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What Should Women Study?

By J. SCOTT RUSSELL.

Home is an English word, an English thought; it is the place of the family; the fireside and the scene of family life, of family birth, growth, culture. English life grows and shines hidden in the bosom of the family.

When, therefore, I speak of the occupation of a woman, I speak of her occupation in her sphere of "home administration." Man does his work abroad, without, in the world, in the crowd; woman's work is to organize, regulate, animate, illuminate home. There is her sphere, and in it she has work, duty, labor to do; industry, art, skill to exercise; intelligence, knowledge, to develop. Education is required, special in its object; training in arduous work, method in execution, technical education.

Woman's technical work is the organization and fulfilment of the duties of home life; and we must first examine the nature of these duties, before we can talk of the education and training they require.

The foundation of the home is marriage; the husband founds or finds the home; he brings his wife "home." He provides there shelter and comfort; and happiness is what he hopes always to find there. *She* has to make *that*. Henceforth his duties lie out of doors; hers lie indoors. He earns or gains their living abroad. He brings his earnings home weekly, monthly, yearly;

that is his business. His wife's is, to spend that money--well, or ill?

The programme then of a woman's technical duty is simply this: How shall I spend my husband's earnings in our joint home, so as to make it yield him and us the best fruit? How shall I turn these hard-won earnings to best account?

"How to administer given earnings in the wisest, homely, household way"—that is a technical question, wanting some knowledge, teaching, training, education.

The money of a home has to provide for health, amusement, instruction. It has to provide fire, clothes, food, drink, music, reading, comeliness, knowledge, training, refinement.

Ought an English wife to know any thing about fuel or not? Should she know that there is good and bad coal?—that what is sold to her as best coal is oftener bad coal than good?—that bad coal produces smoke and flame and not heat, and that the one wastes money and the other uses it? Ought a woman to know this knowledge, or is it beneath her?

I must answer once for all, that I do not think any household knowledge of this sort is beneath any well-born woman. When of two things you have to choose, whether you will do the better or the worse, it seems to me you have a grave responsibility. It seems to me, if you choose the worse, or don't choose, you are to blame. It seems to me, then, that a woman should know good coal from bad, or she may waste her husband's earnings. But next, if she buys only the best coal, comes the question: Is there a right way of using the coal and a wrong?

Ought an English wife to know how to use good coal; to use it to the purpose for which it is bought; to use it for light, cheerfulness, ventilation, warmth, cookery, cleanliness; or to use it to waste, smoke, discomfort? Is any knowledge necessary for that? Cannot anybody make a good fire?—keep a good fire, prevent smoke, maintain cheerful heat, warmth without waste?

Verily, there are few women who know this: the art to make, to maintain a good fire without excess, without waste, without smoke. Much science goes to understand a fire. 1. What is fuel made of? 2. What feeds the fire? 3. What wastes the fire? 4. What regulates the fire? 5. What makes flame? 6. What wastes heat? 7. What preserves and maintains heat? 8. What spreads it equally round a room? 9. What creates smoke, draughts, rheumatism, and colds?

It is not the work of a moment to understand and answer all these questions. A wise housekeeper should have asked them all, and got a good answer to each; that is one element of English home, health and comfort. Can every English housekeeper solve all this?

To feed her household well, agreeably, wholesomely, without stint, without waste—there is a technical problem of home life. What does each kind of food cost? What parts of food are the more wholesome, the more nutritious? What kinds of food do harm?—to the young, the middle-aged, the old? What quantity should be cooked, so as to give plenty without waste? What is the real value of each kind of food compared to its price? What is the price of food bought wholesale and bought at retail? What is the true weight of good kinds of food? How do I know good food from bad? How can I tell adulterated food from pure and wholesome food?

What are the wholesome ways of cookery? What kinds of cooking render wholesome food more or less nutritious, palatable? What dishes are comely, elegant, clumsy, gross, vulgar? How can I use the least sum of my husband's earnings in housekeeping, and yet never make him feel in want of any thing?

Shall I be told that all these things come by intuition, by experience, by practice? That they are for the servants to study, not for the mistress? That in every English household they are already perfectly well done? if I am assured that this is already known and done, I have only to admit, that no technical education in housekeeping is required by Englishwomen.

But I fear the truth is less pleasing; that many an Englishwoman sorely feels that that part of her education is at least not perfect. But I fear that many more Englishwomen and Englishmen do not know the truth about cookery and food. English food is often of the best materials in the world. English fuel is also of the best. English cookery, as a whole, is wasteful in the extreme, both of food and fuel. It is the fault of the Englishwoman; her want of technical education. She neither knows what is right, what is wrong, nor can she teach her servants what she herself is so ignorant of—the art of nutritious, wholesome, elegant, economical cookery.

Should the mother of a family know any thing about her own clothes—her husband's—her family's? What sort, quality, price of stuff, they should be made of? What stuffs wear well? what wash well? what wash out? Which parts wear out first? How to make these parts last the longest? What sewing holds? How many yards of stuff go to each piece of dress?—how much for lining, how much for trimming, how much for shaping, how much for sewing?

Should the head of a household know how to make any thing with her own hands—out of her own head? to cut out, to shape and fashion, to use a sewing-machine; to sew, embroider, mend? Should she know all about children's clothes, or nothing? Perhaps the Englishwoman we speak of may never want any of this sort of knowledge; she is born above all these things. But may I ask: Is it of no use to know thoroughly the things our servants have to do, or our shopkeepers? Should we not know when we are well served? when we are ill served? to distinguish between those who do well, and those who do ill; teach our inferiors, if they don't know; criticise their blunders, detect and correct their faults? Is it beneath the head of a household, to add to the pride of birth and the power of wealth, the excellence of superior intelligence and knowledge? Would it diminish your respect for a stately dame of a noble house, to know that she spared her husband's purse, and looked carefully after her own household? I know of a queen of ancient race, who taught her daughters to wash their own lace; for as she wisely said, "My dears, you never know what you may come to!" Was she a foolish or a wise mother?

All about clothes I think woman's work and woman's duty: price, stuff, shaping, sewing, durability, washing, ironing, and mending. A woman who cannot do all these things, and teach

them to servants and daughters by example and precept, has not to my mind got a good technical education.

There is no such physician as a wise wife or mother. Not to cure disease: that is a doctor's work: but to prevent disease, or to stop it at starting. What are our gravest illnesses?—neglected colds, indigestions, headaches. Who first finds out that we are ill? Who knows what has caused our illness? Who first takes alarm? Why should not every wife know the early symptoms of disease, the cause, the cure? There—not by the sick-bed, or in the hospital, but there, by the family fireside, the kindly mother should wisely watch the first symptoms of disease, wisely give the early warning, wisely apply the simple cure. Which is better in the house, a wise wife, or a perpetual physician? There is no technical training so valuable to a woman as that which shall enable her both to keep the doctor out of the house, and to send for him the moment he is wanted.

The most important part of the Englishwoman's home duty is still to come. The character of the next generation of Englishmen and Englishwomen is to be of their mothers' forming. Nearly all the education that forms character is mother's teaching—home education, family training. School may modify, but cannot supersede this first apprenticeship to human life. The world may cover and obscure the marks of mother's breeding: that early growth can never be uprooted!

If, then, the mother's teaching founds the future character, sows the early seeds of feeling, plants the first roots of principle, settles the tendencies and aims of life, grounds habits, prunes error, weeds out follies, checks faults, develops hidden talent, encourages native energy to steady application, and makes good the weak places of the young human creature—what afterthought, and pains, and toil, and painful undoing and still more painful regret, may not a wise mother spare her children's lives! What glorious privileges may she not confer on these young human souls, making of them treasures for their friends, their home, their country, and their God?

All nature is a book—a child's book. Its mother is nature's best interpreter, if only she first knew!

A mother's teaching, home education, family training—what a wide field of mother's work—all a child should know, all that its mother should be able to teach!

I have spoken only of infancy, of the first six or seven years, when as yet the school is not, and the teacher has not entered on the scene. If the mother's work must now cease, how glad will she be if she has done it well, and how grateful her children ever after! But must it now cease? Can a mother after seven be of no more help to her boys or girls—teach them no more? Let the mother herself say: can she help her boys in the evening, or in the early morning, with their figures, their reading, their exercises?

For my part, I doubt much if girls blessed with such a mother need ever go to school, or could ever better themselves by it. I am quite sure that a man would far rather marry such a mother's girl than the best boarding-school miss of the most fashionable girl's school.

But even if mothers do not or cannot teach all their children all they should know, of how great advantage to initiate, to choose, to watch the education! What teachers would grow up under the inspection of well-taught mothers for the education of their well-prepared children! Thus every knowledge of the mother proves a treasure to her child.

On Traces of the Early Mental Condition of Man.

BY EDWARD BURNET TAYLOR, ESQ.

(From the Transactions of the Royal Institution of Great Britain.)

If an antiquary is asked his opinion as to the early condition of mankind, he will probably take up the question with reference to an excellent test of man's civilization, the quality of the tools and weapons he uses. He will show how, within our own knowledge, the use of metal instruments has succeeded the use of

sharpened stones, or shells, or bones, how the stone axes and arrow-heads found buried in the ground prove that in every great district of the world a Stone Age has prevailed at some more or less remote period; and lastly, how recent geological researches have displayed to us the traces of a Stone Age extraordinarily low and rude in character, and belonging to a time as extraordinarily remote in antiquity. The history of man, as thus told by a study of the implements he has used, is the history of an upward development, not indeed a gradual steady progress of each family or tribe, but a general succession of higher processes to lower ones.

Now there also exists evidence, by means of which it is possible still to trace, in the history of man's mental condition, an upward progress, a succession of higher intellectual processes and opinions to lower ones. This movement has accompanied his progress in the material arts during a long but undefined period of his life upon the earth; and of this evidence, and of the lines of argument that may be drawn through it, the object of the present discourse is to give a few illustrative examples.

I. In the first place, the *art of counting* may be examined from this point of view. We ourselves learned to count when we were children, by the aid of a series of words, *one, two, three, four*, and so on, which we were taught to associate with certain numbers, 1, 2, 3, 4, and can thus reckon up to the largest imaginable number, and down to the smallest imaginable fraction. But if we look round among other tribes of men we find a very different state of things. As we go lower in the scale of civilization, it becomes easier and easier to puzzle a man with the counting of 20 objects, or even of 10, and to drive him to the use of nature's counting machine, his fingers. When we reach the low level of the savages of the Brazilian forest or of Australia, we find people to whom 3 or 4 are large numbers. One tribe described by Mr. Oldfield, reckoned *one, two*, and then *bool-tha*, "many," but when their poor word-language fails them they fall back on gesture-reckoning. Mr. Oldfield tells us, for instance, how he got from a native the number of men killed in a certain fight. The man began to think over the names, taking a finger for each, and thus, after many unsuccessful trials, he at last brought out the result by holding up his hand three times, to show that the number was 15.

Now our words, *one, two, three, four*, &c., have no etymology to us, but among a large proportion of the lower races numerals have a meaning; as among many tribes of North and South America and West Africa are found such expressions as, for 5, "a whole hand," and for 6, "one to the other hand;" 10, "both hands," and 11, "one to the foot;" 20, "one Indian;" and 21, "one to the hands of the other Indian;" or for 11, "foot 1;" for 12, "foot 2;" for 20, "a person is finished;" whilst among the miserable natives of Van Diemen's Land, the reckoning of a single hand, viz 5 is called *puganna*, "a man."

For displaying to us the picture of the savage counting on his fingers, and being struck with the idea that if he describes in words his gestures of reckoning, these words will become a numeral, perhaps no language approaches the Zulu. Counting on his fingers, he begins always with the little finger of his left hand, and thus reaching 5, he calls it "a whole hand;" for 6, he translates the appropriate gesture, calling it *tatisitupa*, "take the thumb," while 7, being shown in gesture by the forefinger, and this finger being used to point with, the verb *komba*, "to point," comes to serve as a numeral expression, denoting 7.

Now, though many numerals, especially fives, tens, and twenties, were named from the fingers, hands and feet, this is far from being the only source of numerals. Many centuries ago, the Hindu scholars, besides their regular series, made a new set of words to serve as a sort of *memoria technica* for remembering dates, &c. Thus, for 1 they said "earth" or "moon;" for 2 "eye," or "arm," or "wing;" for 3, "Rama," or "fire," or "quality"—there being considered to be 3 Ramas, 3 kinds of fire, 3 gunas or qualities; for 4 "age" or "veda" because there are 4 ages and 4 vedas. One line of an astronomical formula will show the working of the system:

vahni tri rtwishu gunendu kritagnibhûta:

That is to say:

"Fire, three, season, arrow, quality, moon, four of dice, fire element."

That is 3 3 6 5 3 1 4 3 5.

When Wilhelm von Humboldt, more than 30 years ago, looked into this artificial system of numeration, it struck him that he had before him a key to the general formation of numerals. When a Malay, he said, calls 5 *lima*, that is, "hand," he is doing the same thing that the Hindu pandits did when they took "wing" as the numeral for 2; and then, he suggested, the numeral words having thus been once made, the sooner their original meaning was got rid of and they were reduced to the appearance of mere unmeaning symbols, the better it would be for their practical use in language. Now a number of actual facts may be brought forward in support of Humboldt's far-sighted suggestion. The Abipones of South America counted to 3, and for 4 said "ostrich toes," from the division of their ostrich's feet; then, for 5, "one hand;" for 10, "two hands," and so on. In Polynesia there is a regular set of decimal numerals, but sometimes, for superstitious reasons, they turn words out of their language for a time, and have to use fresh ones. Thus, in Tahiti, they ejected *rua* 2, and *rima* 5; and in a missionary translation of the Bible we find *piti* and *pae* instead; now *piti*, the new word for 2, means "together," and *pae*, new word for 5, means "side."

In other South Sea islands, the habit of counting fish or fruit one in each hand has led to *tauna*, "a pair," becoming a numeral equivalent for 2; the habit of tying bread fruit in knots of 4 has made a new numeral, *pono*, "a knot," while other terms for 10 and 100 have had their origin from words meaning "bunch" and "bundle." And so, even in European languages, numeral words break out from time to time, ready to become proper numbers, should a vacancy be made for them in the now meaningless series, *one, two, three, four*. Thus in English we have *pair* or *couple* for 2, and *score*, that is "notch," for 20. The Letts count crabs and little fish by throwing them 3 at a time, and thus the word *mettens*, "a throw," has come to mean 3, and so in many other cases in other languages.

Now when tribes count by saying *hand* for 5, *take the thumb* for 6, *half a man* for 10, and so on, it is evident that the basis of their numeration is finger counting. But there is also evidence in the systems of numeration of most civilized languages that they, too, are the successors of a rude unspoken system of gesture counting. The rule of the whole world is to count by fives, tens and twenties; the exceptions are so late or so incidental that we may neglect them and say that the original counting of mankind is the quinary, the decimal, or the vigesimal system, or a combination of these. We need not go abroad for examples. In the Roman numerals, which count to V, and then begin again VI, VII, we have the quinary system. The decimal system is our familiar one. And when we speak of "threescore and ten," "fourscore and thirteen," we are counting by the vigesimal system, each "score" or notch, thus ideally made, standing for 20, for "one man," as a Mexican or Carib would put it. It is a very curious thing that both we and the French, having two good decimal systems of our own, should have run off into vigesimalism. Why should we have ever said "fourscore and thirteen" for the 93, which we have good Saxon tens to express? and why should they say in France, "quatre-vingt-treize," instead of holding to the Latin original of their language, and saying "nonante-trois?" The reason seems to be that counting by scores is a strongly marked Keltic characteristic, found in Welsh, Irish, Gaelic, and Breton, and has been taken up into the alien numeral systems of France and England. At any rate, the rule of the world is to count by fives, tens, and twenties; and the connection of this rule with the practice of counting on the fingers and toes will hardly be disputed. Indeed the remark has often been made that the fact of our having 10 fingers and 10 toes has led us into a system which is actually not the best; while if we had had 6 fingers on each hand, and 6 toes on each foot, we should probably have taken

to using, like the carpenter, the more convenient system of duodecimals.

These are examples of the facts which tend to show that man's early way of counting was upon his fingers; as Massieu, the Abbé Sicard's celebrated deaf and dumb pupil, records in describing recollections of his yet uneducated childhood: "I knew the numbers before my instruction; my fingers had taught me them. I did not know the ciphers. I counted on my fingers." Among the lower races, the use of word language has only to a small extent encroached upon gesture language in counting; among races above these, numeral words are more largely used but preserve evident traces of a growth out of gesture counting; while among the higher peoples, though language gives little trace of the original signification of numerals, there still prevails the system of counting by fives, tens, and twenties, of which we can hardly doubt that the form is given by the arrangement of the fingers and toes. Thus it appears that in the mental history of mankind we may see back to a condition so much lower than our own, that the numerals, which we look upon as so settled a part of speech that we use them as one of the first tests of the common derivation of languages, were still unspoken, and their purpose was served by the ruder, visible signs which belong to the department of gesture.—*Smithsonian Report*.

A Paper Read at a Conference of Irish National Teachers held in Dublin, Dec. 30, 1869.

NIGHT SCHOOLS

Or the Education of the Adult Village Labourer.

(BY M. O'GRADY.)

At our last congress our respected chairman, at the conclusion of his opening address, expressed a hope that something would be heard on the desirability of night schools; but, as nothing was then or there said on the subject, I have thought proper to write this essay upon it, in the hope, if you do not think it worthy your consideration, that you will award to the writer that to which he only aspires—the credit of a good intention.—As the education of the humbler classes enriches the mass of society, what better use can be made of wealth than to multiply the rational and innocent pleasures of the poorer classes, to improve their taste and to elevate their character? To do this, it appears to me that no more effectual means could be adopted than the establishment of night schools. We know that the education of the adult laborers and tradesmen has occasionally received a little public attention. Many educationists and philanthropists have grappled with the subject, both through the agency of the press, and by practically organizing and conducting evening schools. The instances which have proved successful are much fewer than might be expected—a fact which must excite astonishment when it is considered that the attempts have been almost confined to large and populous towns. Only a few isolated attempts have been made to establish village evening schools, or any other means by which the adult labourer, no matter how well inclined, could turn from the tilling of the soil to the cultivation of his mind, and thus raise his condition as an intellectual being. The merest rudiments of literary or scientific knowledge confer on man great benefits. Even the ability to read, opens up new channels of rational employment to the mind by limiting the temptations that bestrew the paths of the laboring multitudes. When the seeds of knowledge are sown amongst them, they are sure to burst the bonds that fetter them to ignorance. The smallest amount of education opens avenues to employment on which the uneducated mind can never enter; and the mind of the artizan or labourer having once gained access to the knowledge contained in books, can always find employment for his leisure hours, which will tend to ameliorate his condition. The more the mind is exercised the stronger it becomes. The more knowledge is acquired the more the capacity and facilities of knowledge are increased. The more the

taste for intellectual pleasures is cultivated the less likely is man to become the slave of his lower appetites and passions. Then what a great gain will it always prove to the labouring classes, if labour can be something more than mere mechanical drudgery and toil!

Whilst you will fully subscribe to these sentiments I know you will also feel that powerful barriers impede the labours of the educationist in his endeavours to instruct the adult labouring man; and that you are anxious that in cities, towns, and villages, much should be done—indeed that everything should be done which can be done—to educate and elevate them. I know you wish they should be treated, not as they are too often treated, as mere animals and machines, to be used and applied as masters and employers have the power and inclinations to use and apply them, but as beings who have minds as well as bodies—minds destined to be immortal; and who should be rendered capable of self-direction. I know you do not think that their duty would be less faithfully, because more intelligently, performed; and that, in order to see such carried out, I believe you would rejoice to see the best means adopted, which, to me, appears to be the universal establishment of evening schools in this country. I shall now venture to trace the indifferent success of most of the evening schools that have been established, and suggest a remedy. Foremost stands the want of either support or sympathy from any influential persons, and second, the principles on which they were conducted.

The clergyman, the landlord, the agent, the Board of National Education, and others could, by their united influence, render signal service to the movement. It appears to me that evening schools, in order to be at all successful, must be conducted on principles totally different from ordinary schools.

We know that a social reform cannot be effected in the adult sons of toil, by attempting to afford them systematic class instruction. A taste for literature cannot be engrafted on a mind whose ideas have been already shaped. The former cannot be accomplished without the combined agency of various social measures, and the latter naturally comes within the province of early education. But though we should recommend that the friends of education should concentrate their energies on the young mind, yet we believe that much service may be rendered to the adult population by judicious efforts, and that these efforts will prove successful in proportion as the ordinary class instruction is judiciously dispensed with.

The agricultural mind is still at a low ebb, it must be raised by gradual and continual exertion, and improved culture, before it can be capable of taking advantage of such means of instruction as would be offered it through classes. For many, at first, I know no means so likely to arouse them and draw their attention to better things, as simple and interesting lectures on *common things*, at first explaining principles and their application, and showing how much philosophy there is, and how much skill there ought to be, in the most common and ordinary processes of life. You know if we wish to raise up ignorance, we must descend to it. We must gather up and foster the mutual affinities and sympathies of humble life, and enlist them on our side. We must give prominence to the reasonableness and practicability of the truths and principles we would impress upon the minds of those whom we wish to raise.

To any person who reflects on the toil, and consequent fatigue of the working man, it must be evident that he cannot be expected to forego recreation, and spend several hours at the desk of an evening school. For him it should be our great object to popularize and sweeten knowledge, in order that he may be induced to come, and allay a thirst which his mind must feel. It becomes necessary to do this else he is in danger of falling a victim to the village alehouse, the rustic gambling table, or perhaps degraded associates. If the state incur the trouble and expense of giving him an early education, she must second it by supplying intellectual food; she cannot negative the taste she has created, and hence the necessity for the library and evening schools.

We have learned one great and important lesson from agriculture, which has conferred the greatest benefit upon the art, that when, as in subsoiling, the lower strata are loosened, their superabundant moisture drained off, and the air admitted, they become prepared to be mingled with the surface soil, and thus the whole is enriched, and its productiveness greatly increased, so in society, just in proportion as the humbler classes are educated, improved and educated, the whole mass of society is enriched and benefited.—*Irish Teachers' Journal*.

The Sheffield Scientific School of Yale College.

The importance of scientific and technical education is generally acknowledged both in this country and in Europe. Old systems have been forced to yield in some measure to the current of popular opinion, and at the present time there is quite a number of scientific and technical schools established in various parts of the country.

It is no fault of these schools that the common school instruction has not as yet been modified to fully accord with modern views on this subject. It is doubtless the proper purpose of common school instruction to supply a knowledge of reading, writing, and arithmetic, with an outline of grammar and geography. These simple and homely tools, especially the three first, are all important to subsequent success in business or study. But they are by no means the only benefits which the common school should afford.

A mind trained to habits of minute and accurate observation, and to the analysis of things and events, is of more importance than a knowledge of either or all of the elementary branches now taught. With a mind so trained, a knowledge of whatever is necessary to future progress, not only can be, but *will be* obtained. We hazard the opinion that no youth possessing this quality of mind in a high degree, combined with physical health, ever failed to rise above the common acquirements.

But while the pupil is mastering the elements of reading, writing, arithmetic, etc., his faculties of observation and analysis may not only be cultivated, but in so far as they are cultivated, in so far will his progress in any and all branches of study be facilitated. It is foreign to our purpose to elaborate arguments to substantiate this proposition. It will, undoubtedly, be confirmed by the opinions of all those who have attained eminence as instructors, or who have made the human mind the subject of careful study.

If this be a fact—and if, as we believe, the presentation of natural objects to the eyes and minds of pupils for inspection and minute examination, be the best and most natural means of cultivating the power and habit of conservation—it follows that this sort of training cannot be begun too early or persevered in too long. The place then for the commencement of natural science teaching is the common school; the place for its continuance and more extended employment is the high, or grammar school, and the college and university should only complete it so far as aid of special appliances and instructors are concerned. A graduate thus trained will not only be competent but disposed to continue his progress without special aids other than those which he can himself supply.

The subject of technical education in all its bearings is one that cannot be discussed in brief. Our present purpose is to show that while we have a number of institutions specially set apart for scientific instruction of the most thorough kind, and fitted out with the most improved apparatus, and with ample collections of specimens to facilitate study, they are, some of them even thus early, languishing, because, through the inattention to early scientific training, the tastes of a majority of our young men and women are turned to other pursuits.

The scientific schools which seem to prosper most are those which devote themselves to special departments, as engineering or mining or both. Some of those intended to furnish facilities

for the pursuit of all departments, of scientific study, can hardly yet stand alone. The reason for this is that the large corps of professors necessary to conduct the several departments require for their support more than can be realized from the tuition of the students and the income from their endowments. Institutions so situated are troubled to retain the proper talent in the different professorships, and the grade of ability would be speedily lowered, were it not that in some notable cases, there have been found able men willing to forego positions of honor and emolument rather than to see the cause of sound scientific education suffer.

Such a case is presented in the present condition of the Sheffield Scientific School, at Yale College. This school is intended to provide a special professional training for the engineer, chemist, naturalist, etc. Through the gifts of various liberal donors it is possessed of an endowment of \$420,000. The corps of professors is large, and the apparatus, building, etc., have been much enlarged since the erection of the first structure—Sheffield Hall, so called from the founder of the school, Mr. Joseph E. Sheffield, of New Haven.

An effort is now being made to increase the endowment of the school by \$250,000, in order, as the committee state in their circular letter, "to perfect their plans for giving a college training based on modern studies for modern avocations." They further state that "they do not propose to employ any paid agency, or to use any personal pressure in securing this amount, but they ask the influence and aid of all who think that the country will be benefited by the maintenance of this undertaking. The sums now collected will not go into "bricks and mortar" but will be permanently held as an Instruction Fund to carry on and improve the education now given."

The Committee are Professors Daniel C. Gilman, Geo. J. Brush, and Chester S. Lyman. We sincerely hope that their appeal to the generous friends of "Good old Yale" and the friends of education everywhere in America, may result in securing the full amount required to carry out the plans of the institution they represent.—*Scientific American*.

Do Farmers Study Enough?

The subject of agriculture is one that demands full as much attention at the hands of the reading public as it gets. Indeed, no theme presents itself that is fraught with more real import, so far as regards our prosperity, than the wants of the agricultural world. What we mean by attention, is a studious, careful search for the best way of accomplishing certain desired results, not a superficial investigation of some theory, merely for the purpose of creating differences or provoking discussion. The day has happily passed when being a farmer was synonymous with being a blockhead. It requires something more than mere physical strength to keep up with the advance of the age, in farming as well as in science. Many of the systems of fifty years ago are no more applicable to the demands of to-day than would be an ox team to run an opposition freight line across the plains. The farmer who reads much, and reads that much with care, is the one who stands in advance in intelligence, influence, and prosperity.

Science can aid the farmer in raising wheat or corn just as much as it can aid the miller in grinding it; and the science to be applied in agriculture is nothing more than a study of the composition of soils and the properties that are drawn from them by certain grains. All this cannot be done in a day any more than a physician makes himself thorough and successful by staring at a drug store. Study, in both instances, sustained by judgement and experience, produces the desired result.

The man of to day, who conducts his farm upon the same principle as did his grandfather, is doing himself an injury. First, because the old system does not apply; and second, land that is worth from \$50 to \$100 per acre needs to be used with more care, needs to be tilled better, than land that is worth but \$10 or \$20; upon the same principle that the more capital invested

the greater should be the income. On some of the choicest land in our State men are found who plough, year after year, the same "lots" their fathers ploughed before them, and are continually grumbling because their crops are small. They accuse their seed, the weather, everything—overlooking the great fact that certain necessary chemical properties have been literally sucked out of the soil.

This desired study does not depend upon reading alone; men often study each other. Let agricultural societies be formed whose avowed object is the dissemination of practical information. At this society let there be a full discussion of each other's wants. Let them call in assistance of scientific men, throwing away the old notion, that there is no community between the college bred man and the farmer. Science can assist in raising the grain upon the fertile intervals of the Champlain Valley, as well as the brawny ploughman who turns up the soil.

It is too often the case that such appeals to the farming community are regarded in the light of "buncombe." This ought not to be. The farmer should cure himself of the idea that reading and study are incompatible with his calling, and he should never again be heard to say that "John is going to college and Jim has got learning enough, because he's going to be a farmer." Instead of all this, let him labor to give dignity to his calling. Do not impress upon the mind of poor "Jim" that his education should stop when he is able to write his name. Make him understand that the investigation of important matters relating to his calling is something that he can do for himself. Make him understand that if he walks in the dark it is his own fault.—*Free Press.*

**On the Partial Eclipse of the Sun
August 7, 1869.**

By C. SMALLWOOD, M.D., LL.D., D.C.L. (1)

The varied and beautiful phenomena presented in an Eclipse of the Sun, form an important era in the life and study of the astronomer. They form a sort of triumph of his science, a winning-post, planted as it were, in the distant confines of space—a point of time graven on the history of the past—a land-mark placed as a beacon for the future—and a song of praise to Him, whose power and might are so manifest in the "Heavens that declare His glory, and in the moon and stars that He has ordained."

The occurrence of a total eclipse gives rise to appearances which have excited the admiration and wonder of the inhabitants of the earth in all ages; but the increase of knowledge, and a more definite theory of the properties of light, and the various improved and modern appliances of science for the investigation of these phenomena, have shed a bright lustre around these observations of a character at once sublime and of intense interest.

No experiments since the days of Newton, but the discovery by Fraunhofer of the dark lines in the solar spectrum, with the more recent invention of the spectroscope, could have led to those results which the total eclipse of last year, 1868, so fully determined, and which would seem to afford such positive proofs of the composition and nature of those protuberances, which, up to that time, had caused so much speculation among men of science.

We are not aware to what point of investigation these several objects have been brought during the past month by our American scientific brethren, or by the two or three Canadian observers who have been enabled by the liberality of the Dominion Government to witness and record, in a more favorable locality, those interesting phenomena which may justly be deemed physical and astronomical, apart from those which may be termed photographic, which, indeed, are only of a secondary, and less important character.

The recent investigations of Huggins and Lockyer on the sun's envelope, show that it is not necessary that an eclipse should take place for the observation of these peculiar and hitherto mysterious prominences, the spiral form or rotary motion of which remind us of those similar forms of nebulae, which Lord Ross has so well delineated from actual observation in his six-foot reflector.

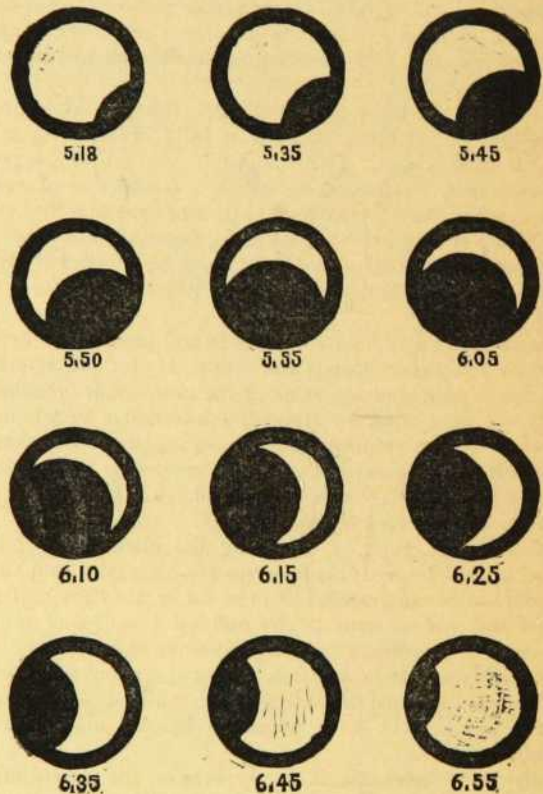
As far back as the eclipse which occurred on the 24th June, 1778,

(1) This Article is substantially that which was communicated by Dr. Smallwood to the "Canadian Naturalist" soon after the occurrence of the Eclipse. The paper had been previously read before the American Association for the Advancement of Science, by Dr. B. Edwards, of Montreal, at Dr. Smallwood's request, and was received with marked respect and gave rise to an interesting discussion upon the phenomena observed.

and was observed at sea by the Spanish Admiral Don Antonio Ulloa, these prominences were seen, and by him described as possessing rotary motion.

The observations here recorded were carried out at the Magnetic and Meteorological Observatory at this place, (Montreal,) latitude 45°31' N., and longitude 4 hours 54 m. 17 sec. West of Greenwich, and 182 feet above the mean sea level. Mr. Black kindly consented to act as assistant and time-keeper, an office he very faithfully and vigilantly fulfilled. Mr. Balch, one of the students in Arts, received some instructions, which he carried out at Tadoussac, while on a visit to that place.

The Observatory possesses no telescope which could be used with advantage: a 42 in. Dollond, 3 in. aperture, with a power of 40, was the only one which was available. A small comet-seeker, of about the same power, possessing a large field, was also brought into requisition. The screen glasses used in both cases during the whole time were red.



The first contact took place at 5 hours 7 min. 41.5 sec., Montreal mean time. The position at the telescope was taken at 5 o'clock, and my assistant was very exact, and marked well the calls and signals previously fixed upon. There was a slight agitation of the sun's limbs a second or two before the first contact occurred: it seemed as though the edge of the sun became suddenly lighted up as it were with rose-coloured prominences, shooting out coruscations of the same rose-coloured light towards the sun's bright disc, which display instinctively led to the strict observance of the position of the first point of contact. The contrast between the sun's bright disc and these rose-coloured protuberances was very distinct and well marked. The colour (as seen through the red screen) reminded me much of the *Strontian* light in a display of fire-works. These prominences increased, seeming to precede the moon's dark edge as a narrow band during the whole time, and preserving the same distinct rose colour.

The magnitude of the obscuration was 9½ digits, and was on the south side of the sun. The greatest obscuration occurred at 6 hours 6 min. 41 sec. The final contact, which occurred at 6 hours 58 min. 41 sec., was, from its position, hid from view.

Mr. Notman the photographic artist, made, at my suggestion, (as he kindly did in 1860,) some photographs of these appearances. (1)

(1) The light part represents the sun, the dark projections upon its disc the portion of the moon showing the amount of eclipse at the times marked underneath (less 3 minutes).

The cut was executed by Mr. Delisle of Quebec.

He likewise exposed a collodion plate to the sun, moving it forward every five minutes, to show the effect of the sunlight on the sensitive surface. A like exposure of sensitive paper was made at the Observatory, with remarkably similar results. A piece of chromo-type paper was there also exposed in a similar way, and formed a complete photometer scale, showing the action of the sun light in the production of photographic effects.

On the Thursday previous, two large dark and prominent spots were observed on the sun, among others less conspicuous, but on the Saturday (the day of the Eclipse) only one of these was visible on N. W. aspect, and the progress of the moon across this spot was hid from view, owing to the passage of a somewhat dense *Cumulus* cloud, which obstructed distinct vision.

No distortion of the cusps was apparent. They appeared at all times sharp and well defined, and no flashes nor coruscations were seen on the moon, which presented the same apparently dark appearance and somewhat serrated edge throughout. The border of the moon before contact could not be observed by the small instruments employed.

Two polariscopes were used, one placed in a position due North and the other South. There was an absence of sky polarization in the one placed South during part of the time of the Eclipse, but that placed North showed the usual appearances. The change in the aspect of surrounding objects, and of the landscape generally, was very apparent, giving to the buildings (mostly of grey lime-stone) a peculiar lurid yellow hue, quite unlike the grey dawn of twilight. The leaves of the maple trees, close to the Observatory, were noticed to droop, and the petals of some flowers (the *Petunia Phœnicæa*) were observed to be partially closed. The effects, if any, on animals, domestic poultry, or birds, were not perceived. This may be owing to the late hour at which the obscuration occurred, being but a short time earlier than the usual hour of retirement.

No appreciable dew was observed on a prepared paper exposed for that purpose, although a very sensible increase of the moisture in the atmosphere was distinctly felt.

Ozone was much in excess. The ozonometer, placed at 4 P.M., and removed at 7 P.M., showed a tint corresponding to 3 of the scale, while the usual measure, exposed from 4 P.M. till 7 P.M., showed somewhat less than 2.

The observations of the sky spectrum, by the spectroscope, were carried out as well as was desirable. The only difference observable was a dulness in the colour of the red ray.

Peltier's Electrometer indicated but a very slight disturbance in the electric state of the atmosphere. The temperature of the air was observed every five minutes, as also the temperature of evaporation. The Barometer was read every fifteen minutes.

The intensity of the Sun's rays was also taken every fifteen minutes.

The wind was from the N. E., and veered occasionally to the W. For the most part it was calm. The clouds moved, during the whole time, from the N. E.

The weather, for some days previous, to the 7th, was, for the most part, cloudy, accompanied by showers of rain, with wind from the S. W., and moderate, varying from five to ten miles per hour. Rain fell on the fifth and sixth days.

The Barometer, at 7 A.M. on the fifth day, stood at 29.811 inches; it rose steadily until 7 A.M. on the morning of the eighth day, and then stood at 30.141 inches, at 2 P.M. of the seventh day it stood at 30.034 inches, and at 4 P.M. the reading was 30.010; from fifteen minutes after 4 until 7 P.M. there was a continuous fall; it reached, at that hour 29.900, and at 9 P.M. it again attained 30.110 inches. This fall of the Barometer accords with the observations made on the partial eclipse of 1860, at St. Martin's Observatory.

The temperature of the air, at 7 A.M. of the seventh day, was 53°9; at 2 P.M. 75°0, and at 9 P.M., 63°0. These were the usual tri-daily observations.

The Thermometer marked a constant and almost uniform depression (which was, in a slight manner, interrupted by the presence of clouds) from 5 P.M., when it stood at 70°0, and at 7 P.M., when it stood at 60°2, from which it rose to 63°0 at 9 P.M. The decrease in the intensity of the Sun's rays showed a like uniformity.

The greatest degree of humidity occurred at thirty minutes past 6, or about twenty-four seconds after the greatest obscuration; in like manner the increase of aqueous vapour, and the other hygrometric states of the atmosphere, culminated at or near that time.

The wind, during the night of the fifth day, and up to noon of the sixth, was from the N. by W.: mean velocity, 13 miles per hour. There were three hours of calm. From noon of the sixth day till noon of the seventh the wind was variable. It was due North, and calm, for forty-six minutes. It then veered by the West to W. N. W.

At 9.45 P.M. it was N.N.W., and, from 11 to 12, it attained a velocity of 10 miles: mean velocity 11.11 miles per hour. There was one hour calm from 12 noon to 1 P.M. At noon on the seventh day the wind veered to the N. by E., and from that time, to the N. W. and N. E. by N. From 3 to 4 P.M. it was W. by S., 18 miles. During the Eclipse it was variable, from N. E. to W. S. W.; and it continued in that point until 11 P.M. when it veered to N. by W. until daylight. It was calm from 12 to 1; from 1 to 2 also calm; from 2 to 3, 2 miles; from 3 to 4, 18 miles; from 4 to 5, 2 miles, and was calm during the rest of the night.

No furies or gusts of wind occurred during the eclipse, and no Aurora Borealis was seen.

Observations on the Magnetic Elements were attended to. The experiments on Vibration indicated nothing differing from the usual appearances. The vibrations did not seem at all affected by the Eclipse.

The Declination Magnet indicated a considerable variation in Eastern declination, and this continued increasing.

The Inclination magnet showed a very slight variation in the dip, but one of very small amount.

No stars were visible to the naked eye, and no telescopic search was made, although some of the first magnitude were well placed for observation, as were also some of the planets.

From the time of the Eclipse, and for the next succeeding eight days, the weather assumed a warm and genial character, in contrast to the unfavourable state of the previous month, and was a source of welcome and delight to the husbandman who so much required it to enable him to reap and secure a prolific harvest.

In reference to the observations of Mr. Balch, at Tadousac, the weather seems to have been very unfavourable. High wind, with rain and cloudy weather, impeded the view. The amount of Ozone would seem to have been somewhat in excess, and there was considerable variation in the Magnetic declination.

Mr. Ruskin on Art.

The Slade Professor of Fine Arts, Mr. John Ruskin, M. A., Christ Church, delivered his inaugural lecture in the Sheldonian Theatre, Oxford, on Thursday afternoon, 10th ult., when the capacious edifice was filled with as large an audience as was ever seen at an Oxford public lecture, a great many ladies being present, together with the Vice-Chancellor, in his official capacity, and many of the senior members of the University. The attendance of numbers of undergraduates testified to the universal interest that Mr. Ruskin's proposed lectures had excited.

Mr. Ruskin, who was much applauded, commenced by stating how conscious he was of the importance of the task he had in hand. These lectures were to commence a new era in University education; the study of fine art was now introduced in Oxford. The importance of that study he then explained. He said he looked forward to the time when, in the Universities and in our chief schools, this branch of education would cease to be neglected. He enlarged upon the beneficial effects of the study of art upon the character of a nation; he showed how true it was that art is the true exponent of the ethical condition of a people. The importance, then, that this study should be properly directed for this reason was evident; but there was another reason equally urgent. Each nation is peculiarly adapted to excel in certain schools of art, and if energy be exerted in a direction where excellence is unattainable, much power is necessarily wasted—much improvement is lost to the country. Now, in England it may be noticed that our artists never excel in that style which may be called theological and sublime; this was chiefly owing to a grossness in our nature, our greatest men having never regarded what was foul with the same abhorrence as did such men as Dante. Again, we fail in highly-finished decorative designs; our peculiar habit of mind necessitates this. We live in an atmosphere of too much care and anxiety to be able to give that entire devotion to the subject necessary to success. On the other hand, we show very great excellence in portrait-painting, in delineating home scenes, animal life, and landscapes. Now, in these branches of art ought our studies to be encouraged, and we ought to avoid as much as possible attempting to fancy we admire that which we feel to be above us, or, rather, out of our line. He intended, with the assistance of the authorities, arranging in the Taylor Gallery a collection of paintings or prints indexed, so as to show the chief points which are really beautiful in different styles of art. In his first course of lectures he would first examine three landscapes of Turner. He would then examine copies of animals, and point out the peculiar beauties inherent in the originals, as well as the necessity for accurate copying. He went so far as to express the hope that he might soon make some of our English youth prefer to

look at a bird to shooting it, prefer to make wild animals tame to making tame animals wild. He then pointed out the splendid future England may have, with her splendid legacies of glory spreading over a thousand years to call her to fresh exertions. She may direct the world; but, in order to do that aright, she must first direct herself. Let her in every way encourage all that will ennoble and raise the moral character. Let her, therefore, improve the taste for art. Let her educate her sons in everything that will make them men, and let those sons remember that England still expects every man to do his duty.

Mr. Ruskin left the rostrum amidst prolonged applause.

The special subjects of the several lectures of the talented professor will be:—Feb. 15, "The Relation of Art to Religion;" Feb. 22, "The Relation of Art to Morals;" March 1, "The Relation of Art to Use;" March 8, "Line;" March 15, "Light;" March 22, "Colour."—*Illustrated London News*.

OFFICIAL NOTICES.



Ministry of Public Instruction.

APPOINTMENTS.

MCGILL NORMAL SCHOOL.

The Lieutenant Governor, by an Order in Council dated February 5th 1870, was pleased to appoint William Henry Hicks, Esquire, Principal of the McGill Normal School, and Sampson Paul Robins, Esquire, Professor of Natural History and Agriculture in the same Institution, in the room of Dr. Dawson, resigned.

DIPLOMAS GRANTED BY BOARDS OF EXAMINERS.

KAMOURASKA BOARD.

Session of November 2nd, 1869.

ELEMENTARY SCHOOL DIPLOMA, (F.) 1st Class:—Misses Octavie Bérubé, Philomène Dancosse, and M. Catherine Richard.

2nd Class:—Misses Philomène Delisle, Léontine Marquis, Sara Martin, Elisabeth Michaud, and Démerise Plourde.

P. DUMAIS,
Secretary.

Session of February 1st, 1870.

ELEMENTARY SCHOOL DIPLOMA, (F.) 1st. Class:—Misses Sara Jane Blasdon, Victoria Mercier, Marie Zoé Plourde, and Elisabeth Poussard.

2nd Class:—Miss Georgina Beaulieu.

P. DUMAIS,
Secretary.

WATERLOO AND SWEETSBURGH (PROTESTANT) BOARD.

Session of February 1st, 1870.

ELEMENTARY SCHOOL DIPLOMA, (E.) 1st Class:—Messrs. Mervin D. Corey, Albert U. Hutchins, Edward Robinson, J. L. Walton and Miss Sophronia E. Johnston.

2nd Class:—Misses Almira E. Brown, Alice Ball, Margaret J. McElroy, Ruth J. Elkins, Sarah E. Kenison, Eurana B. Kenison, Alice Randall, and Mr. Nathan P. Lawrence.

W. GIBSON,
Secretary.

MONTREAL (PROTESTANT) BOARD.

Session of February 1st, 1870.

MODEL SCHOOL DIPLOMA, (E.) 1st Class:—Messrs Oliver Edward Barwick and Wm. G. Cruickshank.

2nd Class:—Miss Emma Kahler and Mrs. Eliza M. McDonald.

ELEMENTARY SCHOOL DIPLOMA, (E.) 1st Class:—Messrs Wm. Alexander Hawley, Allan D. McMillan and Miss Celina Jane Robinson.

2nd Class:—Mr. Célestin Gareau and Miss Laura A. Stevens.

T. A. GIBSON,
Secretary.

WATERLOO AND SWEETSBURGH (CATHOLIC) BOARD.

Session of August 3rd, 1869.

ELEMENTARY SCHOOL DIPLOMA, 1st Class:—Misses Mary Jane Barrett, (E. & F.); Elizabeth Rattigan, (E.); Marie Céline Tessier and Elphège Archambault, (F.).

2nd Class (F.):—Miss Mélanise Dubreuil.

J. F. LEONARD,
Secretary.

Session of November 2nd, 1869.

ELEMENTARY SCHOOL DIPLOMA, (E.) 1st Class:—Misses Catharine A. O'Brien, Mary Jane Failey and Mr. Elisha D. Burnham.

J. F. LEONARD,
Secretary.

Session of February 1st, 1870.

2nd Class (F.):—Miss Clémentine Senécal.

J. F. LEONARD,
Secretary.

THE JOURNAL OF EDUCATION.

QUEBEC, PROVINCE OF QUEBEC, MARCH, 1870.

Changes in the McGill Normal School, Montreal.

The Teachers, and especially the Protestant Teachers, of this Province, as well as all others who take an interest in its educational affairs, will feel concerned in reading the official notice contained in this number of the Journal. Dr. Dawson, who has been responsibly charged with the work of the McGill Normal School since its organization in 1857, has retired from the Principalship of that Institution. In this office he has been replaced by Professor Hicks, a coadjutor of Dr. Dawson from the first, and previously, during several years, an ardent and successful promoter of Normal School instruction and training. In another relation in which Dr. Dawson stood to the McGill Normal School—that of Professor of Natural History and Agriculture—he is succeeded by Professor Robins.

It may be safely asserted respecting the late Principal of the Institution, that no person in this country could have fulfilled the requirements of his important charge more creditably to himself or more usefully to the cause of education.

At the same time there is no known reason for doubting, but the contrary, that the new Principal Mr. Hicks, and his colleague Mr. Robins, whose ability as an instructor, and as a teacher of instructors, is recognized by all who are acquainted with him, will do ample justice to the interests of the McGill Normal School in the future.

When we reflect—referring here only to the schools required by the English speaking members of our community—how great was the dearth of qualified teachers before the McGill School was established it is satisfactory to know that, it has of late years been sending forth from 30 to 50 persons annually, competent to enter upon the duties of their high vocation. In fact, we have been assured by the statistics published, that from year to year each succeeding band of trained teachers excels rather than falls short of its predecessors, in regard to some of the preliminary qualifications, exclusive of actual experience.

While we contemplate the results, only so far as they have been alluded to above, claiming, in behalf of the Department of Public Instruction, as then constituted, some recognition on

account of the wisdom and enlightened forethought whereby the authorities of the Province were made to see the necessity for Normal Schools, and induced to do their part in founding them—recognising, also, the liberality of the Legislature, in appropriating considerable sums annually, for their maintenance—we have still cause for remembering, as most fortunate incidents in the history of the McGill Normal School, that it was found possible to obtain at first, and to retain during thirteen years, Dr. Dawson's valuable services in the carrying on of its work.

It is, moreover, a matter of no small moment, in an educational point of view, to find ourselves rescued from a deplorable, if not ignoble, dependence upon the former casual sources of supply of teachers. Even in regard to Normal School training, the remark just made applies to a certain extent. The agents indispensably necessary for making a beginning, were not to be procured in the Province (Lower Canada). They had to be sought after abroad, and imported, as far as the English Normal School was concerned, from England, Nova Scotia and Ontario.

For the schools, generally, it was impossible to procure properly qualified teachers. They, too, had to be looked up abroad, and, in the great majority of cases, especially as regards the country schools, the School Commissioners and Trustees were glad to engage these whose only, or chief inducement to enter the vocation, was, the lack of other employment. But, latterly, thanks to the McGill Normal School—thanks to the labors, the encouragement, and the services of the gentlemen of whom we now speak, the want alluded to has not been nearly so much felt.

We consider it, in some sense, a duty, while offering these observations respecting changes in the staff of that Institution, to again call the attention of our teachers, and particularly of those intending to devote themselves to the business of teaching, to the necessity of participating in the facilities and advantages which it offers. Not to cite other general claims, we shall here advert chiefly to those having reference to their own personal interests.

The process of displacement of the other professed teachers by such as possess the additional qualification of having pursued special courses of instruction, and training, in preparation for their business, goes on to the full extent of the supply furnished by the Normal School. Employers, such as School Trustees, as a rule, prefer teachers thus armed for their work. Wherever there is a vacancy of importance and value, the trained teacher, if one can be found, is invariably selected.

It is true that experience, without the preliminary qualification of special training, is not disregarded, particularly when, in the case of Superior Schools the applicants are College Graduates. But, to the professional teacher, a collegiate degree is really, now-a-days, of less marketable value than the Diploma of qualification granted after attendance upon the course of instruction and training in a Normal School. Lately, when the Protestant School Commissioners of the City of Montreal were selecting persons to fill posts in their institutions they were careful to seek those who combined with high attainments the advantage of which we now speak. Moreover, it was publicly admitted by them that the prospects of success in the work they have in hand were essentially dependent upon that of the Normal School furnishing the candidates for office.

In Ontario and the United States great efforts are being made to secure a regular supply of trained teachers to meet the entire demand. We notice, also, from an English Educational periodical, (*Papers for the Schoolmaster*) recently published, that the passed candidates for admission into Normal Schools in England numbered upwards of 1400 young persons at the Christmas examination of 1869. In short, young persons intending to render themselves eligible for the better class of situations as teachers, and to enter upon the vocation with fair prospects of success and future promotion in it, will surely find it in every way their interest to acquire Normal School advantages. Our country teachers should take note of this. All who are interested in the future success of young persons intending to teach should encourage and recommend them without fail to secure those advantages at all hazards.

Although much remains to be accomplished in the direction specified, and in regard to improvements in the remuneration and social position of our teachers, yet, in truth, much good has already been gained since the establishment of the McGill Normal School. As already referred to, and in connection with the changes that have taken place in its *personnel*, there is not only reason for being satisfied with its past work under the able management of Dr. Dawson, but every encouragement to anticipate an enlarged success under its new Principal and his colleague Professor Robins.

Opening of the Royal Western School, Montreal.

On the 11th ult., the Protestant Commissioners' School, St. Joseph's Suburbs, hereafter to be known as the Royal Western School, was opened under the patronage of His Royal Highness Prince Arthur. A description of the building has already been given, and need not be repeated; it will suffice to say that the rooms are large, airy and well lighted, conveniently arranged and comfortably furnished. The proceedings took place in the upper room, which was handsomely decorated with evergreens, tastefully arranged around the room. At one end of the room were the words, in brilliant letters "God Save the Queen," and at the other end "Welcome Prince Arthur to our School;" to the right, over the centre window, "Religion, Liberty and Science;" and to the left "Knowledge, Wisdom and Truth." At the end of the room opposite the platform, raised seats were provided for the children, and were all filled. The body of the room was allotted to the adult portion of the audience, which included many of the leading citizens with their wives and daughters. Precisely at half past ten, His Royal Highness drove up in an open sleigh, accompanied by Col. Elphinstone. He was received at the door by His Worship the Mayor and the School Commissioners, and conducted to the room in rear of the main room, where he shook hands with a number of gentlemen there waiting, and was thence conducted to the platform, the audience rising as he entered.

The Rev. Dr. Jenkins, Chairman of the Protestant Board of School Commissioners, presided, and with him on the platform there were His Royal Highness Prince Arthur, His Lordship the Metropolitan, The Right Reverend Bishop of Pennsylvania, Hon. James Ferrier, Senator; Col. Elphinstone, Rev. Canon Bancroft, D.D., School Commissioner; Rev. R. Irvine, D.D., Sir A. T. Galt, Rev. Canon Bond, Hon. P. J. O. Chauveau, Premier of Quebec and Minister of Public Instruction; Hon. J. Robertson, Treasurer of Quebec; Principal Dawson, Principal Graham of Richmond College, Rev. Dr. Taylor, Rev. Dr. Wilkes, His Honor Judge Mackay, His Honor Judge Day, His Worship the Mayor, Rev. Professor McVicar, Rev. Mr. Cordner, Mr. Lunn, School Commissioner; C. J. Brydges, Esq., M. P. Ryan, Esq., M.P.; A. M. Delisle, Esq., Catholic School Commissioner, Ald. Alexander, Ald. Rodden, Ald. Lyman, Rev. R. W. Campbell, Rev. W. M. Black, Rev. J. M. Gibson, Rev. A. Young, Rev. Thomas Gale, Dr. De Sola, Dr. Swallowood and others.

The proceedings began by the children singing a hymn, after which, His Lordship the Metropolitan offered up prayer.

Rev. Dr. Jenkins then read the following address of the Commissioners to His Royal Highness, the audience standing:

To His Royal Highness Prince Arthur Patrick William Albert, Knight of the Most Ancient and Most Noble Order of the Thistle, Knight of the Most Illustrious Order of St. Patrick, &c. &c., &c.

May it please your Royal Highness,—

We, the Protestant Board of School Commissioners for the City of Montreal, feel deeply grateful that your Royal Highness has been pleased to honour with your presence the opening of this school.

We beg leave to express to your Royal Highness the reverence and regard in which we hold the exalted virtues and beneficent rule of Her Most Gracious Majesty the Queen.

The duty devolved on this Board by the Government of the Province and the civil authorities, is that of providing for the Protestant children of Montreal, a sound and liberal education.

The Commissioners have been engaged in this work during a period of about twenty-three years.

Previously to the year 1868, owing to the smallness of the public grant for education, the Commissioners were able to provide for the Protestant community of Montreal, only three schools, and even these were of a comparatively inferior order.

Recent legislation has enabled the Board to increase the efficiency of the schools then in operation, to add this establishment to their number, to plan a yet wider extension of the work of education, and, at the same time, to reduce the school-fees to a merely nominal charge.

The Commissioners have also made arrangements by which the sons of the humblest citizens may, by competition, be advanced from the common schools, as free scholars to the High School of Montreal and to the McGill University.

We cordially welcome your Royal Highness to our new school house, built in furtherance of this important work,—a work in the success of which, we are sure, your Royal Highness takes deep interest.

Signed, on behalf and by authority of the Board, on this 11th day of February, eighteen hundred and seventy.

(Signed,)

JOHN JENKINS, D.D.,
Chairman.

WM. LUNN, Secretary.

A deputation of children from the several Protestant schools of the city then came forward to present an address to His Royal Highness. The following are their names:—From the Royal Western School, Master George Lochart Lamb and Miss Louisa Walmsley; from the British Canadian School, Cote street, Master George Bradshaw and Miss Sarah Oppenheimer; from the Panet street School, Master Edward Heath and Miss Sarah Ferguson; and from the St. Ann street School, Master William Scott and Miss Amanda Woods. Master George L. Lamb was the one selected to read the address on behalf of the others, which he did in a very creditable style. It is as follows:

To His Royal Highness Prince Arthur,

Your being present at the opening of our new School is, we know, a very great honour, while it adds to the joy we feel when we think that we are to go on with our studies in so fine a building. Here we hope to learn and gain that which alone can make us faithful children of God, good subjects of our gracious Queen and true lovers of our country.

We shall ever look back upon this day with pride, not only because this school has been built for the good of us children, but also because we have been favoured with your royal countenance.

His Royal Highness bowed gracefully on receiving this Address, and then proceeded to read the following reply:

Most sincerely do I return my thanks to you, Mr. Chairman, and to the Commissioners, as well as to the children of this School, for the gratifying addresses that have just been presented, and for the hearty welcome that has been accorded to me. You are right in believing that I take a deep interest in the success of so useful an establishment as that which we are now here to open. I assure you I regard the spread of general education, combined with religious teaching, of the most vital importance, not only to each individual person, but likewise to the progress, the welfare and the safety of a country. The efforts which you have been making in behalf of a sound and liberal education, accessible to the poorest classes, are most praiseworthy, and sincerely do I hope, that through God's blessing, your labors may be crowned with the utmost success, and that the many children here taught may in after years look back upon the days they have spent here with deep gratitude to the Almighty for the benefits they have derived.

ARTHUR.

After the cheering which followed the reading of this Address had subsided,

Rev. Dr. Jenkins rose and said: May it please your Royal Highness, My Lord, Ladies and Gentlemen,—To the Protestant School Commissioners of Montreal this is indeed a high day. Not alone because we are favored with the Royal presence, but also because we have before us evidence that education is making some little progress amongst the Protestants of Montreal. No work of greater moment to the city and its interests can devolve on any number of men than that of securing for the middle and lower classes a sound and liberal education. When I say a sound education, let me observe, that in our judgment, as Commissioners, no education can be sound but that which is based upon the Word of God. And no education, moreover, can be liberal but that which is based upon a Book of the highest antiquity, of the largest comprehensiveness as to morals, as to our duty to each other and our duty to the Supreme Being. Public school education was initiated in Montreal by a few British and Canadian gentlemen, who founded the British and Canadian School, in 1822. The school now in operation was built in 1827, nearly half a century ago. This school was supported by French-Canadians and British alike. The representative of His Majesty King George the Fourth, the Earl of Dalhousie, then Governor General, was the first patron of the British-Canadian School. He was not a mere nominal patron, but a real patron of that institution—evinced a lively interest in the school, visiting it from time to time, and recording his satisfaction with its character. And, besides that, he educated and clothed at his own expense 40 French-Canadian children. Our Roman Catholic fellow-citizens had no public school at that time in the city of Montreal, and, like good citizens and good neighbors, they met together in the British and Canadian School. In this school, I may add, many of our professional men and successful merchants, received what education they ever had the privilege to receive. The establishment of the British and Canadian School gave an impulse to common school education which is felt to this day. In 1846 the Government of Canada passed the act under which the Protestant Board of School Commissioners was appointed for Montreal, and at the same time the Roman Catholic Board of School Commissioners was appointed. The money at the disposal of the Board, derived from two sources—the public funds and the city funds—was at that time \$1,116. In 1852 it was reduced to \$1000. During that year, however, by dint of economy, the Board saved money enough from their income to enable them to purchase, in 1853, the school house in St. Ann street. In 1860, the Panet street school house in Quebec Suburbs was erected at a cost of \$5,000. Down to 1863 the income of the Board was from \$1,200 to \$1,400 a year; from 1864 to 1868 \$2,100; in 1868 under a special act, about \$9,000; and as the result of the legislation of 1869, the annual income is, as nearly as we can arrive at it at present about \$19,000. From this statement it must be clear to every one that for years the Board was crippled in its efforts to overtake the educational wants of the Protestant population of the City. With varying success we gave an education to a comparatively large number of children, but it was an elementary education—very elementary. As soon as the Board had a prospect of an income more adequate to its wants it resolved upon two or three things. First, to enlarge the buildings as much as possible. This was done in Panet and Cote streets, for the British and Canadian School, I ought to have said, in 1867 was placed under the charge of the Protestant School Commissioners. We resolved also, not only to increase the size of the buildings but, what we felt to be more important, to raise the standard of Education in the Schools. This of course involved the employment of teachers of a high class. I may say here that the Commissioners have felt all along that the progress of their work for the last two or three years is due in a great measure to the existence of the Normal College; and they are indebted for the existence of that college to my honorable friend, Mr. Chauveau, the Minister of Public Instruction, who has taken a very great interest in the establishment of such institutions. I say the Commissioners have felt all along that it would be impossible to man our schools with teachers of a sufficiently high class but for the Normal College, which is sending out so many thoroughly accomplished men and women for the schools. We have established in each of these schools what we call an advanced class—it may be designated a grammar school class—in which are taught the elements of geometry and algebra and the elements of the Latin tongue, our object being to send up by competition from these common schools to the High School of Montreal the cleverest—the best class, intellectually and morally,—that is the best way to put it,—of the children of the middle and lower classes. We wish that these children should have the same opportunity, by the gifts which God has given

them, to rise to the very topmost round of the ladder of success in this world. With that view the Commissioners have lately taken under their charge the High School of Montreal. A very onerous work will devolve upon the Commissioners in connection with that school. It is our purpose to remodel it, to make it at once a school for a higher classical education, and a school also for a thorough commercial education; while, at the same time, we hope to be able to reduce the fees. I am sure this statement will be gratifying to my friends around me who are engaged in mercantile pursuits in this city. We have felt all along that there has been a need in this the greatest commercial city of the Dominion of a thoroughly equipped commercial school. There is one object which we desire to accomplish in connection with the work of education in the city of Montreal, and that is the establishment of a Girls' High School, so that the daughters of our humbler citizens may, at a comparatively small charge, obtain the advantages of a thorough education—such an education as our Normal School teachers receive; and so also that by competition girls may go up from this school and other schools like it—from the common schools—free of charge into this high school for girls. The Commissioners feel that this is a work which must not be lost sight of. But it is a work which they shrink from undertaking unless the wealthy citizens of Montreal, are prepared to provide for the Commissioners, free of charge, a building for this purpose. Such a building would cost perhaps about \$15,000. With \$15,000 we could establish—for it would be a self-sustaining institution—a High School for Girls, so that the daughters as well as the sons of the humblest classes may rise to distinction in learning and prepare themselves the better for the world.

I wish to say a word in regard to the religious character of these schools. I am not unmindful that the Board, of which I have the honor to be Chairman, is a Protestant Board, and I need not say to my friend on my right (Hon. Mr. Chauveau), and others friends belonging to the religious majority, whom we are glad to see with us, that while we are ready to manifest and to exercise the completest toleration to them, and to live in unity and concord and peace with our Roman Catholic fellow subjects, yet we feel that we have principles to maintain in our Protestant schools. The Bible is honored in our schools; it is read and studied; its history, its geography, its principles, moral and religious, are, as far as we have been able to overtake that important work, faithfully taught to the children. And I would be very glad, and so would my brother Commissioners, if the clergy of the city, whom we are delighted to welcome here to-day, would occasionally pay a visit to the schools, and examine for themselves into the character of the religious training which is given. It would be, I am sure, satisfactory to his Lordship, the Metropolitan, and to the other clergy of the city if they would go, and I would be happy to go with them at any time to examine these schools in regard to the character of the religious instruction which is imparted. We believe, as Commissioners, that the Bible must be retained in our Protestant Common Schools. That is our view, and that we intend to maintain at all risks and hazards. For I believe in the admirable words which His Royal Highness has just read to us, that we must have all classes of our people educated upon the basis of our common bible. We find no fault with our Roman Catholic friends, but we maintain our principles.

I fear that I have already exceeded the limits which I should have allotted to myself; but I feel that, perhaps, the Commissioners will never have such an opportunity again of explaining to the citizens of Montreal what they are doing and what they hope to do. I will say before I sit down that it is a very great gratification to me and to my brother Commissioners to find ourselves surrounded by so large a number of wealthy fellow-citizens, by so large a number of the clergy of the city, by the Metropolitan, who has lately come amongst us, and whom may God bless and preserve in his great work. And it is gratifying to find on my left my old friend, the Right Reverend Bishop Stevens of Pennsylvania. Glad am I to meet him to-day. And it is a special pleasure—a pleasure which I cannot find words to describe—that we should be honoured to-day with the presence of a son of our Most Gracious Queen, whom may God long preserve to rule over an unbroken and united empire—and the son of that great and good prince, who, perhaps, more than any other prince in the history of Great Britain, did more to elevate the middle and lower classes of the people of Great Britain. One word more—I intend to let out a secret. At the next meeting of the Board I intend to propose that this school shall be remembered by this day, and that we shall call it—I trust His Royal Highness will grant us this permission—"The Royal Western School."

Hon. Mr. Chauveau was then introduced by the Chairman, and was received with cheers. He said: Your Royal Highness, Mr. Chairman, Ladies and Gentlemen,—I am most happy to be present

on this auspicious occasion. I have felt for a long time in common with my friend the Chairman, and with both the Catholic and Protestant Board of School Commissioners, the insufficiency of the means provided by the city of Montreal for the education of the children. The new law has placed, as you have heard, a very large sum of money at the disposal of both the Boards of School Commissioners; and has made it so that the taxes of Catholics go to Catholic schools, and those of Protestants to Protestant schools, while the sum given by the Government is divided according to population. This gives a larger relative proportion to the Protestant schools. I see with pleasure that these gentlemen as well as their *confrères* of my own religion, have promptly improved the occasion, and set to work building school houses and providing for the education of a larger number of children. We all feel that under our form of Government, with the difficulties to which this country is subject on account of its climate, geographical position and political position also, the education of the people is our greatest need and our first duty. Therefore, we ought to feel grateful to those who are entrusted with this great work, when they do their duty. It may be said they only do their duty, and are not entitled to special thanks for that, but there are two ways of doing one's duty. One is doing it *ad justum*; the other is doing it with a zeal and energy, and with a steady determination to be successful; and that is the way in which these gentlemen have done their duty. It is certainly gratifying to see in so short a time this fine building erected and this school in operation, under the law passed not quite a year ago. Your Royal Highness has not given to-day for the first time, evidence of the interest you feel in the education of the people of these Provinces. You had hardly entered the good old city of Quebec when your Royal Highness was engaged in visiting the educational institutions of various grades. I remember quite well, after a regular course of visits to these institutions, another institution, an elementary school, applied for a visit. I felt for my part that the task had been pretty well fulfilled, and I thought it hardly fair that your Royal Highness should be taken to another school. But I remember your Royal Highness insisted upon visiting that school, because it was an elementary school, one of that humble class of schools which are at the foundation of the whole system of public instruction. And this meeting knows full well that this has been the conduct not only of Prince Arthur but of his brother, the Prince of Wales, during his stay in Canada. And I may say, for I have been recently hunting up some old newspapers, that it was the course pursued by His Royal Highness' grand father, Prince Edward. When in Canada he visited schools, and gave a most liberal patronage to education in every way.

Now, Mr. Chairman, I shall conclude by expressing my most earnest wish for the success of your undertaking. Of course, connected as I am with you in the most important of my duties, those connected with public instruction, it is but natural that I should wish every success to an undertaking of this kind. You have said, Mr. Chairman, a few words on which I might comment, but I will abstain from it. As to the religious position of our schools, there is one satisfactory feature, and that is, that we have most heartily agreed to disagree. We have found out—whatever may be said elsewhere, or tried elsewhere, I don't care—we have found out that the best mode of giving a sound religious education, is to give it by not excluding the religious views of the parents from the schools of the children. We found out and carried into practice, as far as regards the two great divisions of this country—Catholics and Protestants—that there should be sectarian schools. The law admits of mixed schools, and if any community are so inclined, or are so situated that they are under the necessity of having a mixed school, they are welcome to have it. But whenever either party chooses to separate they are allowed to separate and carry into the school the religious views of the parents of the children. Of course you have full scope as well as the other portion of the population. But I hope and trust that while the religious views of each section are taught, at the same time nothing shall be taught that would create animosity or generate bad feeling between the two sections of the people in this Province and that mutual friendship, mutual toleration, a common love for our common country, and a common attachment to our institutions and our Queen shall be taught in all classes of schools in the Province of Quebec.

The Metropolitan then closed the meeting by pronouncing the benediction.—*Daily News*.

McGill University.

EXTRACT FROM THE ANNUAL REPORT OF THE CORPORATION OF M'GILL UNIVERSITY TO HIS EXCELLENCY THE GOVERNOR-GENERAL, AS VISITOR OF THE UNIVERSITY—JANUARY, 1870

Printed by Permission of His Excellency.

In presenting our customary Annual Report we begin as usual with the statistics of the present session.

The number of students in McGill College is as follows:—

In the Faculty of Law.....	31
“ “ Medicine.....	135
“ “ Arts.....	71
	<hr/>
	237
Or deducting four students entered in two Faculties.....	4
	<hr/>
	233

The students in Affiliated Colleges are:

In Morrin College, Quebec.....	14
In St. Francis College, Richmond.....	12
The Teachers-in-training in the McGill Normal School are.....	76
The Pupils in the High School Department are.....	175
The pupils in the Model School of McGill Normal School are.....	335

The total number of persons thus deriving benefit from the University as students and teachers-in-training is 335, and as pupils in school 510 in all 845. Of the former more than 200 are persons not resident in Montreal, resorting thither for education from various parts of Canada and from places beyond its limits, and about 120 are persons whose families reside beyond the limits of the Province of Quebec.

The number of students in the Faculties of Law and Medicine is somewhat less than that reported last session. This is probably in part due to recent medical legislation in Ontario, rendering it more difficult for students from that Province to avail themselves of the advantages presented in this city; and in part to the fact that one of the universities of Ontario has assumed the power of affiliating schools of law and medicine in this Province.

At the annual meeting of the Convocation in May last, the degrees publicly conferred were as follow:—

Doctors of Medicine.....	40
Masters of Arts.....	5
Bachelors of Civil Law.....	16
Bachelors of Art.....	13
	<hr/>
Total.....	74

At the close of the session of the McGill Normal School, the following diplomas were granted to teachers-in-training by the Minister of Public Instruction:—

For Academies.....	3
“ Model Schools.....	17
“ Elementary Schools.....	28
	<hr/>
Total.....	48

Under the regulations for examinations of schools the school certificate of the University was granted to ten pupils of the High School of McGill College.

We have much pleasure in stating that a scholarship of the value of about \$120 per annum has been established in the Faculty of Arts by subscription of the members of the Board of Governors, and that T. M. Thomson, Esq., of this city, has presented to the University a sum of \$250 to be given in five prizes in the Faculty of Arts, with the view of aiding deserving students. We have also received from R. A. Ramsay, Esq., M. A., one of our graduates, a donation of \$100 as a commencement of a graduates' scholarship; and another graduate, Rev. Colin C. Stewart, B. A., has offered an annual sum of \$20 as a prize in Hebrew.

The Library has received in the past year a donation of 221 volumes in classical literature from Charles Alexander, Esq.; an additional donation of 207 volumes in history from P. Redpath, Esq.; and 104 volumes of Public Records and works relating to Canadian History from R. A. Ramsay, Esq., and 134 volumes of miscellaneous works from Mr. Macmillan of London, besides many minor donations. A society of gentlemen has also been formed in the city, under the name of the McGill College Book Club, by which additions will be made to the Library on conditions which will make it at once more valuable and more accessible to the public.

In the report of last year, it was stated that the subject of technical education had engaged the attention of the corporation, and that a

committee had been appointed for the purpose of urging upon the Government the expediency of establishing schools of mining, metallurgy and engineering, in connection with the University, and for collecting information and preparing plans for such schools. On the subject of mining more especially, our views were communicated to the Director of the Geological Survey for the information of the Dominion Government; and the assistance of the University was offered in regard to lectures, class rooms, apparatus, museum, examinations and diplomas, in event of such a school being established in Montreal. The great economy which could be secured in this way, as well as the greater prospect of success in the undertaking, we believe should weigh much with the Government in favour of the immediate establishment of such a school; than which we are confident nothing could more contribute to the development and prosperity of mining enterprise in the Dominion. In the meantime the University continues to give, as far as its means permit, such training in practical geology and allied subjects, as may fit students for entering technical schools of mining here and elsewhere.

The Education Bill, passed last winter by the Legislature of Quebec, having apparently terminated all hope of an increased public provision for the higher education in this Province, and the revenues of the University derived from its private endowments, being barely sufficient for its ordinary expenditure, without permitting any of that growth and extension which are so desirable, it has been decided by the Board of Governors again to appeal to the citizens of Montreal, and to endeavour to obtain an additional subscription sufficient to enable the College to retain the remainder of Mr. McGill's estate for College purposes. It is intended to solicit this subscription more especially as an aid to the general funds of the University, or for the endowment of existing chairs, or for scholarships and exhibitions, without excluding any special benefactions for other purposes which may be offered by the friends of education. It is estimated that a capital sum of \$150,000 would satisfy all the immediate requirements of the University and enable it to extend and improve its operations in many very important respects.

The University has for many years carried on the High School of the city of Montreal, without any extraneous aid except the fees of the pupils and a grant from the Government in aid of the education of 30 free scholars. Since, however, the recent education act has established a more complete system of schools for the city, and has placed in the hands of the Commissioners the means to sustain the High School more efficiently, it has appeared to be the duty of the University to offer to transfer this part of its work to the Protestant Commissioners of Schools. It is believed that this will be effected on equitable terms and with benefit both to the city and the College.

(Signed,) CHS. D. DAY,
Chancellor.

Books and Exchanges Received.

Annual Report of the Board of Regents of the SMITHSONIAN INSTITUTION, showing the operations, expenditures, and condition of the Institution for the year, 1868.

We are indebted to Alexander Gordon, Esq., Toronto, Law Printer to the Queen's Most Excellent Majesty, for a copy of the *Statutes of the Province of Ontario*, passed in the Session held in the thirty-third year of the reign of Her Majesty Queen Victoria, being the third Session of the first Parliament of Ontario.

Annual Report of the Normal, Model, Grammar and Common Schools in Ontario, for the year 1868, with Appendices, by the Chief Superintendent of Education.

We have to thank the Hon. S. S. Ashley Superintendent of Public Instruction of North Carolina, for a copy of his *Report for the year, 1869.*

The Irish Teachers' Journal and Assistant, Dublin, March, 1870.

The American Educational Monthly, March, 1870.

New Dominion Monthly, April, 1870.

The American Educational Monthly, April, 1870.

Appletons' Journal of Literature, Science and Art, April 2, 1870.

The Nursery, a Monthly Magazine for youngest Readers, March, 1870. There are thirty illustrations in this number. Is that not enough (without the letter press) for the twelfth part of \$1.50?

The Maine Journal of Education, March, 1870.

The National Normal, March, 1870.

The Mount Auburn Index, February, 1870.

The Orthopathic Journal and Messenger of Health, Vol. 1.—No. 1., January, 1870, J. Stolz, M. D., Editor and Proprietor, Dayton, O. \$1.00 per annum.

Arkansas Journal of Education, February, 1870.

Journal of Education, St. Louis, February, 1870.

Hearth and Home, April 2nd, 1870.

The Massachusetts Teacher, March, 1870.

The Weekly Spirit of the Times and Northampton Educator, March, 19, 1870.

Howe's Musical Monthly, (No. 8) contains 11 instrumental pieces and 10 songs piano accompaniment. Each number contains \$6 worth of first-class piano music for thirty five cents or \$3.00 per year. Address, Elias Howe, 103, Court St., Boston.

The Rhode Island Schoolmaster, March, 1870.

Kansas Educational Journal, February, 1870.

The Organization of High Schools.—An Address before the sub-committee of the Boston High School Board, appointed to consider the subject of a reorganization of the Boston High Schools,—by W. P. ATKINSON, Professor of English Literature in the Massachusetts Institute of Technology,—Boston: Crosby and Damsell, Publishers.

The Illinois Teacher, March, 1870.

The Manufacturer and Builder, March, 1870. An excellent number.

Whitney's Musical Guest, March, 1870.

Both the reading and music are well selected and suitable to the musical public. Each number contains no less than three songs; or two songs and one instrumental piece, such as is sold in sheet form for 30, 40, and 50 cents each, and all this sent monthly for the low price of \$1.00 per annum. Address "Whitney's Palace of Music," Toledo, O.

Good Health, Vol. 1, Nos. 8, 9, 10 are received. This is a really good work, written in a style that everybody can understand, and should be read in every family as it contains a great deal of useful information on "Physical and Mental culture." It is published by Alexander Moore, 11 Bromfield street, Boston, Mass., at \$2 per annum, Am. Cy.

Fifth Annual Catalogue of the Officers and Students and programme of the course of instruction to the Massachusetts Institute of Technology, 1869-70.—Boston: Press of A. A. Kingman.

The California Teacher, March, 1870.

Ohio Educational Monthly, March, 1870.

The Technologist, Vol. 1. No. 1. February, 1870.—This is the title of a new Industrial Journal, devoted to Engineering, Manufacturing, and Building, the distinguishing feature of which is the fact that all the Articles and Illustrations are original—no clippings or old engravings being used. The Publishers further pledge themselves that no advertising articles (that is, no descriptive puffs of worthless inventions) shall be inserted in its columns under any circumstances whatever; and, if they fulfil this pledge, they will certainly render a service to industrial journalism, for every intelligent mechanic knows that indiscriminate puffing is the bane of mechanical and so-called scientific periodicals.

The number before us consists of forty-four large pages, (thirty of which are devoted to the *specialty* of the journal) printed on very superior paper, and in the best style of the typographic art. The articles, too, are excellent, and contain matter calculated to instruct and interest all classes. The titles of a few of the subjects discussed are,—Technological Education, Tempering Steel, Trial of Steam Engines, Improvement in Distillation, Sunless and Airless Dwellings, the Measurement of Electrical Resistance, Vision and the Stereoscope, the Walks of New York Central Park, East River Bridge Caissons, the Microscope, Lessons on Drawing, Relation of Technology to Insurance, etc., etc. The yearly subscription is Two Dollars and the price of single numbers Twenty Cents, a sum that seems very small when compared with the size and character of the Journal. It will require an enormous circulation to make the enterprise pay at these figures, and it is pleasant to see that the Publishers have faith in the undertaking.

The *Technologist* is issued by the Industrial Publication Company, whose office is at 176 Broadway, New-York. If every mechanic sends for the first number of this Journal, he will be sure to send for the others.

BLUE BOOKS.

General Report of the Minister of Public Works, Canada, for the year ending 30th June, 1869.

Tables of the Trade and Navigation of the Dominion of Canada, for the fiscal year ending 30th June, 1869.

Report of the Postmaster General for the Dominion of Canada, for the year ending 30th June, 1868.

Public Accounts of the Dominion of Canada for the fiscal year ended 30th June, 1869.

Statement made by Insurance Companies.

Emigration to Canada, 1870. The Province of Ontario; its soil, climate, Resources, Institutions, Free Grant Lands, &c., for the information of intending of Emigrants. Issued by authority the Government of Ontario, 1869.

MISCELLANY.

Education.

—*Brains and Muscle*.—W. S. Clark, Esq., President of the Massachusetts Agricultural College, in his recent report offers the following remarks: "Some persons appear to look upon the contented performance of coarse and difficult manual labor with a sort of respect, and to regard with suspicion any attempt to avoid or relieve

it, as indicative of laziness. But a desire for improvement lies at the foundation of all progress in the arts, and by the intelligent efforts of men dissatisfied with the methods of the past, agriculture is rapidly rising toward the dignity and physical comfort of a learned profession. How much more mind and how much less muscle is now called into requisition in the various operations of husbandry than twenty-five years ago. In preparing the soil, in planting, in cultivating, in haying, in harvesting, in threshing, in the management of the dairy; in fact, almost everywhere, intelligence is the principal thing, and mere brute force comparatively worthless. The old prejudice against thoughtful, studious and progressive men, as book farmers and fancy farmers, has at length been overcome by the mass of printed matter which pours its light into every household, and by the numberless improvements which have been demonstrated to be not merely expensive luxuries for the rich, but of priceless value to every tiller of the soil."

—*The University of California*.—It is certainly a bold and novel step that has been taken by the Board of Regents of the State University of California—a step which places it in advance even of Cornell University in some respects. In announcing that all fees will be abolished, and that the new institution will be free to all properly qualified applicants from all countries, its managers have taken advantage of the munificent endowments of the University to establish it on a basis that must secure its place as the leading institution of learning on the Pacific Coast. In the way of endowment, this University has not only obtained the valuable Congressional land grant, but is directly under State patronage, and still farther, has received several very large gifts and bequests from wealthy citizens of California. Its property and income are sufficiently large to furnish it ample means for the payment of all its expenses, including the salaries of its professors and officers, which have been fixed at figures sufficiently large to attract some of the ablest scholars from this city and other parts of the country. In fact, both as regards its faculty and its revenues, the new University must take a prominent place among American institutions of learning, and we have no doubt that the liberal programme it has now adopted will secure it an abundance of students. California is in the habit of doing things that astonish the other parts of the country, but it never astonished us more pleasantly than it has now done in opening freely the doors of its State University to the young men of all countries who are desirous of the higher learning. Let it include the young women, and we shall ask for nothing more.—*N. Y. Tribune*.

Literature.

—Mr. George Hogarth, long associated with this journal, (*The Illustrated London News*) as musical critic, and for twenty years with the *Daily News* in the same capacity, died on the 12th ultimo, in his eighty-seventh year.

Originally following the profession of writer to the Signet at Edinburg, and mixing much with the illustrious literary men assembled then during the first quarter of this century (especially with Sir Walter Scott), Mr. Hogarth came to London about 1830, and was engaged on the *Morning Chronicle* as a writer on politics, music, and the drama.

He was also the author of "Memoirs of the Opera," and "Musical Biography and Criticism," works which are quoted by English and foreign writers on the subjects of which they treat; besides having contributed articles to magazines and other periodicals. The *Household Narrative*, which was published in connection with *Household Words*, founded by his son-in-law, Mr. Charles Dickens, was compiled by Mr. Hogarth, who edited various works, both musical and literary. Among other occupations of his long and active life was his fulfilment for fourteen years, of the office of Secretary to the Philharmonic Society. He married a daughter of Mr. George Thomson, of Edinburgh, whose name is perpetuated in the biography of Beethoven, and the history of his works, by the commissions given to the composer for many arrangements of national airs, chiefly Scotch, with accompaniments. With extensive literary acquirements, active intellectual faculties, and large sympathies, Mr. Hogarth combined a guileless simplicity of character and never-failing geniality of temper that endeared him to all who knew him; and to none more than the writer of these lines, who has succeeded him in his office on this journal, and who was for many years his colleague elsewhere.

Public Opinion says that Mr. Charles Wells, the eminent Oriental scholar, has at length had his ability recognized in the most graceful, as well as munificent, manner by the Turkish Government, by appointing him to the post of Professor of English in the Imperial Naval College at Constantinople.

—*Hebrew Literature.*—The *Athenæum* says "It has been proposed to form a "Society for promoting the knowledge of Hebrew Literature," which will undertake to publish translations, with or without original texts, either of entire works or of abstracts and selections from them, according to the nature of their contents. A further object is the organization of lectures, courses for exposition of important Hebrew works, and periodical meetings. The subscription will be one guinea annually. Important names have been already enrolled, and the Provisional Committee will shortly publish a detailed prospectus. It is to be hoped that the gentlemen originating this desirable project will succeed in their laudable scheme. Both Christians and Jews may unite in it, especially as the literature intended to be brought before the English public will be post-Biblical."

—The London correspondent of the *American Publisher and Bookseller*, writing about the inordinate multiplication of cheap magazines, and speaking apparently the opinions of Paternoster-row, whence he dates, gives some statements that will unsettle many preconceived beliefs. Many, he says, it is certain do not pay directly, but it is considered the correct thing for publishers of any importance to have their own magazine, which serves as a good advertising medium. "Take, for instance," he continues, the *Cornhill*, which but lately had a circulation of over 80,000, and is now generally supposed to be 85,000, but in "The Row" it is spoken of as not selling over 18,000 copies; *Macmillan*, supposed circulation 18,000, we in "The Row" say about 7,500; *Belgravia*, edited by Miss Braddon, began with over 36,000, in "The Row" we put it down at 18,500; *London Society* is increasing and sells over 20,000; *Temple Bar*, supposed circulation 20,000, we in "The Row" say not over 13,000; *Blackwood's Magazine* sells about 7,500; *Saint Pauls*, edited by Anthony Trollope, our latest, and most promising in contents, began with 50,000, but does not now sell more than half that number; *Tinsley's Magazine* containing a story by Dr. Russell, of the *Times*, does not sell 10,000 per month," and so on.

Science.

—*Comets.*—It is needless to dwell here upon the numerous varieties and peculiarities in the lengths and positions of the tails of different comets; it will suffice to say, that in a general way the telescopic aspect is that of a quantity of vapour escaping from the nucleus towards the sun, and then carried directly behind the comet, as if by a repulsive force emanating from the sun, sometimes for a distance of myriads of leagues, thus forming the tail. Hence, in whatever direction the comet is moving, the tail is turned away from him, the furthest end being curved backwards, just as a flexible rod or feather would be if whirled rapidly round one extremity. Now, the great difficulty lies in conceiving the possible continuation of a body which can deport itself in the way we have been describing. We should imagine that it must sweep away planets in its wild gyrations. We hardly regard it as ridiculous that Whiston should have gravely maintained that it was by a whisk of one of these tails that the deluge was brought about, and calculated the particular comet which caused that catastrophe. However, everything goes to prove that these comets are huge impostors—head and tail alike—and are the most vapoury, windy bodies conceivable; so much so, that it is no exaggeration to say that the tail, with all its millions and billions of miles, might, if properly packed up and stowed away, travel by a continental passenger-train, and cost nothing in the way of extra luggage. This has been long known; and Sir John Herschel sees no difficulty in conceiving that the tail of a great comet, as, for instance, that of 1680, with its twenty millions of leagues, might weigh only a few pounds, or even ounces. This tenuity of constitution is proved in many ways: partly by the disturbances and deviations caused in a comet's motion by the approach to any other body; and partly again, by the fact that stars have been seen to shine with undiminished lustre, alike through their heads and tails—stars which would be utterly obscured by a few feet of ordinary terrestrial mist. But, granting any amount of tenuity, it is hard to conceive such an extended mass whirled half round in two hours, and retaining its continuity. Sir John Herschel, therefore, ventured upon a conception involving the total absence of matter altogether—suggesting the hypothesis of a negative shadow; and an original thinker, speculating upon the last big comet of 1858, announced the discovery in the papers that comets were worlds on fire, most probably suffering the punishment of their wickedness; and that the light proceeding from the conflagration was invisible where the sun's rays penetrated, but was seen in the shadow cast by the head, thus producing the tail—an idea involving, among other absurdities, the necessity of all the planets appearing with black tails behind them.—*Chambers' Journal*.

—*The Liver and its Diseases.*—The liver is subject to several diseases in common with other parts of the body, as for instance, inflammation, cancer, and abscess, but the results are modified by the peculiar structure of the organ. It is subject also to particular affections which are due to the operation of special causes. There are two things which happen in most such affections—either the organ enlarges, sometimes to an enormous degree beyond its proper size, or it contracts below it. No cause is so productive of chronic enlargement of the liver as heat. The hot climate of India is so frequent a cause of this disorder, that to come home with a big liver and a heavy purse was a current joke in the palmy days of money-making in that country. By the slow influence of climate the organ becomes engorged with blood and its functions sluggishly performed. The result is seen in the muddy or even lemon tint of skin so characteristic of Indian residents, which is due to the imperfect elimination of the bile from the system. There is a certain preparation of liver (*pâte de foie gras*) well known to epicures. But it may not be equally well known that this delicacy is really the product of disease. At Strasbourg, where it is chiefly made, the geese from which the livers are obtained are subjected to the prolonged action of heat. It is alleged, on good authority, that these unhappy birds are nailed by the feet to boards, so as to insure the proper amount of exposure during this inhuman process. But if the pleasures of the palate are the means of so much heedless suffering to unoffending creatures, they are not altogether unavenged. It is evident that diseased livers are far from being wholesome food. The small or contracted liver is usually the result of intemperance. The surface of the liver is covered by a stout membrane, called its capsule, and from this certain fine bands, or *septa*, pass through it between the lobules, so as to preserve the form and consistency of the organ. The effect of alcohol, absorbed from the stomach, upon these fine membranes is to induce in them a slowly-acting inflammation, by which contraction is induced. It results from this that the secreting cells of the liver are compressed and spoiled, and its surface, instead of being smooth and regular, becomes elevated into nodules, not inaptly compared to "hob nails" in appearance. This is also well known to anatomists as the "gin-drinker's liver." In order to make it clear how it is that spirit-drinking is so injurious to the liver, it will be well to explain here the peculiarity of the circulation through the liver. Instead of being supplied with arterial blood, like other parts of the body, the blood which goes to the liver is collected from certain abdominal viscera, namely, the stomach, the intestines, and the spleen, into a large trunk, called the portal vein, by which it is conveyed to the liver, and then disseminated through it by means of the small vessels already spoken of. After having supplied the liver cells with the elements to form bile, the blood is again collected by the minute branches of the hepatic veins, which go to form two large trunks—the *vena cava*—by which the blood is returned into the general circulation. Now, when fluids are taken into the stomach, they are absorbed directly through their coats by the veins which are so freely distributed over the inner surface of the organ. In this way the alcohol passes into the liver, and it is for this reason that the free use of stimulants, when the stomach is empty of food, is so pernicious. It is a matter of common observation that drinking, even in excess, after dinner is less injurious than drinking before dinner. Alcohol mixed with food becomes in great part blended with and carried by it into the intestines. It thus becomes diverted into other channels, and having been taken up by the absorbents, if only present in moderate quantities, becomes completely digested and subservient to the support of the heat and the nutrition of the body.—*People's Magazine*.

Art.

Sculpture.—The first of six lectures, an introduction to the course, by Mr. Weekes, R. A. Professor of Sculpture in the Royal Academy, was delivered on Monday evening, 14th ult. There was a large audience, including several of the leading Academicians, with many Artists and lovers of Art, besides the students of both sexes. The lecturer, in a very interesting manner, dwelt on the position of the art of Sculpture in England at this time compared with that which it held in ancient Greece. He defined the relations between this and the sister art of painting; and showed very clearly how sculpture was the more likely of the two, to suffer deterioration from any mistaken attempt to produce the effects peculiar to the other method of representation. Within its proper range and scope, the expression of ideas by means of form, sculpture ought to keep to the beautiful and graceful, rejecting whatever is fantastic, quaint or grotesque, eccentric, vulgar or mean. For the observance of this rule, he commended especially the study of Grecian Art in the fifteenth and sixteenth

centuries for the expression of mental power. But he disapproved of the choice of antique or foreign mythological subjects; English art, he said, should take its subjects from the events and personages of national history, from the conceptions of our best standard literature and from the sacred narratives of the Bible.

The importance of moral and intellectual culture to the genuine success of the young artist was unaffectedly impressed. Mr. Weekes prescribed the reading of his great predecessor Flaxman's lectures as the best practical treatise on sculpture in English, but observed in them a want of exact analysis of the reasons for the excellence of those examples and models which he admired. This deficiency will probably be supplied in the future lectures, with a demonstration of the essential principles of sculpture. We understand that the Council of the Royal Academy is making some arrangements to strengthen the teaching of the classes in sculpture; and the addition to its revenue from the bequest of Gibson's whole fortune cannot be more fitly applied.

—*A Monument to Poland.*—The Polish patriots have determined upon erecting a monument commemorative of the struggles of Poland to regain her national independence. The site chosen is in one of the most beautiful districts of Switzerland, on the heights of Rapperswyl, bordering the Lake of Zurich. This memorial will consist of a column of black marble, 28 feet high, standing upon three platforms of granite, each of the latter serving as a step up to the pedestal. On the summit will be an eagle with outspread wings. Historical inscriptions and arms of Poland are to be carved upon four tablets on the lower part of the shaft; and the whole will be surrounded by an iron railing. The work will be completed in the course of the summer. A circular from Count Ladislas Plater, dated Villa Broelberg, near Zurich, April 22, has been issued, in which an appeal is made to all who have the cause of Poland at heart to assist in carrying out this patriotic demonstration.

—We learn from *Nature* that Dr. John Davy, brother of Sir Humphrey Davy, has bequeathed to the Royal Society, in fulfilment of an expressed wish of his illustrious brother, a service of plate, presented to Sir Humphrey Davy for the invention of the safety lamp, to be employed in founding a medal to be given annually for the most important discovery in chemistry made in Europe or Anglo-America.

—Attempts are being made in Italy to raise a subscription for a statue of Raphael, to be erected at Urbino.

—A statue to the French General Duplex, so well known in the last century of history in India, is now in progress at Pondicherry—a tardy tribute.

Rotany.

—*The Victoria Regia.*—This magnificent plant has thriven to an unprecedented degree during the past summer in the Botanic Garden at Ghent. Several leaves have attained a diameter of nine feet, and have supported a weight of 250 lbs., and one even the enormous weight of 500 lbs. Seven of the gigantic leaves completely covered the basin of 164 feet square, and they were obliged to be removed to make room for the young leaves which continued to develop in the centre. Every four or five days a fresh flower appeared, which lasted only two days, or rather two nights, opening in the morning of a perfectly white color, diffusing about five or six P.M. a very powerful odor of vanilla, closing the next morning at 8 or 9 A.M., opening the same day towards evening, this time of a beautiful carmine, and finally closing the next morning. The magnificent leaves last through the summer; the plant begins to dwindle in October, and dies towards December. About this time the seeds, which have been obtained by artificial fecundation, arrive at maturity. They are sown in January, and appear above the ground in about six weeks. Their infancy is very critical; but once past this period, the young plants grow with astonishing rapidity; the plant in the Ghent Botanic Gardens, unquestionably the finest that has ever been cultivated, arrived at its full development in five months.—*Nature*.

—*A Rare Plant.*—There is at present in the possession of Mr. George Terrey, a builder in Clerkenwell (says a letter in *Gardener's Magazine*), a most remarkable plant, for which the owner has refused considerable sums of money. It is about the size of an ordinary gooseberry bush, and although living and growing bears no semblance of vitality. It has no foliage; but little pellicles of flint bud out of the twigs and stems, which are likewise encircled with rings of flint at every joint. In some places the flint which it appears has exuded from the plant itself, cases the stems like a pipe. The plant looks black and dead, but the twigs instead of being brittle like wood, are tough as leather thongs. It has been suggested that the flints which form so large a component of plant life, has, by some freak of nature, been eliminated from the natural vesicles of the plant and developed outwardly instead. Scientific men from various public institutions and learned bodies have inspected this phenomenon, but

without arriving at any conclusion respecting it, beyond its indubitable singularity.

—*Transplanting in the Night.*—A gentleman anxious to ascertain the effect of transplanting in the night, instead of by day, made an experiment, says *Bow Bells*, with the following result:—He transplanted ten, cherry-trees while in bloom, commencing at four o'clock in the afternoon and transplanting one each hour until one o'clock in the morning. Those transplanted during the daylight shed their blossoms, producing little or no fruit, while those planted in the dark maintained their conditions fully. He did the same with ten dwarf trees after the fruit was one third grown. Those transplanted during the day shed their fruit; those transplanted during the night, perfected their crop, and showed no injury from having been removed. With each of these trees he removed some earth with the roots. The incident is fully vouched for; and if a few more similar experiments produce the same result it will be a strong argument to horticulturists, gardeners, and fruit-growers to do such work at night.

Discoveries and Inventions.

—*Invention Relative to Ships' Compasses.*—Having recently noticed the loss of the iron ship *Glenorchy*, in consequence of an unascertained error in her compass, it is right to mention the invention, says the *Globe*, by Mr. W. F. Reynolds, of an instrument, independent of all magnetic influences, for determining the deviation of ships' compasses when at sea. The inventor speaks of it as a simple tool, capable of being readily understood and easily used by an ordinary mariner, without reference to any abstruse calculations, and as reliable and perfect in the practical results of its operations as the methods and formulae of the mathematical navigator. The only misfortune is that a clear sky is necessary to the use of the instrument, since it involves a reference to the sun, or some other celestial object; and a clear sky is what the mariner cannot always command, and most frequently needs when it is most important for him to know the exact position and direction of his ship. The "Pallinurus," however, as the instrument is called, will always assist him in clear weather, and the mariner may be saved from going out of his course. It should be added that a means of ascertaining the "heeling error," to which the loss of the *Glenorchy* was ascribed, is provided in connection with the instrument.

—*Paper as a Material for Clothing.*—The Japanese paper handkerchiefs are assuredly coming, if the *Globe* be right. The paper collar manufacture has now been extended to less prominent but more important garments, of great strength and flexibility, which can be sewn with a machine, giving seams almost as strong as a woven fabric! The inventor has particularly applied it to the production of petticoats, which are either printed in imitation of the fashionable skirts of the day, or stamped out with open work of such beauty and delicacy as no amount of labour with scissors and needle could imitate. The marvel is that these really beautiful productions can be sold retail at 6d. each! Imitation cretonnes and chintzes for bed furniture are also made, a set costing retail about 5s. The felted material "is so flexible that a curtain may be twisted into a rope and shaken out again, showing as little creasing as a chintz similarly treated." There are also table-cloths embossed with designs of great beauty. This felted paper may in the end have a serious influence on the production of the woven fabrics it is intended to displace. Imitation leather, impermeable to water, is likewise made of it, and produces a cheap and useful covering for furniture, and even serves for shoes.

—*Indicating Localities.*—An ingenious plan has been devised, the *Athenaeum* reports, for indicating localities and distances in London. The Thames, from the most eastern point to Westminster Bridge, and a line thence to Hyde Park Corner and Knightsbridge, are considered as an equator, from which it is proposed to measure distances of a quarter of a mile each towards the north and south, and denote them by increasing numbers, similar distances from west to east being denoted by alphabetical letters. Both numbers and letters are to be put up in every street and on every lamp-post, so that a person may readily ascertain in what direction he is going, and how far he has gone. Thus, by observing that he has passed from A 3 to A 4, he may know that he has gone a quarter of a mile towards the north or south of the equatorial line. Similarly, his advance from A 4 to B 4 would show he had gone a quarter of a mile from west to east. Addresses might thus be given with greater precision and distinctness than at present, and many disputes about cab-fares be obviated.

—A large room has been discovered at Herculaneum which must have served for a kitchen. In it was a wooden clothes-press, entirely carbonized; also 14 vases, a candelabrum, and a lamp, all in bronze, several vessels in glass and terra-cotta; a small marble statue of a fawn, and two broken tables, one in marble and the other in slate. These excavations are carried on by means of the grant of \$6,000 by King Victor Emmanuel, made for that object.

Meteorology.

—From the Records of the Montreal Observatory, lat. 45° 31 North; Long. 4h. 54m. 11 sec. West of Greenwich, and 182 feet above mean sea level,—for Feb., 1870,—By CHAS. SMALLWOOD, M.D., LL.D., D.C.L.

DAYS.	Barometer corrected at 32°			Temperature of the Air.			Direction of Wind.			Miles in 24 hours.
	7 a.m.	2 p.m.	9 p.m.	7 a.m.	2 p.m.	9 p.m.	7 a.m.	2 p.m.	9 p.m.	
1	29.780	29.917	30.101	14.0	22.2	3.9	W	W	W	94.00
2	30.302	30.199	.200	-4.6	1.9	1.6	NE	NE	W	77.12
3	.351	.496	.551	-2.0	7.1	1.9	nby w	NE	NE	114.12
4	.699	.622	.611	-7.4	14.0	3.7	N	NE	NE	180.00
5	.400	.321	.298	5.7	22.4	17.9	NE	NE	NE	94.47
6	.248	.243	.250	17.3	17.0	21.1	SW	NE	SW	89.29
7	.202	.247	.201	19.0	24.4	25.0	NE	NE	NE	74.12
8	.061	29.817	29.661	23.8	26.4	24.0	NE	NE	SE	60.00
9	29.499	.501	.507	24.0	31.6	28.4	NE	NE	SE	187.74
10	.675	.711	.804	23.0	30.0	17.6	NE	SE	NE	71.00
11	30.122	.914	.800	1.1	28.0	16.0	N	S	NE	91.19
12	29.289	.313	.749	29.1	31.7	20.2	SW	W	W	61.11
13	30.225	30.223	30.225	1.0	13.9	4.9	W	W	W	271.12
14	29.957	29.815	29.647	2.2	22.0	21.2	NE	NE	NE	311.10
15	.750	.917	30.049	23.7	38.2	31.1	W	W	W	204.11
16	30.347	30.371	.498	10.2	27.2	16.0	W	NE	W	80.19
17	.551	.309	.171	0.1	14.2	26.1	N	NE	NE	67.24
18	29.769	29.499	29.500	34.0	36.7	31.1	SW	SW	W	81.00
19	.834	.997	30.089	9.0	25.1	10.0	W	W	W	311.17
20	30.184	30.014	29.921	5.0	21.0	16.1	W	NE	NE	121.00
21	29.847	29.799	.725	5.0	8.0	-1.9	NE	W	SW	197.74
22	.712	.722	.751	-5.1	8.9	5.1	W	W	wby s	318.19
23	.624	.631	.655	11.0	18.3	15.7	wby s	w s w	W	171.00
24	.700	.699	.650	11.7	20.5	4.3	W	W	W	96.17
25	.597	.599	.600	2.0	23.1	13.2	W	W	W	191.44
26	.648	.750	.800	10.1	24.2	22.0	wby s	wby s	wby s	109.21
27	.801	.714	.650	8.7	29.0	24.0	NE	SE	NE	120.00
28	.499	.474	.467	25.1	32.2	30.1	NE	NE	NE	94.12
..
..

Remarks.—The highest reading of the Barometer was on the fourth day, and was 30.699 inches. The lowest was on the fifth day, and was 29.298, giving a monthly range of 1.401 inches.

The highest temperature was on the 15th day, when the thermometer indicated 38° 2. The lowest was on the fourth day, and was 8° 1 (below zero). The mean of the month was 16° 70, which is a trifle higher than the isotherm for Montreal.

Rain fell on one day, amounting to 0.922 inches. Snow fell on 13 days, amounting to 28.98 inches, which is 44.38 inches less than the snow fall of February, 1869.

— Meteorological Observations taken at Quebec, during month of February, 1870; Latitude 46° 48' 30" North; Longitude 71° 12' 15" West; Height above St. Lawrence 230 feet,—by Sergt. John Thurling, A. H. C., Quebec.

Barometer, highest reading on the 4th.....	30.481 inches.
“ lowest “ “ 25th.....	29.121
“ range of pressure.....	1.360
“ mean for month (reduced to 32°).....	29.604
Thermometer, highest reading on the 27th.....	44.0 degrees.
“ lowest “ “ 4th.....	-14.3
“ range in month.....	58.3
“ mean for month.....	16.0
Hygrometer, mean of dry bulb.....	16.1
“ “ wet bulb.....	14.4
“ “ dew point.....	1.4
“ elastic force of vapour.....	.046 inches.
“ vapour in a cubic foot of air.....	0.5 grains.
“ “ required to saturate do.....	0.6
“ mean degree of humidity (Sat. 100).....	51
“ average weight of a cubic foot of air.....	577.8 grains.
Cloud, mean amount of, (0-10).....	7.4
Ozone, “ “ (0-10).....	3.5
Wind, mean direction of “ North.....	4.25 days.
“ “ “ East.....	8.00
“ “ “ South.....	5.25
“ “ “ West.....	8.50
“ “ “ calm.....	2.00
“ “ daily horizontal movement.....	163.7 miles.
Rain fell on.....	3 days.
Snow fell on.....	16 do.

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Montreal, March 16, 1870.

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