recent examinations in McGill College, the Scholarships (tenable for two years) and Exhibitions (tenable for one year) were awarded as follows:—

THIRD YEAR.

Natural Science Scholarship—* Lyman *Classical and Modern Language Scholarships*—* McGoun; † Watson.

SECOND YEAR.

Exhibitions—* Lalleur, * Newnham, * Graham, † Robertson.

FIRST YEAR.

Exhibitions—* Dawson, R., * Ross, J., * Donald, † Ritchie, C., § Taylor, E. T.

Fourth Annual Meeting of the Protestant Institution for Deaf Mutes.

The fourth annual meeting of the above institution was held last evening (15 Oct.) at 8 o'clock in the Synod Hall, University street, quite a large number of spectators being present. After a short prayer, the Chairman, Mr. Alexander, made a few remarks upon the success of the institution, and concluded by calling upon the Secretary, F. MacKenzie, Esq., M. P., to read the report of the Board of Managers, from which was gathered the following facts:—The number of pupils in attendance at the end of the school year was 20. Of these 12 were free pupils,

* Given by W. C. MacDonald, Esq. Value \$125, yearly.

† Founded by Charles Alexander, Esq.

‡ Given by T. M. Taylor, Esq.

§ Subscribed by the Governors.

§ Founded by Mrs. Jane Redpath.

7 paid full fees, and 1 paid in part. The Principal and Matron, Mr. and Mad Wyld, and the assistant teacher, Miss C. Bulmer, were complimented on the manner in which they had discharged their duties. The Board were convinced that the time had come when larger buildings and additional grounds were necessary for the proper working of the Institution, and that accordingly secured five acres of land in Mount Royal Vale at a very moderate price. It was proposed to erect buildings on this land at a cost of about \$25,000. It was believed that the property now owned by them would realize \$13,400 clear, which would leave them about \$12,000 behindhand. An earnest appeal was made to their fellow citizens of the Protestant faith to aid them in the undertaking. Letters from the Rev. R. Norman and C. J. Brydges, Esq., were read, expressing regret that the writers were unable to attend the meeting, and wishing all success to the work. The report of the Principal was then read, which gave a very clear and interesting account of the working of the Institution, of which our limited space will not permit more than a passing notice. The number of pupils who had attended since the foundation of the Institution, the causes of their infirmities, and the different sections of the Province from which they came, also the length of time that each scholar had been under instruction, was given. Printing and carpentering, the trades taught in the school, were very useful, the boys having made many articles of utility and ornament in the carpenter's shop, besides doing all repairs necessary to the premises. In the printing office they had turned out a little book of nearly a hundred pages, written by the Principal, as well as the annual report of the Institution, and many small jobs. The work of the future was commented upon, and allusions made to similar institutions in the other Provinces. The receipt of donations was acknowledged, and a list of the donors given. The medical report showed that the health of the pupils had been carefully attended to. The financial statement for the year ending 30th June, 1874, was not quite as pleasing as the other reports, it showing a balance due the Secretary and Treasurer of \$241.93.

The examination of the pupils was then proceeded with, and the manner in which they acquitted themselves was truly wonderful, especially when the great disadvantages under which they labour were taken into consideration. At the close of the examination, Alderman Nelson, Mr. Hugh McLennan, Mr. Wm. Clendinning, and M. J. R. Dougall delivered short addresses, in which they expressed their astonishment at the proficiency of the pupils and the pleasure which the meeting afforded them. It is to be hoped that the citizens of Montreal will come forward and subscribe liberally to the fund for the erection of new buildings which are necessary to the success of this much needed Institution.

POETRY.

SCHOOL TIME.

Don't you hear the scholars thrumming?
Bumble-bees in June?
All the leaves together thumping,
Singers hunting for a tune?
Master mending pens, and humming
Bonnie Doon?

As he thinks, a perished maiden
Fords the brook of song,
Comes to him so heavy laden,
Stepping on the notes along,
Stands beside him, blessed maiden!
He has waited long!

Cherry ripe is the glowing stove,
Grammar class is inflecting "love,"
"I love—you love, and love we all."
Bounding states are the Humboldts small,
Chanting slow in common time
Broken China's rugged rhyme:
"Yang-tse-kiang—Ho-ang-ho—"
Heavenly rivers! how they flow!

Writing class with heads one way—
 And tongues all out for a holiday!
 Hark to the goose-quill's spattering grate,
 Rasping like an awkward skate,
 Swinging round in mighty B's,
 Lazy X's and crazy Z's!
 Here a scholar, looking solemn,
 Blunders up a crooked column,—
 Pisa's own Italic tower,
 Done in slate in half an hour,
 Figures piled in a mighty sum;
 He wets a finger, and down they come?

Aproned urchin, aged five,
 Youngest in the humming hive,
 Standing by the Master's knee,
 Calls the roll of A, B, C.
 Frightened hair all blown about,
 Buttered lips in half a pout,
 Knuckle boring out an eye,
 Saying "P" and thinking "pie,"
 Feeling for a speckled bean,
 "Twixt each breath a dumb ravine,
 Like clock unwound, but going yet,
 He slowly ticks the alphabet:
 "A-ah—B ah—C ah—D,"
 Finds the bean and calls for "G."

See that crevice in the floor—
 Slender line from desk to door,
 First meridian of the school—
 Which all the scholars toe by rule.
 Ranged along in rigid row,
 Inky, golden, brown and tow,
 Are heads of spellers high and low,
 Like notes in music sweet as June.
 Dotting off a dancing tune.

Boy of Bashan takes the lead,—
 Roughly thatched his bullet head;—
 At the foot an eight year old,
 Stands with head of trembling gold:
 Watch her when the word is missed!
 Her eyes are like an amethyst,
 Her fingers dove-tailed, lips apart;
 She knows that very word by heart!
 And swings like any pendulum,
 Trembling lest it fail to come.
 Runs the word along the line,
 Like the running of a vine,
 Blossoms out from lip to lip—
 Till the girl in azure slip
 Catches breath and spells the word,
 Flits up the class like any bird,
 Cheeks in bloom with honest blood,
 And proudly stands where Bashan stood!

Evening reddens on the wall—
 "Attention!" Now—"Obeisance all!"
 The girls' short dresses touch the floor,
 They drop their courtesies at the door;
 The boys jerk bows with jack-knife springs,
 And out of doors they all take wings!

Vanished all—all changed as death:
 Life is not the counted breath.
 The slanting sun low in the West,
 Brings to the Master blessed rest.
 See where it bridges afternoon,
 And slopes the golden day-time down.
 As if to him at last was given,
 An easy grade to restful Heaven!
 His hair is silver—not with light,
 His heart is heavy—not with night.
 Dying day the world has kissed,
 Good-night, sweethearts! The school's dismissed!

Scribner.

OFFICIAL NOTICES.



Ministry of Public Instruction.

NOTICE.

We would call the attention of correspondents to the fact that all communications with this Department must be prepaid, as unpaid letters or papers will not be withdrawn from the Post Office.

Under this head we wish to notify those whom it may concern, that the postage on School reports, census, &c., is at the rate of one cent the ounce; also that books, and manuscript intended for the press, are charged at the rate of one cent for every two ounces, provided that one end of the envelope surrounding them, or part of it be left open.

SCHOOL MUNICIPALITIES.

Quebec, 12th November 1874.

The Lieutenant Governor has been pleased, by order in council, dated the 3rd of November instant, and in virtue of the powers conferred on him by the 30th clause of chapter 15 of the Consolidated Statutes of Lower Canada.

1. To erect into a separate school municipality the territory of the parish of Sainte Justine, in the county of Dorchester, comprising the whole of township Langevin, and from the said township that part of township Ware, reaching to number twenty-eight and twenty-two of the fourth range and up to number thirty-three of the third.

2. To separate from township Gore, in the county of Argen-teuil, the township of Wentworth, in the same county, and erect it into a district school municipality, under the same name and with the same limits which it has as a township.

3. To erect into a distinct school municipality the new parish of Saint Gabriel, in the county of Rimouski, such as erected for other civil purposes by proclamation of the Lieutenant Governor, dated the sixth day of December last.

4. To erect into a distinct school municipality the new parish of *Saint-Paul de la Croix*, in the county of Temiscouata, with the same limits as those which have been assigned to it as a canonical parish.

5. To detach from the municipality of Mont Carmel, in the county of Kamouraska, that part of the properties of Messrs. Achille Deschênes, Pierre Dionne, David Dumais, junior, Antoine Lavoie, François Miville, François Alexandre, Alexandre Santarre, and Joseph Anctil, junior, which belong to the said municipality and annex it to the municipality of Saint-Philippe de Neri, in the same county, for school purposes.

6. To detach from the municipality of Saint Roch, in the county of l'Islet, the part hereinafter described, bounded, on the north-east by the boundary line between the properties of Ferdinand Gagnon and Elzéar Arton, on the north-west side by the road separating the first and second ranges, on the south-west side by the by-road running between the properties of Elzéar Michaud and Elzéar Caron, on the south-east side by the road between Saint-Roch and Sainte-Louise, except Octave Marié, Elzéar Michaud and Jean-Baptiste Caron, to annex it to the school municipality of Sainte-Louise, at it is already for other purposes.

7. To detach from the municipality of Shipton, in the county of Richmond, lot number twenty three, in the eighth range of the township of that name, and to annex it for school purposes, to the municipality of Cleveland, in the same county.

BOARDS OF EXAMINERS.

The Lieutenant-Governor has been pleased, by order in council, dated the 3rd of November instant, and under and in virtue of the powers conferred on him by the 2nd article of the 64th clause of chapter 15. of the consolidated statutes of Lower Canada:

1. To appoint the Reverend William Leclerc and Mr. Alfred David Lacroix, members of the Catholic Board established at Montreal, to examine candidates for primary certificates, *vice* the Rev. Messrs Léon Villeneuve and F. A. Truteau.

2. By another order in council of the same date, the Lieutenant-Governor has been pleased, in virtue of the powers conferred on him by the 4th article of the 10th clause of chapter 15 of the consolidated statutes of Lower Canada, to appoint the Reverend Louis Severin Rheault, member of the examining committee sitting at Three-Rivers, to confer primary certificates *vice* the Rev. M. Baillargeon, who has definitively left the town.

SCHOOL COMMISSIONERS.

The Lieutenant-Governor has been pleased by order in council dated the 3rd November instant, and in virtue of the powers conferred on him by the 48th and 136th clauses of chapter 15 of the consolidated statutes of Lower-Canada, to make the following appointments, to wit :

County of Beauce. — Saint-Honoré. — Messrs. George Bougie and John Gablien, *vice* Messrs. Anselme Roi and Godefroi Poitras.

County of Beauce. — Saint-Pierre de Broughton. — Damase Beaudoin, esquire and Mr. Jean Gagné, continued in office.

County of Brome. — Saint-Vincent d'Adamsville. — Messrs. Damase Rainville, François Rousseau, Charles Fortier, Joseph Neveu and Joseph Messier, new Municipality.

County of Chicoutimi — Harvey — Messrs. Auguste Laforest and Ignace Tremblay, *vice* Messrs. Louis Boivin and Louis McKay.

County of Chicoutimi. — Village of Bagotville. — Mr. Michel Bouchard *vice* J. A. Gravelle, esquire.

County of Chicoutimi. — Saint-Alphonse de Pagotville. — Messrs. Jean Côté and Maxime Minier, *vice* Messrs. Jeanne Bouchard and Wilfred Tremblay.

County of Compton. — Whitton. — Messrs. Macdonald Beaton, Donald McAuley, and J. C. Matheson, owing to the vacancy caused by the division of the municipality.

County of Charlevoix. — Saint-Urbain. — Messrs. Gédéon Fradet and Eudore Girard, *vice* Messrs. Edouard Fortin and Adam Simard.

County of Dorchester. — Sainte-Justine, mission. — Messrs. Léon Fournier, Simon Tanguay, Simon Roy, Joseph Chabot and Elzéar Menard, new municipality.

County of Gaspé. — Barre à Choir. — The Reverend Louis Pâquet, *vice* the Rev. J. J. Lepage.

County of l'Islet — Ashford. — Mr. Paul Lebel, *vice* Mr. Damase Ouellet.

County of Ottawa. — Templeton. — Jacob Scarff, esquire, *vice* Mr. John Harris.

County of Rimouski. — Cherbourg. — Messrs. Louis Savard and Gilbert Lebrun, *vice* Messrs. George St. Pierre and Fabien Turcotte.

County of Rimouski. — Saint-Gabriel. — Messrs. Laurent Lamontagne, Célestin Parent, Joseph Pouliat, Elzéar Pelletier and Joseph Santerre, New municipality.

County of Rimouski. — St. Joseph de Lévis. — Mr. Duni Gagné *vice* the late Mr. Narcisse Ross.

County of Lotbinière. — Saint-Silvester. — Mr. Louis Delisle, continued in office.

City of Québec. — The Reverend Michael Burke and Mr. Maurice O'Leary, *vice* the Reverend Messrs. McGauran and Maguire.

SCHOOL TRUSTEES

County of Dorchester. — Saint-Edouard de Frampton. — The Reverend John Samuel Sykes, junior, *vice* the Rev. John Hay Jenkins.

County of Gaspé. — Percé. — Mr. Peter Mabee, *vice* Philip Vibert, Esquire.

County of Iberville. — Saint-Athanase. — Mr. William McGinnis, junior, *vice* Mr. Thomas Casson.

County of Missisquoi. — Philipsburg. — Messrs. A. S. Chicoine, Edouard Tetreault, and Hercule Ménard. Last election irregular.

County of Ottawa. — Saint-Etienne de Chelsea. — Mr. Norman Reid, *vice* Mr. William Thompson.

And by another order in council, dated the 5th of November instant.

County of Québec. — Saint-Dunstan. — Mr. Thomas Murphy, *vice* Mr. D. McWay.

THE JOURNAL OF EDUCATION.

QUEBEC, OCTOBER & NOVEMBER, 1874.

The Chevalier N. F. de Zaba's Method of Studying Universal History.

Whoever undertakes to prosecute the study of History, or to instruct others in that essential branch of Education, must be prepared to devote a considerable amount of time and of labour to the pursuit. There is, indeed, no intellectual pursuit with respect to which the student may not realize, by his own experience, the conviction that the mere knowledge of facts previously unknown to him is acceptable to the mind, and that there is a certain degree of pleasure accompanying the acquisition of that knowledge which alone serves to stimulate some persons to laboriously and perseveringly continue researches whose nature, objects, and results, are not appreciated by the world at large. But it would be vain to expect that such persons should have any other imitators, in this utilitarian age, than those who may sincerely value knowledge for its own sake, and without reference to its immediate application. Nor do we find that a majority of those who have enjoyed the opportunity at least of acquiring a liberal education, are excited to devote themselves to the study of special branches merely by being assured that the mind can thus be always delighted, or even by observing that enlarged knowledge sometimes confers on its possessor consideration and respect in society.

But when we speak of the study of History we are dealing with a branch whose utility is universally acknowledged, and which, within its range, presents for consideration innumerable and multifarious facts, the knowledge of which has a bearing, more or less important in all the walks of life, and in its relations to science, religion, politics, and the future destinies of nations.

How to enter upon and to continue the prosecution of this study has ever been made a question worthy of attention by thoughtful persons interested in promoting individual and national education, and towards its solution many systems have been heretofore presented to the public. Without particularizing these—further than to say that they all more or less aim at removing one great difficulty experienced in the study of History, viz: the apparent necessity for too severely taxing the mind and overloading the memory with a multitude of facts of diverse nature—we revert, in view of what we have here to say about the Chevalier de Zaba's Method, to the words of the celebrated Locke;

"Memory is, as it were, the store-house of our ideas; for the narrow mind of man not being capable of having many ideas under view and contemplation at once, it was necessary to have a repository to lay up those ideas, which at another time it might make use of. A methodical arrangement of the contents of such a repository enables its owner to find any article that he may require with the utmost readiness."

The suggestion afforded in the foregoing words of one of the most profound thinkers that ever lived, has no doubt been the main source of inspiration to the inventors of the various systems adverted to above. But, still, the numerous efforts made to supply the want have proved far from generally successful, and, it may be affirmed, the most competent students of Universal History, even after long and unabated perseverance, feel the need of some guide to lead them on from point to point; and these would, doubtless, as regards the collection of facts and their arrangement in the order of time, as well as the means of retaining them in the memory and of reproducing them when wanted, hail with gratitude the announcement of any really useful plan for surmounting the many difficulties. We

have seen in our own day that human ingenuity has accomplished so much in overcoming material obstacles—as, for instance, time and distance by the application of steam and electricity—that, in like manner it would be presumptuous to deny the possibility of devising means for accelerating progress in the acquisition of knowledge.

We think that the method of the Chevalier de Zaba is a most valuable contribution in the direction here referred to. It is very simple, and therefore easy to be understood and practically used, after a little attention has been carefully devoted to it. It is applicable as well to the study and teaching of Universal History as to the History of any particular country or nation. However voluminous the subject, it enables the teacher and the learner to

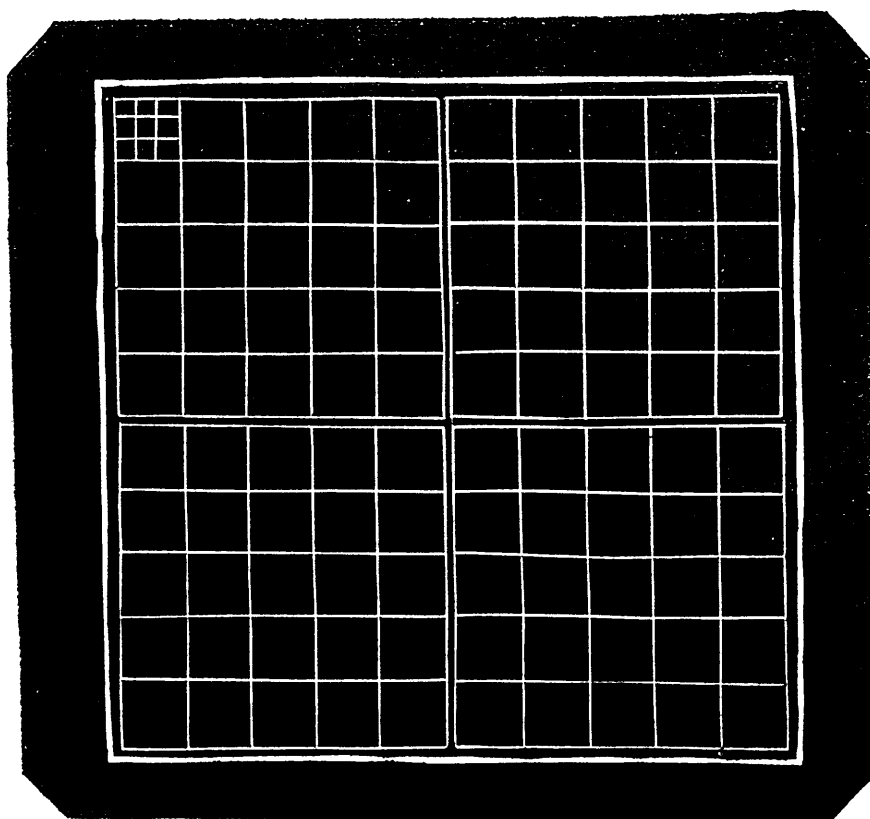


Diagram of one century, shewing the space for each year and the nine compartments intended to be located in each annual space.

examine the record of historical facts year by year and century by century without the least danger of deviating from the order in which events occurred. The consideration of the Method alone, as a help for the acquisition of knowledge, tends to promote order in the arrangement of thoughts and in the classification of ideas, and suggests very happily a way of commanding a whole subject, and of taking, as it were, a bird's-eye view at once of large numbers of facts, contemporaneous or not, similar or dissimilar in character. Nor is the Count's method nearly so artificial as those other systems to which allusion has been made—if, indeed, that can in any sense be styled artificial which is founded upon the conti-

nuous observance of the principle of mental association, by which the natural and spontaneous operations of the human mind are so largely governed.

But, without further general remarks on the subject, we shall now refer to the chief particulars of De Zaba's method.

1st. A chart is provided—a large one of 8 or more feet square, for use in class-rooms and libraries, and one smaller, of 12 or more inches square, for individual use, which can be folded and conveniently carried in the pocket—upon which are delineated 20 square spaces to denote 20 centuries of the Christian Era, and a like number of square spaces to represent 20 centuries *before* the birth of Christ.

Each space for a century is divided into 100 small squares, each of which denotes a single year. After a little practice the eye can be readily directed to the particular space allotted for any particular year, and which can be thus singled out, as it were, by the mind, and made to become the object of contemplation with respect to events that may have occurred in that year.

Again, in view of denoting both the characters of the events, and the years in which they may have occurred, each space for a single year is subdivided into 9 equal square spaces, experience having shewn that this number of compartments is sufficient.

For the comprehension of what is here stated the reader is referred to the diagram on preceding page.

2nd. The classes and kinds of historical events are signified by a few simple marks easy to be made and distinguished from each other, and, for each class or kind, one of the nine subdivisions or compartments—the same one in the space for each year,—is assigned.

For example. Each first annual compartment (No. 1 in our diagram) is allotted for *War, Battle, Civil War*.

No. 2. For acquisition by *Conquest, Treaty, or Marriage*.

No. 3. For *Calamities*, such as *Plague, Conflagration, Persecution, Earthquake, &c.*

No. 4. For *Eminent Persons, their Birth, Death, &c.*

No. 5. For the *Accession and Succession of Sovereigns and chief rulers*.

No. 6. For *Discoveries*, in *Geography, Science, the Arts, &c*

No. 7. For *Legislation, Diet, Parliament, Council, Congress, &c.*

No. 8. For *Revolution, Insurrection, Conspiracy, Riot*.

No. 9. For *Peace, Treaty of Peace, League, &c.*

The symbols employed to denote the particular character of the events, whether, for instance, the war indicated be foreign or civil war, or whether a discovery be Geographical or Scientific, are three or four in number—but the compartment in which it is placed shews the character of the event, and the square space containing that compartment give the year and the century.

3rd. Lastly, different *Colours, Blue Black, Red, Green, Yellow, Gold &c.*, are given to the marks used in order to shew at sight the particular *country* or nationality to which the symbol refers. Thus *Black* refers to Roman History, *Blue* to Biblical History anterior to the coming of Christ; and, for the Christian Era, *Black*, denotes the Roman Empire; *Blue*, the Church; *Red*, Britain; *Yellow*, France; *Green*, Germany; *Gold*, America. The requisite variety is easily given to the coloured marks, as, for example, by denoting what appertains to *British Colonies* by the use of *Red* and *Circular* marks instead of the *Red* and *Square* marks for Britain itself.

In the manner, and by the means described above, all the principal events of history may be placed on

record, localized, and brought into view, so as to shew their dates, order of occurrence, and character or class, as well as the countries and people to which they have reference—and, as we have already stated, the Method is remarkable for its simplicity and its ready applicability to the well known wants of the historical inquirer, of the teacher and the learner. It does not actually *teach* the Philosophy of History, nor the knowledge of the accessory incidents which have led to or accompanied the occurrence of all the great event of History, nor is it intended to supersede historical reading or the instructor's customary explanations to his scholars.

But it is claimed that is a most valuable, a most important, aid, in view of the hindrances by which people generally are prevented from either acquiring a competent historical knowledge, or from retaining or recalling, when wanted, what they have once known. In behalf of DeZaba's Method, its advocates set up claims which may be briefly and summarily stated as follows.

That it supplies a much felt want in rendering, as it were, time *visible*; that all the chief facts of Universal History can, through the medium of vision, be placed before the mind at one view, and any particular one be selected for examination and contemplation; that, the eye being the most active organ of sense, and as what we see for ourselves affects us more permanently than what we derive from hearsay or from reading, the impressions received concerning historical facts are more lasting: that it removes the study of History from among the difficult and irksome pursuits, rendering it attractive, and adapts it to the wants of all ages in life; and that it forms an excellent compendium for the student, affording him ready means of following an instructor or a narrative, as if by a sort of shorthand, and without overburdening the memory, or otherwise overtaxing the mind. Without referring to the charts themselves (which are accompanied by a small pamphlet or key) it would be useless to extend this account of it further.

The Chevalier has already introduced it to public notice, more or less fully and successfully, in Germany, Portugal, France, England, Brazil and some parts of the United States of America. Latterly, being en route for Chili and Peru at the invitation of their Governments, he came amongst us with the intention of spending a few weeks in Canada. He visited Quebec and Montreal, and, while at the former city, brought his Method under the notice of the Department of Public Instruction for the Province of Quebec, and of the authorities of the principal Educational Institutions; and the question is now under consideration as to the advisability of adopting it as part of our public system. His explanations, given before large audiences at Quebec and Montreal, excited much interest and attention, and were followed by the approval of the heads of numerous institutions who introduced it at once.

Subsequently he visited Ottawa, and is at present, we believe, at Toronto, in communication with the Department of Public Instruction for Ontario. At

Ottawa, the Chevalier and his Method, met with the warmest reception, and the practical utility of his system was certified by its adoption in the leading public and private seminaries. He also had a personal interview with, and enjoyed the cordial hospitality of His Excellency the Governor General, being accompanied by his accomplished daughter, Miss de Zaba. The Governor, with his customary enlightened solicitude with respect to educational matters, manifested a strong interest in the Method, and, on parting with the Chevalier, accepted a present of the chart, and presented in return, a copy of his own literary work "Life in High Latitudes", assuring the Chevalier of his good wishes for his success in advocating educational improvements.

In conclusion, although the conductors of numerous extensive Institutions in the Cities of this Province have had the opportunity of examining DeZaba's Method for themselves, yet our teachers, and others interested in Education, who are situated in the country parts, have not had the same advantage. To these, therefore, we would offer the advice to examine the Method in all its details, and to have practical recourse to it on conviction of its merit and utility. The remarks and explanations given in this article do not, of course, fully supply the means for that, but will, it is hoped, prove auxiliary. Copies of the large and small charts, and of the accompaniments, have been supplied to the three Normal Schools of the Province on the recommendation of the Council of Public Instruction.

NOTE.—We have been informed that the Chevalier de Zaba intends, prior to his departure from Canada, to establish a dépôt for furnishing the Charts, &c, required for the study of History with the aid of his Method. The cost of the large charts, for class-rooms and libraries is \$10 each, and of the small charts, with key and requisite accompaniments, about \$2 each set. These particulars will be more definitely stated in a future issue of the Journal.—Ed. J. Ed.

MISCELLANY.

Marvels of Memory.—Instances of a remarkable memory, generally supposed to be assisted by mnemotechny, have been given from the time of Cicero, who concludes that memory is not, therefore, of the heart, blood, brain, or atoms; whether of air or fire he is not, like the rest, ashamed to say he is ignorant; he undertakes, however, to swear that it is divine, having regard to such men as Cineas, the Ambassador of Pyrrhus, who saluted the Senate and all the people by their names the second day after his arrival at Rome; of Theodectes, the disciple of Aristotle, and of Hortensius, a man of his own time. We have most of us heard of Joseph Scaliger, who learned the twice twenty-four books of the *Iliad* and *Odyssey* in three weeks; of Avicenna, who repeated by heart the whole of the Koran at the age of ten; of Lipsius, who was willing to recite the histories of Tacitus word for word, giving any one leave to plunge a dagger into his body if he made a mistake—and idle license, for few would have cared to run the resultant risk; of the youth of Corsica of good appearance, mentioned by Muretus who recited all the barbarous words the latter had written till he was tired of writing, and stopped at last, as it was necessary to stop somewhere, while the youth, like Oliver, asked for more. "Certainly," says Muretus, "he was no boaster, and he told me he could repeat in that way 36,000 words. For my own part I made trial of him after many days, and found what he said, true." This Corsican, as those others, was no doubt of a soul disdainful silver and gold, or he might have made his fortune by offering his services to an Emperor. Of Frances Suarez, who, after the witness of Strada, could quote the whole of

Augustine (the father's works would fill a small library,) from the egg to the apple. Of Dr. Thomas Fuller, who could name in order all the signs on both sides of the way from the beginning of Pater noster row at Ave Maria lane to the bottom of Cheapside to Stock's Market, now the Mansion House. Of Magliabecchi, whose name is pleasantly and permanently associated with spiders and the proof of the lost MS. Of William Lyon, who for a bowl of punch, a liquor of which he was exceedingly fond, repeated a *Daily Advertiser*, in the morning, which he had read once only, and then in the course of a debauch over-night.

We might extend this paper far beyond its normal dimensions by mention of such names as Jedediah Buxton, who, if his witness be true, could by some strange mnemotechny of his own, multiply thirty-nine figures by thirty-nine, without paper, and amused himself when at the theatre by a compilation of the words used by Garrick, and at another time by that of the pots of beer drank during twelve years of his life; of Zerah Colburn, a mere child, of whom there remains on record a testimony that he could tell the number of seconds in fifty-eight years in less time than the question could be written down; or of that prodigy of parts, Pascal, to whom reference was made at the beginning of this paper, who is said to have forgotten nothing thought, read, or done during his rational age. This, says the author of the essay on the *Conduct of the Human Understanding*, is a thing so wholly inconsistent with our experience of human nature that to doubt it is no reprehensible stretch of skepticism.—(*Cornhill Magazine*)

Macaulay's Memory.—The late Lord Macaulay had a most extraordinary memory, and he was all his life an enormous devourer of books on all sorts of subjects, and in many languages, he was qualified to talk down any man in England, and did talk down most of his acquaintances. His flashes of silence, like angel visits, were few and far between. We are told that he could repeat all the old Newgate literature,—hanging ballads, last speeches, and dying confessions,—while his memory of Milton was so accurate that if his poems were blotted out of existence, they might have been restored from his memory. Moore relates that breakfasting one morning with Monckton Milnes, to meet Hallam and Macaulay, the latter opened quite a new chapter of his marvellous memory, astonishing as much as amusing them, which was no other than his knowledge of the old Irish slang ballads, such as "The night before Larry was stretched," &c., and many of which he repeated as glibly as Moore could in his boyhood. "He certainly obeys most wonderfully Eloisa's injunction," said Moore. "Do all things but forget."

Macaulay was fond of rummaging old book-stalls, and scarcely a dusty old book shop in any by-court or out-of-the-way corner in London escaped his attention. He would mount a ladder and scour the top shelves for pamphlets and curious relics of a bygone age, and come down, after an hour's examination, covered with dust and cobwebs. He was not communicative to book-sellers, and when any of them would hold up a book, although at the other end of the shop, he seemed to tell from the cover or by intuition what it was all about, and would say "No!" or "I have it already!" before the dealer could ask whether he would look at it. If he purchased anything, he was so impatient to have it at home that he would tuck it under his arm, and act as his own porter. He was passing one day through the Seven Dials, where he bought a handful of ballads from a dealer who was bawling out their contents to a gaping audience. Proceeding on his way home, he was astonished, on suddenly stopping, to find himself surrounded by half a score of urchins, their faces beaming with expectation. "Now then," said Macaulay, "what is it?" "Oh, that is a good un," replied the boys, "arter we've acome all this way." "But what are you waiting for?" he asked, astonished at their familiarity. "Waiting for? Why to hear you sing, to be sure!"—*Scribner's*.

Growth of a language.—The extraordinary spread of the English language over the globe at the present time, and during the past century, is a matter which deserves the thought of all intelligent men. The *Scottish American Journal* calls attention to some points of interest in regard to it:—

1. The English language is to-day spoken by more people than speak any other European language.
2. The English is the only language in the world that is the speech of two great civilized powers.
3. If our language spread as rapidly during the next as it has during the past hundred years, it will in another century be spoken by nearly as many people as now inhabit the entire surface of the globe.

Our first point may appear surprising to people who have never thought of it; but its truth is indisputable. The Russian empire, with its eighty millions of population, will at once come to the minds of most people in the way of objection. But it must be remembered that the Russian language is not by any means the speech of the whole of the Czar's subjects. In all the vast Asiatic provinces of Russia, from those in the far North to Georgia in the Southern Caucasus, Asiatic languages predominate; and if, besides these, we should preclude the Polish and some other provinces, it will be found that the Russian tongue proper was not spoken by more people than one-half of the population of the empire. The English is spoken by one-third more people than speak German, including the Germanic population of Austria. It is spoken by twice as many as speak French, and by nearly twice as many as speak Spanish, including those of the Spanish-American States. Of course the language of none of the other European countries from Norway and Holland to Italy and Turkey, can be compared with it in this respect. We must go to the Asiatic continent, among the Chinese and Hindoos, to find another language spoken by as many men as speak the English to-day.

Our second point only requires us to mention the British kingdom and the American republic as the two English-speaking powers. German, beside being the language of the German empire, is spoken by a part of the population of Austria; but it is only one of the score of Austrian languages, and is of less consequence than the Hungarian, the Czech, and several others. Spanish is spoken by one second-class European power, and it has a foothold in Mexico, and in half a dozen petty States of Central and South America. French, beside being the language of France, prevails extensively in Belgium. But these facts furnish no exception to the statement that English is the only language that is, at this time, the speech of the civilized world. We say nothing here of the fact that it is also the speech of numerous British Colonies, from the New Dominion and the West Indies to Australia and South Africa.

The third point which refers to the result that will ensue from another hundred years' growth of our language equal to that of the past hundred years, is not a pure piece of exaggeration or sensationalism. We offer no opinion as to its future career; for we are aware that if there are reasons for believing in, there are other reasons for doubting, the continuance of the extraordinary rapidity of its growth. But of the result of such continuance, during the period of time indicated, there is no doubt. A century ago, the English language was spoken, we may say, by about ten millions of mankind,—seven in Great Britain, and three in the American colonies. To-day, it is spoken we may say, by nearly a hundred millions,—thirty-two in the British Isles, forty in the United States, three in the New Dominion, two in the Australian colonies, one in the West Indies, one in the African colonies, four or five millions in the East Indies and other parts of Asia (including the natives who have acquired it), and several millions in other possessions, or in commercial parts of the globe, which numbers, added to some others that might be indicated, will run up its numerical volume to somewhat near a hundred millions. It is evident, therefore, that if this language, which, in the days of our great-grandfathers was the speech of but a few million British Islanders and British American colonists, were to move for the next with any such sweep as it has moved for the past hundred years, if, in that period, it should multiply its speakers more than ten times, it must then be spoken by a population not far short of the ten or twelve hundred millions that now inhabit the world.

Astronomical Science.—*New Survey of the Northern Celestial Hemisphere*.—We learn from the *Revue Scientifique*, of Paris, that a new survey of the northern celestial hemisphere is in course of execution by the astronomers of the present day. The first was performed by the celebrated Lalande from 1785 to 1798; the Sicilian Piazzi came next; Bessel revised Lalande's catalogue of stars in 1821, and finished his labours in 1833; Argelander, aided by Schoemeld and Krueger, undertook the observation of all the stars visible at Bonn, and not below the tenth magnitude. This enormous work, comprising 342,127 stars lying between the North Pole and the second degree of south latitude, was finished in 1863. Both such surveys must be renewed at intervals; mistakes may have slipped in, omissions may have to be supplied and certain stars supposed to be fixed, may turn out to be planetary in some other system than our solar one.

A new revision has therefore been commenced under the auspices of the German Astronomical Society, and fourteen

observatories have responded to the appeal, viz, Pultowa, Dorpat, Kazant, Helsingfors, Bonn, Leyden, Cambridge, Leipzig, Neuchatel, Mannheim, Berlin, Christiana, Chicago, Cambridge, United States, and Palermo. That of Pultowa, Russia, has undertaken the observation of the 529 fundamental stars considered necessary for the new catalogue. At Dorpat, Russia, M. Schwartz has assumed the survey of the zone lying between the 70th and 75th degrees north declination; it contains 6,777 stars. At Helsingfors, Russia, MM. Krueger, Fabritius and Levoennen are engaged in revising the zone 50-05 degrees north declination, at Bonn, MM. Thiele and Schoenfeld have assumed the same task for 40-50 degrees; at Leyden, M. Kaiser does the 30-35 degrees; at Harvard College, Cambridge, United States, Mr. J. Winlock has chosen the 50-55; the Observatory of Trinity, Cambridge, takes the 30-45; at Leipzig, M. Bruhus surveys the 10-15; at Neuchatel, M. Hirsén observes the 20-40; at Berlin, M. Anwers sweeps the 14-25 zone; at Christiana, Norway, Mr. C. Fearnley performs the same task as M. Schwartz at Dorpat; the 75-80 is done at Kazan by M. Kowosky. All the zones hitherto named may be considered in their last stage of completion. The following are less advanced:—Mannheim, M. Schoenfeld, the 4-10 zone; Palermo, M. Cacciatore, that lying between 1 degree north declination and 2 degree south declination; lastly, M. Safford Chicago had observed 9,300 stars of the 35-40 zone northern declination, when the terrible fire of 1871 put a stop to his labours, and it is not to be foreseen when he may resume them in that city.

Fifteen Follies.—To think that the more a man eats, the fatter and stronger he will become.

To believe that the more hours children study at school, the faster they learn.

To conclude that if exercise is good for the health, the more violent and exhaustive it is the more good is done.

To act on the principle that the smallest room in the house is large enough to sleep in.

To argue that whatever remedy causes one to feel immediately better, is "good for" the system, without regard to more ulterior effects. The "soothing syrup," for example, does stop the cough of children, and does stop diarrhoea, only to cause a little later alarming convulsions, or the more fatal inflammation of the brain, or water on the brain; at least it always protracts the disease.

To commit an act which is felt in itself to be prejudicial, hoping that somehow or other it may be done in your case with impunity.

To advise another to take a remedy which you have not tried yourself, or without making special inquiry whether all the conditions are alike.

To eat without an appetite, or continue to eat after it has been satiated, merely to gratify the taste.

To eat a hearty supper, for the pleasure experienced during the brief time it is passing down the throat, at the expense of a whole night of disturbed sleep, and a weary waking in the morning.

To remove a portion of the clothing immediately after exercise, when the most stupid drayman in New-York knows that if he does not put a cover on his horse the moment he ceases work in winter, he will lose him in a few days by pneumonia.

To contend that because the dirtiest children in the street or on the highway are healthy, that therefore it is healthy to be dirty, forgetting that continuous exposure to the pure out-door air, in joyous, unrestrained activities, is such a powerful agency for health, that those who live thus are well, in spite of rags and filth.

To presume to repeat, later in life, without injury, the indiscretion, exposure and intemperances which in the flush of youth were practiced with impunity.

To believe that warm air is necessarily impure; or that pure cool air is necessarily more healthy than the confined air of a close and crowded vehicle. The latter at most can only cause fainting or nausea; while entering a conveyance after walking briskly, lowering a window, thus exposed to a draught will give a cold infallibly, or an attack of pleurisy or pneumonia, which will cause weeks and months of suffering, if not actual death within four days.

To "remember the Sabbath day" by working harder and later on Saturday than on any other day in the week, with a view to sleeping late next morning, and staying at home all day to rest, conscience quieted by the plea of not "feeling very well."—(*Journal of Health*.)

Book Notices.

GRADED SINGERS FOR DAY-SCHOOLS.

The idea of musical study as a feature of the Public-School system, has already been agitated in our different cities. In some places it has already been introduced as an element in current School Education, but there is a vast field for improvement in the method and process used in its study found in the Public Schools. What little instruction is given in the art is often crude, and without uniformity, and consequently but little interest is felt in the study by pupils. In this respect the cities of Cincinnati and Chicago, are making the most successful efforts. The standing of the Chicago Schools in musical progress, is due to the graded system embodied in the series of "Graded Singers," by Messrs. Blackman and Whittemore. This series is in four books, graded as follows: No. 1 commences the study of singing in Primary Department, carrying the pupil through lower grades, and occupying in the Chicago Schools, about three years, time. No. 2, is adapted to Intermediate and District Schools, whether graded or not. No. 3 is a fine collection of music, arranged in three parts. No. 4 is for High Schools, and Adult classes of mixed voices.

Teachers will find these books admirable for their work, some one of them being adapted to every pupil, from Primary to High School. "Graded Singers" are issued in board covers, price 25, 50, 75 cents and \$1 respectively, and will be sent to any address, prepaid on remitting the price to the publishers, John Church & Co., Cincinnati, Ohio.

ADVERTISEMENTS.

Wanted.

A teacher to teach the English language in School district No. 3 of Cantley, Model diploma preferred. References and letter stating the wages expected, to be addressed to the

REV. FATHER McGEVY,
Cantley, Post Office, Co. Ottawa.

Assistant Female Teacher Wanted.

Wanted an Assistant Female Teacher, who can play the organ, for the Dissident School, Notre Dame de Hull, Ottawa County. Apply to the Principal, stating salary expected. Only English require.

J. H. FORDE.

Hull, 5th October 1874.

Meteorology.

Observations taken at Halifax, Nova Scotia, during the month of September, 1874: Lat: 44° 39' North; Long: 63° 36' West; height above the sea, 125 feet, by 2nd Corporal J. T. Thompson, A. H. Corps. Barometer, highest reading on the 13th..... 30.414 inches.
 " lowest " " 7th..... 29.316 "
 " range of pressure..... 1.098
 " mean for month (reduced to 32° F)..... 29.887
 Thermometer, highest reading, on the 10th..... 79.4 degrees.
 " lowest " " 23rd..... 36.7
 " range in month..... 42.7
 " mean of highest..... 68.8
 " mean of lowest..... 46.1
 " mean daily range..... 22.7
 " mean for month..... 57.4
 " highest reading in sun's rays..... 128.8
 " lowest " on the grass..... 30.0
 Hygrometer, mean of dry bulb..... 60.0
 " mean of wet bulb..... 57.1
 " mean dew point..... 53.8
 " elastic force of vapour..... 445 grains.
 " weight of vapour in a cubic foot of air..... 4.7
 " weight required to saturate do..... 1.2
 " the degree of humidity (Compl. Sat. 100). 78
 " average weight of a cubic foot of air..... 530.4 grains.
 Wind, mean direction of, North..... 4.5 days.
 " " North East..... 4.0
 " " East..... 0.0
 " " South East..... 5.0
 " " South..... 4.5
 " " South West..... 5.0
 " " West..... 2.0
 " " North West..... 5.0
 " " Calm..... 0.0
 " force by estimation..... 3.3
 " average daily velocity..... 222.7 miles.
 Cloud, mean amount (0 to 10)..... 6.1
 Ozone, mean amount (0 to 10)..... 2.1
 Rain, number of days it fell..... 12
 Snow, number of days it fell..... 0
 Amount collected on ground..... 5.14 inches.
 Fog, number of days..... 8

Synopsis of Temperature, Cloud and Precipitation for July, 1874, compiled at the Toronto Observatory, from Observations in the several Provinces of the Dominion of Canada:—

PROVINCE.	STATION.	Hours from which means are derived	Mean Temperature uncorrected for diurnal variation	Warmest day	Temperature	Coldest day	Temperature	Mean of daily Maxima	Mean of daily Minima	Highest Temperature	Date	Lowest Temperature	Date	Percentage of Cloud	Depth of Rain in inches	Number of days in which rain fell	Depth of snow in inches	Number of days in which snow fell	Total depth of rain and melted snow	Number of fair days
NEW-FOUNDLAND.	St. John's	8 A. M. 2 & 9 P. M.	59.85	28	75.00	2	41.83	67.26	50.47	83.0	29	32.0	3	61	3.440	8	0.0	0	3.440	23
			68.40	16	76.20	21	60.40	81.48	56.32	93.0	20	50.0	39	0.360	8	0.0	0	0.360	23	
P. E. ISLAND.	Charlottetown	8 A. M. 2 & 10 P. M.	63.51	16	71.60	1	51.75	73.66	56.54	87.7	16	47.7	3	56	2.786	14	0.0	0	2.786	17
			62.20	28	71.80	3	52.30	73.10	55.20	82.3	15	46.0	110	67	3.935	13	0.0	0	3.935	18
NOVA SCOTIA.	Halifax	Tri-hourly	82.45	15	69.23	3	49.91	75.56	53.51	89.0	19	43.3	3	57	2.294	16	0.0	0	2.294	15
			61.49	16	74.42	1	45.77	71.89	50.70	81.8	28	41.8	19	52	1.740	8	0.0	0	1.740	23
			62.20	28	71.80	3	52.30	73.10	55.20	82.3	15	46.0	110	67	3.935	13	0.0	0	3.935	18
NEW BRUNSWICK.	Fredericton	7 A. M. 2 & 9 P. M.	53.28	23	68.77	1	41.16	61.60	43.70	82.0	23	33.0	2	67	5.84	10	0.0	0	5.84	21
			65.62	16	76.05	3	54.35	76.40	55.20	86.2	15	47.0	23	62	1.818	15	0.0	0	1.818	15
QUEBEC.	Huntingdon	7 A. M. 2 & 9 P. M.	67.67	26	79.25	3	60.00	78.39	59.19	91.0	28	51.0	4	48	4.820	13	0.0	0	4.820	18
			65.52	26	76.83	2	53.99	74.56	57.51	87.5	26	50.1	2	55	7.320	12	0.0	0	7.320	19
QUEBEC.	St. John	Bi-hourly	59.46	17	65.00	7	52.00	66.74	53.06	78.0	9.24	48.0	7.8	66	2.820	12	0.0	0	2.820	19
			65.62	16	76.05	3	54.35	76.40	55.20	86.2	15	47.0	23	62	1.818	15	0.0	0	1.818	15
QUEBEC.	Quebec	Bi-hourly	67.67	26	79.25	3	60.00	78.39	59.19	91.0	28	51.0	4	48	4.820	13	0.0	0	4.820	18
			65.52	26	76.83	2	53.99	74.56	57.51	87.5	26	50.1	2	55	7.320	12	0.0	0	7.320	19
ONTARIO.	Fitzroy Harbour	7 A. M. 2 & 9 P. M.	71.35	15	81.60	11	65.00	80.77	66.62	92.3	15	60.0	16	47	1.390	9	0.0	0	1.390	22
			66.37	14	74.00	20	59.80	75.11	56.62	83.0	14	48.7	12	47	1.960	14	0.0	0	1.960	19
ONTARIO.	Woodstock	Tri-hourly	68.50	15	76.94	12	58.30	80.77	66.62	98.2	7	40.7	1	0	3.350	14	0.0	0	3.350	17
			66.37	14	74.00	20	59.80	75.11	56.62	83.0	14	48.7	12	47	1.960	14	0.0	0	1.960	19
PROVINCE.	Toronto	8 A. M. 2, 4, 10 & 12 P. M.	67.80	25	75.75	16	61.20	77.66	56.93	83.5	7	44.4	1	52	3.350	11	0.0	0	3.350	20
			67.80	25	75.75	16	61.20	77.66	56.93	83.5	7	44.4	1	52	3.350	11	0.0	0	3.350	20