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THE

JOURNAL OF EDUCATION.

FOR THE PROVINCE OF NOVA SCOTIA.

THE attention of teachers is specially directed to the notice of the examination. There will be no other examination till the close of the next term.

THERE are 116 teaching days in the present term. Trustees and teachers may easily verify the above number by perusing the official notice in another column, concerning "Holidays and Vacations."

EVERY board of trustees should be fully prepared to present to the annual school meeting on the 21st of October, a clear and accurate statement of their transactions for the year, and to inform the meeting what funds in their estimation will be sufficient for the meeting to vote, in order to provide adequately for the maintenance of a good school, during the ensuing year. The meeting will properly look to the trustees, to recommend the adoption of whatever is needed for the improvement and efficiency of the means of education employed by the section.

Let every section determine to support a good school, and to do it, not grudgingly, nor of constraint, but cheerfully and with a willing mind.

THE NEXT ANNUAL SCHOOL MEETING.

IT is provided by law that the annual school meeting, "shall be held in the school-house of the section, or if not commodious, or if its use cannot be obtained, or if there is none, in any other convenient building, on the THIRD MONDAY IN OCTOBER; the meeting to be called by the trustees, or, where none exist, by the inspector, by notices posted in three public localities within the section, five days previously, signed by the trustees or the inspector, as the case may be." Trustees must on no account fail to give the required notice to the inhabitants of their section. Where sections are without trustees, the people should see that the required notices are procured in time from the Inspector, and properly posted.

Of the three members of the board of trustees existing on the 21st of October next, one of those members who have been the longest in service is to go out of office by ballot, whether the members of the board were elected at a former annual or special meeting, or were appointed by the School Commissioners. The vacancy thus made is to be filled by the election of a trustee. The trustee who retires, may be re-elected if willing to serve, his term of office, to date from such re-election.

One of the most convenient modes of voting by ballot is for each rate payer present to write upon a slip of paper the name of the trustee who he thinks should retire. The chairman having counted the ballots, declares the office of him who receives the largest number to be vacant. A ballot is often taken by the use of objects of two colours, or kinds, as black beans and white beans, beans and peas. It is of no great moment what materials are used, the object being merely to enable the rate-payers, in a delicate way, to determine which trustee shall vacate his office.

Where the three trustees have been in office for the same period, it will be necessary to determine which of the three shall retire. The ballot must in that case be repeated if necessary, till one has received the vote of a majority of the ballots. Any section without a board of trustees, must of course elect three trustees.

The office of trustee is most honorable, and only persons of intelligence, business habits, and educational zeal, should be chosen as trustees. Such men should not shrink from a faithful discharge of the duties imposed upon them by the people. All should remember that society has claims upon them, and that no claim can be stronger than that which involves the welfare of the young. Good trustees will generally secure good teachers, good accommodations, and good schools.

A spirit of liberality should be shown by the rate-payers, in providing for the support of their schools. Ample provision should be made for comfortable and clean rooms, a good supply of school books and necessary apparatus, the teacher's salary, in short for whatever is needed to carry on successfully the great work of education. In this way, the sections will have little difficulty in obtaining the services of the best men, as trustees. Such trustees will carry on the school as economically as is consistent with the best interests of all, and however large the amount voted, they will expend only what is needed.

The rapidity with which the means of education are multiplying in all parts of the Province is full of assurance that a system of FREE SCHOOLS is admirably adapted to meet the educational wants of Nova Scotia.

ON TEACHING AS A PROFESSION.*

THE subject which I have chosen for my address to-day is our professional position in the country. This subject has the disadvantage of being commonplace enough, but however commonplace it may be, the matter is of too vital importance to all of us, and to the best interests of society, to be treated at any time with indifference. And especially at the present time, when there is much educational excitement, and educational projects are ventilating on every hand, it cannot be too widely or too thoroughly discussed.

We have to start from the mournful fact, recognised and deplored by all of us, that the teaching profession is not one that of itself gains much respect for its members, and that the attractions which it presents are not very inviting. But if the evil to be deplored were merely that a certain body of men do not mingle in select society, and do not receive the honours due to them from the public, I should not have thought of taking up the subject at all. A remedy of course should be attempted for every evil, but when the evil is one merely inflicted by the world's opinion, it is of comparatively small importance. The world, in the sense in which the term is used, is always small, and its opinion not worth much. Providence has generally supplied ample compensation to those who lose the world's honours in the performance of substantial work. And in the case of the educator, his work and his position rise in estimation in proportion as the person estimating is capable of understanding the value of what is really good and important.

I have a different object altogether. I believe that the elevation of the teaching profession means the spread of sound education. I believe that it is of primary importance to the well-being of the community that the profession should be elevated, and I believe that all the measures which I propose for the elevation of the profession are absolutely essential to the thorough education of the people. The schoolmaster is the school. In the work of education, the man who educates is everything. And I conceive that our people will not be properly educated until the public come not merely to assent to this truth in an indifferent way, but to realise it as a great truth, and to perceive the many applications which it admits of.

Whatever may be the reason why the teaching profession is held so low, it certainly cannot be found in the nature of the work which is accomplished. Let me compare it with what are called the learned professions, medicine, law, theology. In such a comparison, we have to look out for some standard by which we may measure them. Now I think it will be granted that a profession rises in dignity in proportion to the influence which it exerts on the well-being of mankind. By well-being I include the physical as well as the mental or spiritual. Both interact on each other. Physical well-being is calculated to promote spiritual, as it frees a man from many temptations, and gives him power for the work he has to do on earth. And it is not possible to conceive spiritual well-being without its affecting or rather including physical well-being to a large extent. For all those virtues which relate to the appetites and passions, temperance, self-restraint, contentment, and such like, are powerful agents in the creation of physical welfare. Yet, at the same time, I think that it will be allowed there may be differences of dignity in the various operations, that the man who promotes the spiritual well-being is employed in higher work than the man who promotes the physical, essential as that may be. And

* Address delivered at Stirling to the Scottish Central Schoolmasters' Association. By James Donaldson, LL.D., Rector of the High School.

we may estimate the importance of the work done by further considering in what way it tends to promote and elevate the whole man, and to what extent.

With these principles then we turn to the medical profession, and we look out for what we may call its special purpose. Can we, in one word, say what it aims at; and if we can, will our standard help us to estimate the relative importance of the aim? Now I do not think any one will accuse me of going far wrong if I define the aim of the medical profession to be the cure of diseases. Its aim is not to promote the physical well-being of man directly. It waits until some great wrong has taken place in the frame, and then it steps in and attempts to overthrow the obstruction, and send man again on in his ordinary course. It does not, properly speaking, cover the whole of a man's physical career, but when that physical career swerves from the right path, then it comes forward to turn it again into the right path. Now for my part I do not think that this aim is in itself so high an aim, nor is the healing work so high a work, as keeping the body out of disease. A higher art, in every way a nobler art, would be the maintenance of the body in sound health. Medical men have contributed much to a knowledge of those laws which are the conditions of health, and for this they deserve the gratitude of mankind; but as the medical profession is at present constituted, this work of prevention does not lie in their way as a profession. The nobler part of the work really lies in teachers' hands, though the work is very imperfectly done, for it is their business to inculcate on their pupils those laws of health which will keep them out of the hands of the doctor.

Nor has the medical man much to boast of in regard to the certainty of his operations. The subject of investigation is perhaps the most difficult of all the subjects submitted to man's consideration. He has to experiment in the dark, he can see the most vital parts only after they have lost their vitality, and he can ascertain most of the results of experiments on living beings, only when life has ceased to exist, and the conditions are entirely altered. Hence it is that, while skilful medical men are well able to recognise most diseases, their methods of cure are purely empirical, and they will themselves be among the first to confess that their skill is human, and that they work at a peradventure.

Let us look now for a moment at law. What should we say is the aim or purpose of the legal profession? We must here divide its aim according as lawyers have to deal with criminal or civil cases. The aim of the legal profession then, as far as criminal cases are concerned, is to put down scoundrels. It deals only with those who break, or are supposed to break, the laws of their country. In other words, it deals with some of the mental diseases of the lowest class of people. But it does not go the length to which medicine goes in dealing with bodies. The lawyer does not grapple with the mental disease. He does not, professionally at least, attempt to elevate the scoundrel. He merely puts an extinguisher on him for the time; but the scoundrel may remain a scoundrel, nay, may be a worse scoundrel than before. In civil cases it is somewhat more difficult to give in one word the aim of the legal profession. But here also for the most part it is to prevent the action of the violent passions of one class from doing injury to other men. The aim is not to change the mind of the grasping or quarrelsome litigant, but to prevent him doing harm. And the character of the work done may be fairly gathered from the advice given by sensible lawyers, that he is the wisest man who has nothing to do with law. I have in these remarks made no mention of what perhaps should be stated as the real aim of the legal profession, to protect the great mass of the community from the depredations of scoundrels and rogues. This is a grand result. But as I am speaking of professional activity, and as this is a purely negative result, it does not come exactly within my range. Positively lawyers have to deal with the lowest portions of the community for the most part, they have to deal with the lowest phases of human life; and they have to deal with these, not in the way of radical reformation, but of temporary forcible repression of outward manifestation.

We turn to the third class of learned professions, that of the minister or clergyman. It is much more difficult to state the aim of this profession, because people conceive the aim differently according to creed and tradition, and because he may, if he is so minded, identify his aim as a man with that of his profession. Thus, for instance, I hold that it is not an especial aim of the clergyman's profession that he should turn the souls of men to God. This I consider the grandest and noblest work on earth. This work, too, I take it, assumes two forms in the present day in Christian countries. The first, and I believe the highest, is when the preacher, or teacher, or parent, or whoever he be that can do it, takes the child from the earliest years, and through God's blessing, so trains him in God's ways that he is a child of God from his childhood. The other form is when the preacher, teacher, or whoever else it be, through God's blessing, turns a man who has been self-seeking and selfish to see the necessity and pleasure of having God's reign in his heart, and thus turns him from an earthly and selfish life to a heavenly and divine life. But this is not specially the work of the minister or clergyman. This is the work of every Christian, whatever be his profession; and it is a work accomplished most frequently, not by words, but by the beauty, consistency, and force of a noble Christian life. But then he may identify his duty as a Christian with his duty as a Christian minister, and use the facilities of his professional life for the advancement of this greatest of all objects. But what is his special professional work, what is the

object or aim in setting apart a certain number of men for what is called the ministry? I shall set down two aims, according to different opinions. One is, where much value is attached to preaching, that there should be a special set of men, thoroughly masters of all theological learning, who shall be able at once to defend the faith against attacks, and fully expound the Bible in its true meaning. Part of their business is of course to urge men to a change of life, as all Christians are bound to do, and to give to those who are attempting to live a heavenly life full directions in their career, encouragement or admonition as may be needed. Then again there are those who think that preaching is of comparatively little use, but who think that the clergyman ought to visit all his flock, to encourage, direct, guide, and console them. Whichever view is taken of the clergyman's functions, it seems to me that their importance and dignity are of the highest. His aim may be defined in one word, to awaken the greatest amount of spiritual life that he possibly can, and no aim could be greater or grander. I am afraid, however, that if we take average cases, we shall find that his work is not so important as its aim would lead us to expect, and that owing to some circumstances connected with his hearers. His hearers may be so ignorant or so hard-worked during the week that they prefer a good nap to his sermon. Or they may have gathered round him because they approved of his views, not to listen to his instructions, but to be pleased with hearing their own opinions well expounded. And their habits and ways of thinking and acting may be so confirmed, that his most eloquent appeals produce no effect.

These are the three learned professions; I might have added two others, which, for real spiritual influence, rank with the clerical, and far above the medical or legal, the press, and the profession of literature. But my purpose served by taking those usually denominated learned.

Now take the teaching profession, and let us see what is its aim? Its special aim is to give a thorough cultivation to the intellectual powers of man, but through the intellectual it aims also at just ideas, and right habits, in regard to physical well-being and all spiritual well-being. The parents are the persons specially bound to look after the whole culture of their children; but the teacher steps in to take part of his work entirely from him, and to help him in all the rest. Now I need not say that, by the very statement of the aim, I have really exhibited the superiority, in importance and dignity, of the teaching profession to those either of medicine or law. I do not think it superior in aim to that of the clergyman. But I think that there are certain advantages on its side which give it strong claims to special prominence. The period of youth is the period when character is formed, when the mind, being flexible and pliant, is shaped. Some maintain that at the age of seven the bent of a man's mind is permanently fixed. I do not think this is true. But I think that not one in ten thousand alters to any considerable extent in the mould of his mind beyond the age of twenty; most are fixed at a much earlier period; and there are exceedingly few who, like Solon, go on learning new methods of thought, and open to new ideas, till old age. Now, the schoolmaster has hold of the child just at the age at which he can act most powerfully over him for good or for evil. He does not, like the clergyman, act upon the formed mind at comparatively long intervals. He has the child under his plastic hand, day after day for hours. In fact, no single person has anything like the same opportunity of influencing the child's mind, except the parents. I do not wish to attribute too much power to the schoolmaster. I believe that public opinion, the family circle, the companions of a child, and many other conscious or unconscious educational agencies, are more powerful than the school or the schoolmaster; but take any one single agent in the fashioning of the child's mind, and none, except the parents, and sometimes not even the parents, have the same opportunities and the same facilities for giving the direction to the child's mind. And this influence of the teaching profession is not merely great intensively, but it is equally great extensively. Medical men, as we have seen, after once helping people into the world, have to deal with the diseased only, and solely when they are diseased. Lawyers have to deal with scoundrels and litigious persons, and they see these generally in their worst aspects, or at least in very bad aspects. There are hundreds and thousands of our population who never hear a clergyman, who never see him in their houses. But most people actually have come through the hands of the schoolmaster, and have been for a considerable period, hours every day, under his influence; and those who have not, ought to have been, and I hope will soon be compelled to be. There, then, is a profession which wields mighty power, with vast facilities for influencing the destiny of every man in the kingdom. How does it happen that this profession should stand so low in public estimation?

Various reasons can be assigned for this. One especially stands forward. The public have not come to realise the immense spiritual force exerted by schoolmasters. They have not the slightest conception of what incalculable benefit would accrue to a nation were the whole body of its schoolmasters thoroughly fit for their work, and completely furnished with the best means and methods of carrying on their work. Professed thinkers have long ago seen the power that might thus be brought to bear on mankind, and it were easy for me to quote a long roll of testimonies to this effect. But the great mass of people have a difficulty in estimating spiritual forces, unless they shew their strength in some outward compact aggregate. Now, the teaching profession is not a compact

body, but a loose congeries of persons, totally unfit, partially fit, and entirely fit for their work, united by no common organization, presenting no aggregate front. They say there are 60,000 teachers in England. Suppose that there are 20,000 in Scotland and Ireland. Here we have 80,000. And suppose that those men were all intelligent and up to the mark, that they were united in one organization, and connected by a common tie, would not the influence of such a profession be felt at once and powerfully?

This, then, is the main reason. But it presents itself in various aspects. And I now ask you to look at the matter from the points of view suggested by the comparison of professions which I have instituted. How is it that these professions have gained the respect which has been accorded them?

I think there are two special circumstances which have helped them much: the one, that peculiar technical knowledge and practice have been insisted on as requisite for the exercise of them; and the other, that they have been recognised by government. Both these points are of special interest to us.

Medical, legal, and theological students go through a course of special training. This course fits them for their work, and the want of this course incapacitates a man for being a member of the profession. There is thus a strongly marked line of demarcation drawn between those inside and those outside of each profession. This is not the case in the teaching profession. Some time ago, a man who was fit for nothing else could earn a livelihood by teaching; and all kinds of people, young and old, ignorant and learned, have set up as teachers without any special preparation. The question that remains for us to answer is, Is this a right or a wrong state of things? I answer unhesitatingly that it is a wrong state of things, and I shall give my reasons for so thinking.

A great many people imagine that any one can teach who knows the subject he professes to teach. This opinion shews a complete ignorance of the nature of education, and the work of the educator. The teacher has something more to do than simply to make children learn one lesson after another. If he is to do his work thoroughly, every lesson will educe power in the child, and he will be continually conferring impulses in a spiritual direction. The real educator has in his mind the full evolution of the child's powers, and he has to weigh every article of intellectual pabulum according to the amount of force it will have in producing the power which he seeks to educe. He has also his eye on the well balanced evolution of power. To do all this the teacher must be a psychologist. His whole conduct must be directed by the laws of psychology. He has not merely to know his subject, but he has to know what parts of his subject are suitable to the child, what unsuitable. He has to know what method of presenting his subject is in accordance with nature, and what contrary to nature, and therefore injurious to his main object, the evolution of the child's powers. And he must make himself acquainted, not merely with the laws of intellectual evolution, but with the laws of the emotional nature, because he has to deal with the child through the heart as well as the head. I have a strong conviction that this thorough knowledge of psychology, in its application to the nature of children, is absolutely necessary, both from the nature of the case, and from the experiences of teachers. From the nature of the case, because it is plain that, however skilful a teacher may be without this knowledge, he is not proceeding systematically to work, he does not know really what he is aiming at, and whether he is using the means suggested by nature, and he may be nonplussed at once by an unusual occurrence. The teacher who has no such knowledge has likely no idea of how to teach, or he has seen some one teaching before, and he merely imitates. In both cases the results will be unsatisfactory.

My conviction is also based on experience. The most difficult task which was ever set me in the teaching way was teaching a sweet little girl, of between three and four years of age, the alphabet. I was a student at college, and an offer was made me of this piece of teaching. I knew my alphabet well enough; but I tried for two months to teach that sweet little child, and failed most completely. The child was timid. She could not sit with comfort beside a stranger. And she could not for sobs utter the names of the letters. And I did not understand her. I did not know how to overcome her fears, I did not know how to draw her attention away from herself, I did not know how to make capital fun out of the A, B, C, and so I had the mortification of failure. I taught Greek in the Edinburgh University, too, and I taught Latin in the Stirling High School, and during the first three years of this my teaching career I was groping in the dark. I had plenty of impulse, and gave that to my pupils in abundance. But, looking back on these years, I know now that I needlessly put difficulties in the way of my pupils, that I was ignorant of the nature of their minds, and made mistakes in consequence. It was not until I had made a thorough study of psychology, as it can and ought to be applied to the minds of boys, that I saw clearly the right methods to pursue, the amount of work to be prescribed, the endless, varied repetition necessary, and many like things. And I feel this also, that one makes great progress in the art of teaching; that, even after you know the right methods, experience widens, and widens your knowledge, gives you a firmer and surer grasp of the boys' minds, and you proceed with greater certainty in regard to the result. I may point to two other facts, as facts of experience, in regard to this matter. The teachers in the great schools of England are all highly educated men, and yet the Report of the Commissioners states that their teaching, taking it as a whole, has been

a miserable failure. Why? Because most of them do not know how to teach. They employ methods that violate every law of psychology. They persist in practices which psychology pronounces injurious to the human mind. And you will find in the answers of some of them, opinions in regard to teaching, which it is perfectly marvellous that a sane man could entertain. For instance, more than one state that it is better for them not to go into society, but to continue teaching nearly the whole day, because society would turn their minds away from the subject of education, and they would thus get out of the tone requisite for teaching. The men seemed to have no idea of the value of change of exercise and relaxation, both for teacher and pupil. Look from these to the students of our Normal Colleges. These, I am sorry to say, are not always so well educated as they might be. It is certainly not their fault, for if the students had the power, they would make different arrangements. Still, they do study methods of teaching, and learn somewhat of applied psychology. And there is no doubt that they turn out good teachers, that they are well able to use what they have got.

This applied psychology, then, is the teacher's special technical work. I know that some may be inclined to assert, that we have psychology far enough advanced in its investigations to form a basis for a practical training. I deny this out and out. I maintain, on the contrary, that psychological researches have established the laws of the mind far more exactly than physiological investigations have disclosed the laws of vital action. And, in proof of this I can appeal to such works as those of Professor Bain on the Intellect and the Emotions, full of sounds generalizations, and to those of Currie and Morrison, as full of just applications of the laws of mind. My opinion in regard to this matter is stronger than most; for I believe that one philosopher of Germany has established psychology on a thoroughly scientific basis, and that his system of psychology at every turn affords irrefragable principles of action and criteria of methods. I mean Beneke. He saw clearly that three great difficulties lay in the way of a true psychology: first, the continual meddling with questions which there is no possibility of settling, and in regard to which all that can be done is to settle the limits of human knowledge by an investigation into the processes of our thought; second, the commingling of physical in the explanation of psychological phenomena, as if the chain of causation in mental phenomena could be disturbed directly by physical agencies, while the physical cannot be disturbed directly by mental; and, thirdly, the failure to observe the immense complication of all mental phenomena. Tearing himself clear from the first tendency, he resolutely adhered to the determination to explain mental phenomena only by mental laws; and watching the human mind with great patience, he analysed and analysed until he got at three or four fundamental processes by which he thought he could explain almost all mental phenomena; and I think he has succeeded wonderfully. I do not say that the science is complete. He himself would have been the last to maintain that. It is a science based on observation and analysis for the most part, and therefore it requires the help of many minds. But I say this much, that it is so far complete, that it can be used by the teacher at every stage of his career, alike for the intellectual, moral, and aesthetic culture. It enables the teacher at once to gauge the value of the methods which he is pursuing; to estimate the educational value of the matter which he is giving; to measure the intellectual force of the pupil; and to put your finger on the special deficiency characteristic of his mind, and to battle in a successful manner against the special diseases of the soul. As Beneke laid great stress on his exposition of the complicated character of mental phenomena, he paid special attention to the processes of thought, as exhibited in children, because they are more simple in these. And, accordingly, he wrote a very important book on education, containing, as I think, the finest, most philosophical estimate of the various branches of study in Education, and a thorough exposition of the natural methods. His work has had a most powerful influence on the teaching of Germany. His psychology has been hailed and cultivated by German teachers; and I have no doubt, when it once becomes properly known in this country, it will exercise a great influence.

There is then a science of Education, a science not merely in its rudiments, but worked out with considerable fulness; and those who have asserted the contrary, seems to me to betray their ignorance of what has been done in this field, and their readiness to pronounce an opinion before they have investigated a subject.

But besides this technical knowledge, the teacher has to communicate impulse. The thirst for knowledge is natural to man; but somehow or other, in the course of life, the thirst for knowledge, especially of the higher kind, soon ceases to exist, and he becomes satisfied with transient and less spiritual pleasures and occupations. Now it is the business of the teacher to stimulate the pupil's desire for knowledge in every direction. And this impulse can be given only in one way. It can be given only from the teacher's own heart and life. In other words, the teacher must keep up and intensify his own desire for knowledge, his own eagerness in the pursuit of truth. He must be a genuine and hearty student. The man who ceases to study is not fit to be a teacher, or, at any rate, is not fully equipped for the work of education. And hence the necessity of giving the teacher as thorough an education as possible at the commencement. Every teacher should be able at least to take the degree of M.A. Indeed, if he does not reach this point, I do not see how he is to make a thorough mastery of the psychology which he has to apply

in his daily life. It is for this reason that I regret so much that the standard of our Normal Colleges is so low in respect of scholarship, and I trust that the proposal made again and again by some of the wisest men connected with these colleges, of uniting in some way a university course with a normal college course, will be looked on with more favour than it has hitherto received from Government. Every increase of intellectual power on the part of the teacher, is so much gain to the pupil; and the country would be infinitely benefited if all teachers were equipped with a university training and apprenticeship, before occupying the post of independent teachers. I need not say also, that such equipment is calculated in no ordinary degree to raise the character of the profession. The Edinburgh Bar has long held one of the foremost, if not the foremost, place in the professions; and one of the reasons, perhaps the main reason, was, that it exacted from all its members the culture of gentlemen. Where'er a high standard of liberal culture is exacted from every member of a profession, that profession will be sure to stand high in the opinion of all cultivated men.

These two things, then, seem to me best calculated to raise the teaching profession,—a thorough knowledge of the Science of Education, combined with the capability of applying the psychological laws to teaching, and a thorough liberal culture. They lie considerably in our own power. We may do much to give ourselves both, by earnest and faithful work; and our strongly expressed opinion, whenever we have opportunity, may pave the way for creating greater facilities to the attainment of both objects for our more fortunate successors.

The other method of elevating the profession is Government Recognition,—recognition by Government of teachers, as constituting a distinct profession. I am favourable to every effort that has been recently made in regard to this matter. I think the originators of the Scholastic Registration Association deserve our best thanks, and I consider that it is our duty to support the movement in every way. At the same time, my convictions lead me to go much further than any mere registration movement. I think the teaching profession, if it is to do its work most effectively, must not merely be recognised by Government, but must be organized by it; that the teaching profession, in fact, in some shape or other, must be the officials of the Government. In other words, education can then only be most effective and most beneficial, when there is a national system of education. And I mean, by a national system, not one which deals merely with schools for the lower classes, as if they only constituted the nation or people, but I mean one which undertakes to regulate the education of all classes of the community, from the highest to the lowest, not altogether it may be irrespective of the wealth and position of the people, but based mainly on the natural differences of intellectual power in young people. My time is too limited to enter into the subject fully: but I shall attempt briefly to prove that education cannot be satisfactory and complete, and that it is impossible to obtain the best men for teachers, unless by combination on the part of the nation; and I assume that the most accessible form of combination open to the whole nation is presented by the existing machinery of representatives and government.

I maintain first, then, that education cannot be given with the most beneficial effect, unless by systematic combination on the part of the community. The demonstration of this point is one on which you, of all men, are best able to judge, and I appeal to you fearlessly in confirmation of my opinion, for I base it on educational experience. It seems to me that for the highest purposes of education it is essential, unless in a few exceptional cases, for the most part the result of previous carelessness, that the education be given to pupils in classes. If you wish to educate certain faculties, and impress certain portions of knowledge on the mind for life, it seems to me that that can be best effected when you have a class of a certain size. It must not be too small, nor must it be too large, though in certain cases the largeness of a class is not a disadvantage, provided all the pupils are well matched. I shall take an extreme case to illustrate my position. Suppose an average teacher advertises that he intends to set up a school, but, going on the limited and exclusive system, he will not admit more than five, each to pay £100. Well, then, five come, but it so happens that the five are at quite different stages, and have minds of different capacity. Accordingly he has to arrange his pupils into five classes, one boy in each; and if he limits himself to five hours' teaching, long enough for a vigorous exercise of his intellect, each boy has one hour of the teacher. Now I say that this one hour of the boy, or two hours, or whatever he may get, will not be so beneficial to him as it would be if he formed a member of a class of twenty or thirty pupils nearly equal to him in most respects. For, first, the boy has no stimulus by measuring himself against his equals. Then the teacher has no opportunity to vary his teaching by repeating the same subject in different ways with different boys. Thirdly, no special call is made on the boy's power of voluntary attention, one of the best results of a good education, and yet necessarily totally neglected where the boy is either alone or with comparatively few. Fourthly, the boy has no chance of seeing the same subject in the various lights in which it will strike boys of different characters. He cannot profit either by the merits or defects of others. And, fifthly, he loses all the benefit of one of the most active agents in educating,—sympathy with others. I am dealing here, you will notice, not with the monetary aspect of this question, nor with the influence which companionships at school will have in after life, but simply with the question as it bears directly on the education of the pupil. And in harmony with what I have now laid down, I should maintain that the larger a school is, the

greater is the chance that the education will be thorough, provided the teaching power is kept up in proportion to the number of pupils. The larger the number of pupils in a school is, the more exactly can they be assorted into the classes perfectly suitable to them, and with greater ease can the teaching power be brought to bear on them. Now, in the vast majority of cases, when education is left to mere chance, it is impossible to get the right assortment of pupils. The classes will be too small or too large, they will be badly assorted, and difficulties in educating them to the full extent possible will be needlessly created.

But, secondly, I do not think that education can be complete without a national system. I shall explain what I mean. Some people hold the *Cam* doctrine in regard to education. They think that the parents should see to the education of their children, and that nobody has any further concern or interest in the matter. Sometimes they go the length of modifying their doctrine a little, and think that perhaps very poor parents should be assisted in educating their children, and that children who have no parents, or merely nominal parents, should also be educated at the public expense. I go a great deal further than this. I maintain that in a community each citizen is bound to feel an interest in all his fellow-citizens, and that all are associated together in a close communion, in consequence of which real good does not come to one without affecting all. For instance, I may not be a proprietor of land, but nevertheless it is a benefit to me that the land should be cultivated to the utmost, and so I have an interest also in the prosperity of our manufacturers. If I have thus an interest in our material prosperity, assuredly I ought to have a greater interest in our spiritual prosperity. Now there is continually born into the country a vast amount of spiritual force. Is it not right that every encouragement should be given to the thorough cultivation of this spiritual power? This spiritual power does not belong to one class exclusively. It appears among rich and poor. The primary duty of cultivating this power rests on the parents, but when the parents are unable, and yet willing, unquestionably it is at once the duty and privilege of the community to present the highly gifted student with the means of prosecuting his studies. Now this is impossible without something like a national system in one shape or another. If education is to be left to mere adventure, class schools rise up on every hand, one set for people that can afford so much, another set for people that cannot give so much, and so down through varying shades. The country is divided into infinitesimal factions from its earliest days, and class feels irritated against class because there is no intercommunion, and no rising from a lower to a higher through education, whatever be the intellectual power of the pupil. The result of such a system must inevitably be a violent outburst of the lower classes, led by men of great but uncultured intellectual power. Happily this is far from being the case in our country. We have in our universities national institutions which are so framed that they are open to all, even the poorest, provided they have talent enough for it. But in our city schools we have gone far from the old Scottish opinion and sentiment. Class schools of every kind have been set up, one set of our people has been systematically trained to look down on another, and hence national rivalries and contests. And the one cure for this is, that our schools shall be organized on the same principles as our universities, that they shall be open to all, and fit for all who are fit for them.

And, thirdly, it is impossible that teachers can have their proper position, or, in other words, that the best men can be procured for the teaching profession, unless some national system be adopted. In regard to this matter, there prevail in many quarters opinions which are totally repugnant to common sense. A considerable number look on education as an article of trade, and they imagine that it should be left to regulate itself by the laws of free trade. It is amazing that people should ever imagine such a thing as this, for fact and reason alike present the most palpable contradictions to it. If it were an article of trade, how is it that its price varies to such an extent over this country, that in some places you will get an hour of Latin for 2s. 6d. in others for 7s. 6d., in others for sums varying from one pound to ten pounds, and that frequently the *hour's Latin* for the ten pounds is the worst teaching of the whole. Here surely is a curious fact for political economists, a proof at any rate that the matter does not regulate itself in a very satisfactory manner. But when you look at the nature of education, then the free trade theory appears in tenfold absurdity. First of all, every one knows that it is of the greatest consequence to make an ample supply of education where there is no demand for it, the want of a demand being the surest sign that there is a strong need for it. Secondly, the educator feels that he is bound by moral obligation to educate, whenever he has the power, without price. Say, for instance, that a poor boy of uncommon powers is presented to me. Now, in regard to such a boy, I would at once feel it my duty and my privilege to educate him to the utmost, if it were within my power to do so, though he should never pay me a farthing. Thirdly, a teacher has only a certain limited amount of educative power within him, which he cannot delegate to others. He can teach only a certain number, and only for a certain portion of the day effectively. So that really the teacher has none of the chances of trade. He cannot give his teaching power to assistants. It is the man himself that educates. There is no such thing, then, as capital in education. Of course some may tell me that men have made first rate commercial speculations in the teaching line. But I simply answer that, so long as the public wish to deceive themselves, and to act foolishly, men may make a thriving speculation out of anything, whether it be spirit-rapping, or learning

Latin in six lessons. And lastly, there is no possible way of determining the price of education, because it transcends infinitely the value of material wealth. For these and many other reasons, the free trade theory seems to me preposterous and absurd, and I may add that I deem it exceedingly mischievous.

What, then, is the principle on which a teacher should be paid? In the professions to which I drew your attention, we see two methods adopted. The doctor and lawyer say in fact something like this to the public: "We offer our services to you, to rich and poor alike. It is impossible to attribute an exact money value to these services. But of course we must have a decent livelihood. And, therefore, while we expect little or nothing from the poor, we expect the richer classes to give in proportion to their means." And so for the same services the doctor gets one sum from one and another from another. To a certain extent this principle was applied to teachers. A fee was fixed which most could pay; and, to make up for the unfair advantage thus obtained by the rich, a day was appointed on which presents were given to the teachers, according to the wealth of the parents. In the case of ministers, the method is different. They, as it were, say, "We have devoted our lives to the service of God and the good of our fellow men. In so doing, we renounce all prospect of making ourselves rich. But we cannot devote ourselves to the work exclusively, unless you undertake to free us from anxiety about worldly means. We expect, therefore, that you will consider what income will be sufficient to keep us and ours in comfort. We do not wish the luxuries of life; but we wish to live in good society, with the homes and habits of gentlemen." It seems to me that this is the principle on which teachers also should be paid. If they are to be thorough teachers, they must devote their lives to the work, they renounce every prospect of becoming wealthy through their profession, and all they demand is that that the community maintain them in a position worthy of the functions which the discharge, and provide for the material wants of them and theirs. The salary in this case is not, properly speaking, the pay for the service done, but the removal of an obstacle which would have prevented the service being done, and the recognition of the value of the service. It is only when teachers are paid in this way that we can expect that the best men will devote their lives to the work of education, and therefore it is only in this way that the educating powers in a country can act with the greatest effect.

And I may notice how the opposite system repels good men, and introduces all kinds of nondescript characters into the work. I shall suppose a case. A B proposes to take up an adventure school. A B is thoroughly fitted for the work of education. But he finds no place for his services in a national scheme. And, therefore, if he is to teach at all, he must set up an adventure school. So far is he from doing anything wrong, that he is a benefactor to the community. But as soon as he begins to think of his project, the first thing he has to settle is to see how he can make it pay. He has to rent a house. This is an unavoidable expense. Then he must procure other teachers. How is he to pay them? He may have generous ideas; but the first duty is to himself. And he must take care not to offer such a sum as might interfere with his own prospects. He takes the risk, and therefore he should have the profits, if any turn up. And so he offers his vacant situations at £40, or £50, or £80 a-year. And who are the men who take these situations at £40 or £80 a-year? Are they teachers? Are they men who are to give their lives to the work of teaching? In nine out of ten cases they are not. They have never studied the science or the art of education. They have no wish to remain in the profession. They are mere birds of passage. They are willing to submit to be ushers for a short time, because the small sum they get will help them through their student course, and land them beyond the tiresome and unpleasant work of teaching. I said that I was imagining a case; but you all know I am describing actual facts. I knew a remarkable man who, when a student, got £80 a year for teaching a class, which paid the headmaster, solely for his instructions, £336. I knew another able teacher who got exactly £70 for what the headmaster got £280. And I knew a young man, of great ability as a student, who got £40 a year for five hours of work. Do you think that these men could teach with their heart in their work under such a system? And it is often these irregular and temporary teachers who are the innocent causes of much harm to the profession. They have no desire to learn the art of teaching. They have no inducement. And so they pass on. Now, I think you will agree with me, that this is a state of matters which ought not to be, that the teaching profession, like other professions, should be so arranged that a young man could look forward to it as his profession for life, that it should be such that there would be inducement for him to prepare himself for it thoroughly, and that the arrangements in regard to it should be such that there would be no openings for the hordes of occasional skirmishers that find their way in and out of it so rapidly. In one word, we should have a national system of education.

I had intended to have said a few words on the hindrances which in this country are likely to stand in the way of a national system, but I have already occupied your time far too long. I hope I have not in any way depreciated the importance of other professions. This is far from my intention, though, in seizing hold of one idea strongly, one is apt to lose sight of others. I have also expressed my opinion freely on some points disputed among teachers; but I hope I have done so without giving offence. What we need in these days is full and free discussion of everything connected with education. Education will not suffer from this. The cause of education is a grand and a glorious one. I believe it has a magnificent

future in store. I believe that its power is but beginning to be realized. You and I are engaged in this noble work at present; and I think we ought to take courage in the midst of occasional annoyances from the consideration of the power we wield over the young minds. It is a great privilege for us to have the opportunity of exerting this power. Let us summon up all our faculties to produce the highest amount of intellectual and spiritual activity among our pupils, to fashion them men of God, thoroughly equipped for every good work; and whether the world honour or despise us, we shall not have lived in vain; and when we leave this scene of action, the spiritual life which we have propagated will continue to spread wider and wider over the generations of men for all great and good purposes.

NUMBER.

A COURSE OF LESSONS PREPARATORY TO THE USE OF A TEXT-BOOK ON ARITHMETIC.

II.

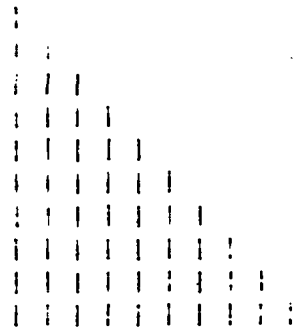
FIRST STEP.—(Continued.)

III.—EXERCISES.

THIS First Step may conclude with the following series of exercises, which are valuable as affording practice on the numbers which the children have learnt to distinguish and to express by name.

The Gradual Increase of Numbers from One to Ten

To lead the children to form an accurate idea of the increase of numbers, the teacher should draw lines on the slate in the following order, and afterward call on the children to name the numbers as they are successively pointed to, and to say how two is formed by adding one to one, three by adding one to two, &c. —



The teacher may then point to any number, asking the children to name it, and then to tell what is the number next above it, and what the next below it.

Again, a number may be mentioned, and the children required to say what numbers are next to it, above and below.

The children may then be called on to state, first by means of strokes, and then in words, what number is between any two numbers named; as, what numbers there are between seven and nine; four and six; eight and ten, &c.

Lastly, the teacher should lead the children to see that numbers naturally increase by unity, and that each number above unity is greater by one than that preceding it. This will prepare the way for the process of addition: thus, one and one are two, two and one are three, three and one are four, four and one are five, &c., to ten. Again: two is one and one, three is two and one, four is three and one, &c., to ten; or, two is one more than one, three is one more than two, four is one more than three, &c.; or, in inverse order, ten are nine and one, nine are eight and one, eight are seven and one, seven are six and one, &c., to two.

Comparison of Numbers with each other as to their General Magnitude.

EXERCISES.—It is not here intended to measure the actual amount of difference between numbers, but only to compare them with each other as to their general magnitude.

In three and four, which is the greater? And in two and six; in three and five; in four and eight; in eight and nine? &c.—which is in each case the greater number?

Tell me a number which is more than three. Now name a number that is more than six; another greater than eight, &c.

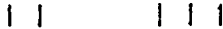
Tell me a number that is less than eight. Another that is less than six, five, and three, respectively. Tell me all the numbers you know that are less than five, four, six, eight, one, &c.

Now tell me all the numbers you know that are more than five, four, six, eight, one, &c.

Four, two, six—which is the least of the numbers I have named? Which is the largest? Then two is the smallest or least of the three, and six is the largest of the three. Now what can I say about the four? That it is larger than the least of the three, and smaller than the largest of the three; for these reasons it is called the mean, or middle number.

what number must be added to the smaller number to make it equal to the larger number

The use of objects or lines must be continued. Suppose the given numbers to be two and three, the teacher arranges objects or strokes thus:



and asks, "How many strokes must I add to the first of these groups, in order to make it equal to the second of them?" The teacher may proceed: "What must I add to two lines, in order to make three lines?" or, "What must I add to two, if I wish to make it three?"

This method must be pursued with all the numbers up to ten, those numbers being commenced with, which present the difference of one. After this, those exhibiting a difference of two; this progression being maintained till ten is reached. As the lessons proceed, the lines or objects may to some extent be laid aside, and referred to chiefly for correction of error, or for proof of accuracy.

EXAMPLES.

To find what must be added to a number to produce another number larger than the first number by one:

To FIVE to produce SIX?
 " SIX " SEVEN?
 " SEVEN " EIGHT?
 " THREE " FOUR? &c.

To find what must be added to a number to produce another number larger than the first by two.

To TWO to make it FOUR?
 " FOUR " SIX?
 " FIVE " SEVEN?
 " EIGHT " TEN? &c.

To produce another number larger than the first by three.

To THREE to form SIX?
 " FOUR " SEVEN?
 " FIVE " EIGHT?
 " SEVEN " TEN? &c.

Larger than the first by four:

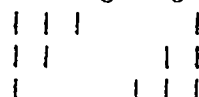
To TWO to form SIX?
 " FOUR " EIGHT?
 " FIVE " NINE?
 " SIX " TEN? &c.

2. THE PRODUCING A NEW NUMBER BY COMBINING TWO OTHER NUMBERS.

EXAMPLES.

To produce the number FOUR in every possible mode:

In the first place, the teacher questions the children in such a manner as to lead them to dispose objects, or to draw lines on the board, according to the following arrangement:



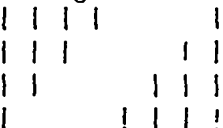
The class, with their attention closely directed to this arrangement, is then to be required to repeat aloud:

"Four lines are formed by
 Three lines and one line.
 Two lines and two lines.
 One line and three lines."

The children should then be required to describe from memory the various modes of producing the number four, after which they may be called upon singly to come forward and construct the number four in every practicable manner, with objects or by lines.

To produce FIVE in the same manner:

Here also the children should first be led to the construction of the lesson with something they can handle, or examine by the eye. In the present case the arrangement will be this



To be read as before. Suppose the construction to be of books:

"Five books are formed by
 " Four books and one book.
 " Three books and two books.
 " Two books and three books.
 " One book and four books."

This to be followed by the repetition from memory: "Four and one are five; three and two are five; two and three are five; one and four are five."

To produce the number SIX on the same plan:

"One and five are six.
 " Two and four are six.
 " Three and three are six.
 " Four and two are six.
 " Five and one are six."

To produce the number SEVEN:

"Six and one are seven.
 " Five and two are seven.
 " Four and three are seven.
 " Three and four are seven.
 " Two and five are seven.
 " One and six are seven."

These lessons should be extended to the number ten, each of them to be followed by a variety of illustrative examples for practice; such, for example, as the following:

I buy a book for eight cents. If I cannot pay for it in one payment, in how many ways can I pay for it in two payments?

A boy has to visit his aunt, who lives at a town nine miles from his home. His mother tells him he may rest for an hour once on the way. If he rest at the fourth milestone, how many miles will he have to walk when he sets off again? How many if he rest at the fifth? At the sixth? At the seventh?

3. THE SIMPLE ADDITION OF THREE OR FOUR NUMBERS, OR MORE.

The use of objects or lines should at first be adhered to in this exercise also, and the children should repeat aloud the given numbers, as well as each successive step of the process. Thus, supposing the numbers given to be two, three, and four, they should say:

"Two and three more are five; five and three more are eight;" or, "Three and three are six; six and four are ten."

When the class has had some practice in this kind of addition, the teacher may slowly pronounce the given numbers, and the class be required to give the final sum only, the intermediate results being omitted.

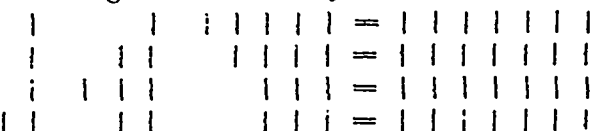
The addition of other numbers is to be carried out on the same plan. The exercises on this head will of necessity be limited, as no result exceeding ten should be attempted; but they may be varied, and many examples given of the same nature as those before introduced.

4. THE PRODUCING A FIXED NUMBER BY COMBINING THREE OTHER NUMBERS.

These exercises are to be illustrated in the same manner as those on the combination of two numbers. Where objects are used, the teacher may put them together as the children audibly perform the addition. Two examples of this exercise may suffice.

To produce the number SEVEN by every possible combination of three numbers:

The arrangement of lines or of objects will be this:



To produce the number TEN:

One and two and seven are ten.
 One " three " six " ten.
 One " four " five " ten.
 Two " three " five " ten.
 Three " three " four " ten.
 Four " four " two " ten.
 Six " two " two " ten.

When the lines have been gone over in this order, it may be useful, without changing the position of the strokes on the board, to calculate each line backward, reading the top line of the second table, for instance, thus: "Seven and two and one are ten," &c.

The producing a number by the combination of four numbers, will suggest itself to the teacher, as a simple extension of the method recommended above.

Each separate exercise should be illustrated by examples having an application to visible objects and the events of every-day life.

PHENOMENA OF A TOTAL SOLAR ECLIPSE.

BY C. PRITCHARD, F. R. S., HULSEAN LECTURER IN THE UNIVERSITY OF CAMBRIDGE, ENG.

FIRST PAPER.

"CERTAINLY this surpasses Niagara." "When will it occur again? I would go to the world's-end to see it once more." These were the first greetings of two friends who met within half an hour after the termination of the great total eclipse of the sun which they had just witnessed in July, 1860, from two neighbouring stations on the Spanish Pyrennees. There are perhaps very few who have not seen, and that without astonishment, what they believe to have been an eclipse of the sun. An eclipse, that is to say, a partial eclipse of the sun, no doubt most persons have seen, yet the phenomena did not strike them as remarkable; there was a little gloom, and a slight sensation of coldness in the air, and there were unusual forms in the shadows of things, and—this was all. But a total eclipse of the sun has probably not been seen, nor ever will be seen, by as many as twenty out of all our readers. Nevertheless, if we shall succeed in conveying an adequate impression of the

phenomena which occur during what is termed *the totality*, there will be but few who would be unwilling, if it were possible, to take a journey even to the antipodes to witness a succession of physical appearances, which for strangeness, suddenness, awfulness, and majestic beauty, surpass, as our friend not unreasonably said, even the stupendous scenes of Niagara.

The truth is, that only five or six total eclipses are recorded to have been observed within the limits of Europe during the last century, and of these two only have been described with a completeness and intelligence worthy of the beauty and importance of the phenomena disclosed. Since 1715 not one has been visible in the neighbourhood of London. But, independently of the rareness of their occurrence, there is a combination of briefness of duration with rapidity of succession in the phenomena themselves almost overwhelming; less than eight minutes being the extreme limit of their visibility; indeed, what we shall endeavour to describe transpired in somewhat less than half of that time. And then it is necessary beforehand to have a clear conception of what to expect and what to look for; and, lastly, for the minuter and less grand, but not less interesting phenomena, there is that education of the eye which is just as necessary for the observation of physical facts as it is for the due appreciation of works of art and of æsthetic beauty.

Without entering upon any deeply scientific considerations, the reader, by the exercise of a little ordinary thought, may readily understand most of the reasons why total eclipses of the sun are of necessity very rare in any specified locality even of considerable extent. First of all, it is necessary for him to bear in mind that, owing to the relative dimensions and distances of the orbs themselves, the sun and the full moon appear to a spectator on the earth's surface, sometimes exactly, and at all times nearly, of the same size. The distance of the moon from the earth varies considerably, that of the sun varies relatively very much less; consequently, while the sun retains, to an unscientific spectator, sensibly the same diameter, the apparent size of the moon perceptibly changes. The amount of this variation is such, that the diameter of the moon, when farthest from us, appears to be about nine-tenths of the apparent size when it is nearest. We here and elsewhere purposely speak without astronomical exactness, in order not to confuse the reader with numerical details, which would leave no precise impression upon his mind.

From this cause, then, namely, the varying distance of the moon from the earth, it follows that if the centres of the sun and moon at any time came together into the line of a spectator's sight, the moon might either *exactly fit* the sun, or it might more or less overlap the sun, or it might leave a bright little ring of the sun uncovered. In the two former cases there would, to the spectator, be a total, and in the latter case, an annular, eclipse of the sun. But then it happens very rarely indeed that the centres of the sun and the moon can come together exactly into the line of sight at any one place on the earth's surface; and even if they did, the moon is so comparatively near to us, and the apparent *fitting* of the sun by the moon is in general so nearly exact, that if the observer were to move a few miles from his post, it might easily happen that he would get a peep of some little portion of the bright sun *sideways* behind the moon; and to *him* the totality of the eclipse, and with that all the wonders of the eclipse, would then be destroyed. In the course of our remarks we shall have occasion to describe how we ourselves, while involved in the darkness of a *totality*, could and did plainly see a succession of places at the distance of a few miles from us still accessible to a partial shining of the sun's rays. These considerations, from astronomical grounds, may perhaps be sufficient for the general reader to understand the main reason of the infrequency, of a total solar eclipse, and also why, when such a phenomenon does occur, it will be *total* over but a comparatively small portion of the earth's surface.

It is essential also for him to bear in mind, that so long as perhaps even a thousandth part of the sun's disc remains uncovered, the main and the salient features of a total solar eclipse cannot be disclosed. Indeed, it is not many years since nine hundred and ninety-seven parts out of a thousand of the sun's face were eclipsed to the inhabitants of the central parts of England, and yet even in the very few favoured spots where unfriendly clouds did not interpose to prevent all observation, no phenomena of any great interest were discernible. Hundreds upon hundreds of spectators flocked from all quarters to localities which were pronounced favourable for the sight, but an experienced *habitué* (if there be such) would probably have stayed at his own home.

The circumstance which in recent times gave the first impulse to the more careful observation of the phenomena of a solar eclipse occurred about thirty years ago, and was as follows. The late Mr. Francis Baily, then President of the Royal Astronomical Society, and to whom the cultivation of astronomical science by amateurs in England is so permanently and deeply indebted, was induced to take a journey to Jedburgh, in the south of Scotland, from the neighbourhood of which town it was calculated that an *annular* eclipse of the sun would be visible on May 15, 1836. In those days Astronomers Royal and Superintendents of the Nautical Almanack did not impose upon themselves, as they do now, the duty of furnishing the scientific world with accurate, elaborate, and discreet accounts of the paths and all other circumstances of solar eclipses, and Mr. Baily seems to have been left to complete much of the necessary work for himself. He took with him to Jedburgh a telescope of considerable dimensions for those days of inferior

glass, constructed by Dollond, and we may therefore presume it to have been excellent of its kind—for such a man as Baily was worthy of the best efforts of even such an artist as Dollond. We make this remark because, from the peculiarity of the observations made by Mr. Baily with this telescope, the accurate performance of the instrument has been, as we think on no sufficient grounds, called into question in some high quarters.

On this occasion Mr. Baily had observed a phenomenon which it seems, up to that day, had not been seen, and since that day has rarely been observed, exactly in the manner, and up to the measure, of the way in which that astronomer had described it. Those who are curious in such things will find the original and most interesting account, with many details, in one of the volumes of the Transactions of the Astronomical Society. Mr. Baily says, "I saw a row of lucid points, like a row of bright beads, irregular in size, and distant from each other, suddenly formed round that part of the circumference of the moon which was about to enter, or had just entered on the sun's disc." That is, these bead-like appearances were formed just before the entire body of the moon intercepted the greater part of the sun's light, and just as the *annularity* of the eclipse was on the point of being completed. The formation of these luminous beads, Mr. Baily goes on to say, "was rapid, like as if caused by the ignition of a fine train of gunpowder, as the moon pursued her course over the sun's disc. The dark intervening spaces were sketched out into long, black, thick parallel lines joining the limbs of the sun and moon, when all at once they suddenly gave way," and the beads disappeared. The whole phenomenon occupied about six or eight seconds.

There can be no doubt that the singularity and unexpectedness of this phenomenon excited considerable impatience in the minds of astronomers to observe so remarkable an effect, though, at the same time, some doubt was thrown upon the performance of the telescope employed. The reader probably is aware that the surface of the moon is, in many parts of it, thickly studded with groups and ranges of lofty volcanic hills, the appearance of which very closely resembles that of Vesuvius or of the Campi Phlegrei in the neighbourhood of Naples, or the long line of extinct volcanoes in Auvergne, and on the southern side of the Cevennes in France. A picture of the one would give a not inadequate conception of the other. This then being the case with the moon, it is by no means an uncommon thing to see her black contour in her stately and half-mysterious march across the bright face of the sun, somewhat irregular and jagged, but, although the configuration of the moon's surface is now perhaps better known than that of the interior of Africa, we believe that no range of lofty hills exists on our satellite such as could produce the phenomena of the bright beads, as described by Mr. Baily. However, be these beads what they may, and however caused, it is quite certain that this fortunate observation excited the attention of astronomers to the more careful scrutiny of solar eclipses in future. We shall only add, that on the occasion of this annular eclipse at Jedburgh the light which emanated from the thin, thread-like, luminous, unclipped ring of the sun was quite sufficient to obliterate, or prevent all those grand, and it may be said, almost terrible phenomena which in due course we shall have occasion to describe as accompanying an eclipse in its *totality*. Mr. Baily remarks that the light resembled that which is seen when the sun shines through a morning mist, the annularity lasting for nearly four minutes and a half. The thermometer fell three or four degrees. Two minutes before the annulus was formed Venus became visible. Gunpowder could not be fired when the heat from the unclipped annulus was concentrated upon it by a burning lens of three inches in diameter. Notwithstanding the partial gloom, the birds continued in full song, and a cock persisted to crow with all its might. Very different, as we shall see, were the effects at our station at Gnjuli in 1860.

Six years elapsed before an opportunity presented itself to European astronomers for the re-examination of the strange appearances observed by Mr. Baily, and this was afforded by the occurrence of a solar eclipse visible throughout the north of Italy and over a portion of Germany. On this occasion it was fortunately not annular, but total. Mr. Baily posted himself at Pavia, and the present Astronomer Royal, Mr. Airy, selected for his place of observation the summit of the well-known Superga in the neighbourhood of Turin. This eclipse occurred on the 8th July, 1842.

Mr. Baily took with him the same instrument which had disclosed to him the *beads* at Jedburgh. Again he saw the same phenomenon, just at the moment when the black moon was on the point of extinguishing the light of the bright sun. The sun *went out*, as it were, not as an exquisitely thin and beautiful crescent, but in the form of a few brilliant, detached, luminous beads; on this occasion, however, the interstitial black lines, which at Jedburgh had united the closely contiguous edges of the sun and moon, did not appear.

Warned by his own experience, and by the record how a century before, and on an occasion similar to the present, Roger Cotes, the friend of Newton, had complained of being "oppressed by overmuch company,"* Mr. Baily had requested to be left alone in one of the rooms of the University of Pavia. To his infinite astonishment, while watching the disappearance of the beads, he found his voluntary solitude broken by a tremendous burst of applause proceeding from the streets below, and, on taking his eye for a moment away from the telescope, he was himself "electrified

* See Philosophical Transactions for 1715.

by one of the most brilliant and splendid phenomenon that can be imagined." He had expected to see round the dark moon, which now completely concealed the sun, nothing beyond something analogous to what he had seen at Jedburgh in 1836, viz., a narrow, circular band or riband of light, of no great brilliancy or extent. But he had not sufficiently estimated the effect of the still remaining light which emanated from the narrow, luminous ring of the annular eclipse at Jedburgh, in obliterating phenomena which, but for this residuary light, might have displayed themselves with far greater intensity. The unexpected phenomenon which had excited the applause in the streets of Pavia, and which the more calm astronomer confesses electrified himself in his solitude above, was nothing less than the sudden outburst of a *crown of light* surrounding the dark orb of the moon. Its breadth extended fully to that of one-half of the moon's diameter; the colour of the light was neither pearly, nor yellow, nor red, but of a pure white, and seemed divided into rays. In some respects it seemed inimitable by any artificial contrivance, but it bore some resemblance to the "Aurcole" or "Glory," which in pictures is placed round the heads of the saints. We can fully appreciate the expression of Mr. Baily's surprise, that so obvious, sudden, and magnificent a phenomenon had not been adequately described in any previous account of a total solar eclipse.

But this sudden outburst of a luminous corona round the dark orb of the moon was not the only unexpected phenomenon which the astronomer saw, or at all events now noticed, for the first time.† From the dark body of the moon, or it might be from the now obscure photosphere of the sun behind it, there darted forth into the corona three luminous protuberances, or tongues, as it were, of coloured flame; their colour was red, tinged with purple, or peach blossom, or perhaps more nearly resembling that celestial tint which sometimes reposes impatiently upon the snowy tops of the Alps at sunset.

These mysterious tongues of coloured flame extended into the corona through a space estimated at about one-twentieth of the moon's diameter; hence, if they belong to the sun they must have had one dimension of at least from thirty to fifty thousand miles! If they belong to the moon this magnitude would be reduced to perhaps eighty, or it may be, a hundred miles; we speak purposely in a loose approximation. We shall see in the sequel that modern astronomy has settled *where* they are, but not *what* they are. yet we are not without a reasonable hope that through observations made during a total eclipse, which will occur in less than thirteen months hence, perseverance, and science in her rapid progress, will disclose to us something definite regarding the natural history of even those unearthly fires so mystic and so remote. But of this also we shall speak much more definitely in the sequel. At present we shall only add that the light from the corona was sufficiently intense to render a candle, which Mr. Baily had lighted for the purpose of reading his chronometer, unnecessary. And now for how long does the reader imagine was the continuance of these wonderful revelations? In the brief space of two minutes and a half, they had come and they had gone; suddenly they came, and as suddenly they vanished—vanished from the sight "like an exhalation," or a vision in a dream—but not from memory.

While Mr. Baily was thus engaged in making these observations at his room in the University of Pavia, the present Astronomer Royal, Professor Airy, was similarly occupied on the summit of the Superga. The Superga is the culminating point of an insulated knot of hills, rising some 800 feet above the valley of the Po, situated about five miles from Turin, and commanding a most lovely and extensive view over the plains of Piedmont. Mr. Airy appears to have selected it among other reasons, under the hope that he might catch a glimpse of the rapid *flight of the shadow of the eclipse* over a widely extended and visible track of country. In this he was disappointed, for the day was gloomy, and it requires a bright and unclouded sky to see the mighty rush of that unearthly shadow spreading from height to height, or sweeping over the level fields, at the rate of some thirty miles per minute, up to the very feet of the observer, and then wrapping him and all things round him in a sudden and startling gloom.

Upon the Superga were many spectators; but the Professor—thanks to the good feeling of his neighbours—was not like his great predecessor, Cotes, at Cambridge, "oppressed with overmuch company." At Mr. Airy's station, the darkness both before and during the totality seemed to have considerably exceeded that experienced by Mr. Baily at Pavia, indeed the amount of darkness during an eclipse appears to be modified to a great extent by the meteorological circumstances of the atmosphere at the time. About two minutes before the commencement of the totality, the candle which stood lighted at Mr. Airy's side seemed to burn with an unnatural brilliancy. "A large cloud over our heads, whose appearance had not been particularly remarked, became, if possible, blacker than pitch, and seemed to be descending rapidly, its aspect became terribly menacing, and I could almost imagine it appeared animated." such is the description given in Mr. Airy's own words. He adds,—"Of all the appearances during the eclipse,

there was none which has dwelt more powerfully upon my imagination than the sight of that terrible cloud."*

Mr. Airy saw nothing whatever of the "beads," though, at Pavia, Mr. Baily, as we have seen, had observed them the second time; but then it must be borne in mind that in the neighbourhood of the Superga the sky was clouded; so much so, that at Turin, only five miles away, Professor Plana lost the available sight of totality altogether, and, strange to say, owing mainly to that very cloud, of which the Astronomer-Royal has given so graphic a description. Mr. Airy observed the same three coloured protuberances already described, but although the "corona" was very distinctly visible, still, on account, probably, of the murkiness of the atmosphere round the sun, it contracted its visible breadth into about one-eighth of the diameter of the moon. We ought, however, to add, that the three coloured protuberances, or flames, were distinctly visible to the unassisted eye of Mr. Airy's companion, *after his attention had been formally called to their existence.* The darkness was so considerable, that the indications of the chronometer could be read only with great difficulty.

Akin to the appearance of the proximity of the dark cloud overhead, was the remarkable aspect of the black moon in front of the corona. It seemed to hang, as it were, in mid-air, and even to approach the eye of the spectator within a few hundred yards? To this remarkable phenomenon we shall have to refer again, in our description of what occurred at Gajuli. Before, however, we conclude our account of Mr. Airy's observations, it may be well to add, that the same sort of tumultuous applause which occurred with Mr. Baily at Pavia, was repeated also on the Superga. As soon as the sun was completely hidden, there commenced among the spectators at the hill, first a low murmur, and then a loud expression of general delight.

Such are the phenomena observed by these two experienced and distinguished astronomers. In due time the reader will have an opportunity of comparing them with what was observed in Spain during the most unexceptionable circumstances of the totality of 1860, and so far we apprehend that the terms in which we have spoken of the awful and majestic character of the appearance disclosed in a Total Solar Eclipse have not been exaggerated or over-charged.

Upon the return of the Astronomer Royal and Mr. Baily to London, it was natural that a very lively interest should be excited among men of science, and indeed among intelligent persons in general, by the remarkable, not to say striking nature of the phenomena which they had described. The re-observation of the bead-like appearance by Mr. Baily, their non-observation by the Astronomer Royal, the unexpected dimensions and brightness of the corona, and beyond all, the record of the coloured flames or prominences, became the subject of animated discussion among learned men. Notwithstanding the philosophy of Comte, at that time coming into fashion, that men act wisely and usefully when they confine their attention solely to what they see, and how and when they see it, it came from an irrepressible impulse of the mind, setting at nought and confuting this hard philosophy, that intelligent men began, and could not help beginning, to speculate earnestly and widely upon the causes of these strange and newly observed phenomena. Does the beautiful light of the corona arise from the reflection of the sun's light by a transparent atmosphere surrounding the sun's photosphere? If so, how enormous must be its extent, seeing the light has been traced to a distance from the sun exceeding the half of its own diameter! And then, what are these mysterious coloured prominence like tongues of fire? Are they really flames? Are they solid? Are they enormous masses of solar cloud floating in the lower portions of a solar atmosphere, and illuminated and coloured like terrestrial clouds at sunset? Or is it possible that they are appendages of the moon? And lastly, what are these luminous bead-like entities into which the last thread of solar light breaks up, just when the black moon is completing its obscuration of the sun? Are they the strugglings of the last of the sun's rays through interstices between some line of lunar mountains on the moon's edge? Are they entities at all, or is it possible that the telescope is at fault? These and other like questions formed, for many months, the staple of discussion not alone among astronomers, but they deeply interested other intelligent men who took pleasure in advancing or in watching the advance of physical knowledge.

With such knowledge as philosophers possessed in 1842, it was not then possible to give a definite and certain reply to many, or perhaps even to any of these questions; but then the discussion of them served to indicate the proper form of future observations; and as competent men quietly mused upon the strange sights which had been seen in Italy and at Jedburgh, the practical questions and cross-questions which it would probably be most advantageous to put to the sun and to the moon, on the occasion of the next total eclipse, began gradually to take a philosophical and definite form. And not only so, but there arose also another collateral advantage: the minds of practical observers became more intently set upon scrutinizing the body of the un eclipsed sun itself, the ultimate result in our day being an accession to our knowledge far beyond what in 1842 entered into the conceptions or the hopes of men. And should the reader desire to know what these accessions to our physical knowledge are, he will find many of them detailed lucidly

* Transactions of the Astronomical Society. 1842.

† In Motte's Abridgment of the Philosophical Transactions, vol. i., page 268, the curious reader may find that Captain Stannyanu, at Berne, in 1706, observed "a blood-red streak of light, in the corona, and that Halley anticipated the observation of something like "Baily's beads" in the next total eclipse of 1715. See pages 272, 273, of Motte's Abridgment.

and beautifully in Sir John Herschell's delightful volume, "Familiar Lectures on Scientific Subjects."

It soon became known that on July 28, 1851—nine years, that is, after the Italian observations—there would be a total eclipse of the sun, visible throughout a considerable extent of Europe; and, short as its duration must necessarily be, nevertheless lasting for a time sufficient for skilful observations. Maps of the path of the shadow of the moon were prepared, and a long and carefully adjusted string of questions was printed by order of the British Association, from which amateur observers and others would find abundant information and instruction how to proceed, and what phenomena were worthy of especial note. Sweden was fixed upon as containing the most accessible and advantageous localities for carrying on the observation, and various parties were organized, comprising many of the ablest and most experienced of English observers. Among them we may mention the following names in alphabetical order:—Messrs. Adams, Airy, Carrington, Dawes, Hind, Lassell, Robinson of Armagh, and Piazzi Smyth, an array of astronomical names more than sufficient to inspire all necessary confidence. To these we may properly add the well-known names of Mr. H. Fox Talbot, and of Mr., now Professor Living, whose philosophical pursuits were directed rather toward physical than astronomical science.

The Astronomer Royal on this occasion was accompanied by two assistants, Mr. Dunkin of the Royal Observatory, and Mr. Humphreys. In order that the circumstances of the eclipse might be seen as much as possible under different points of view, Mr. Airy remained himself near the path of the centre of the moon's shadow, at Gottenberg; while his two coadjutors were despatched nearly to the two extreme edges of the shadow. Another reason for the separation was the advisability of making some preparation against the contingency of bad weather in any one locality.

As the dark moon advanced over the face of the sun. Mr. Airy, who was provided with a telescope of $3\frac{1}{2}$ inches aperture, observed that the outline of the moon's disc was extremely jagged by mountainous elevations, and yet he says, "I saw the moon's serrated limb advance up to the sun's, and saw the light of the sun glimmering through the hollow between the mountain peaks, and saw those glimmering spots extinguished one after another in extremely rapid succession, but without any of the appearances which Mr. Baily has described.

With regard to the amount of darkness during the totality, Mr. Airy's account is that the chronometer face could not be read without the immediate proximity of a lantern; that a friend of his had great difficulty in finding the way to descend from an adjoining rock, and that he found it no easy matter to write the smallest memorandum even with the aid of his lantern. Moreover, in order to avoid confusion and loss of time, when the time is so short, he recommends all future observers to provide themselves with no fewer than three lights.

With reference to the corona, it was far broader than that seen in 1842 from the Superga. In the present instance it was little less broad than the moon's diameter! It was beamy and radiated in structure, and terminated, though very indefinitely, in a way somewhat after the fashion of the ornament frequently placed round a mariner's compass.

Of coloured prominences there were several; one of them resembled a *bonerany* distinctly visible to the naked eye, and its height from the sun's photosphere (if in reality it belonged to the sun) could not have been less than seventy thousand miles. But what was more remarkable still, and what seems to indicate the cloudy nature of its substance, there was visible a red detached cloud, or balloon, of nearly circular form, separated from the moon's limb by a space of nearly its own breadth. In fact, this detached prominence must have been something floating in some atmosphere.

With respect to the visibility of the rushing motion of the moon's shadow across the country, he says that at the moment of the first re-appearance of the light of the sun "the country seemed rapidly, though half unwillingly, to be recovering its usual cheerfulness. My eye, however, was caught by a duskiness in the south-east, and, I immediately perceived that it was the eclipse shadow in the air, travelling away in the direction of the shadow's path.* For at least six seconds this [moving] shadow remained in sight, far more conspicuous to the eye than I had anticipated. I was once caught in a very violent hail and thunder storm on the table land of the county of Sutherland called the Moin, and I at length saw the storm travelling away over the North Sea, and this view of the receding eclipse shadow, though by no means so dark, reminded me strongly of the receding storm. In ten or twelve seconds all appearance of the shadow had passed away."

Some cries of the birds were recognized by persons skilled in their habits, as being of the evening note before the totality, and the morning note as soon as the sun re-appeared. Mercury and several stars were visible.

It is a circumstance both curious and noteworthy that Mr. Dunkin, who was observing near the edge of the moon's shadow, and in unfavorable atmospheric circumstances, saw the moon's edge advance over the sun without any serrated marks indicative of mountains, and yet the phenomena of "Baily's beads" were observed

by him in all their brilliance. He says, "The only thing I can compare them with is a necklace of diamonds."

There is one description of the motion of the shadow of the moon over the country, given by Captain Biddulph, R.A., which will probably be read with much pleasure, and with it we shall conclude for the present all further reference to this exciting phenomenon. "A gap in the clouds became first a blue purple and almost black, rapidly the furthest distant clouds reflected light no longer, the shadow commencing at the horizon and spreading itself upwards. The whole north-west sky for 30° became of the deepest purple, more intense than any thunder-cloud I ever saw. A light cloud on which my eye had been set I saw distinctly put out like a candle, and the red roof of a house which had heretofore been conspicuous before me was gone, and the horizon was no longer visible. The rapidity of the motion of the shadow, and its intense-ness produced a feeling that something material was sweeping over the earth at a speed perfectly frightful. I involuntarily listened for the rushing noise of a mighty wind. It was a sight more grand than those who have not seen it can possibly conceive. I could, now that we were in the middle of the totality, distinctly observe that we were on the north side of the central line of the shadow; to the south it was dark and black, while to the north-east it was yet light, that is to say, the horizon in that direction was yet visible. I watched the shadow spread away to the south-east. The coming light showed itself first close to the horizon on the north-west, and the mountains were visible—and soon, far too soon—cloud after cloud, and distance after distance, was rapidly lighted up. The sun's bright limb showed itself, and the shadow, like a huge dark vapour, had passed over and soon disappeared below the south-east horizon."

Before we dismiss the account of this eclipse as observed in Sweden by British astronomers, it is important to notice the record of an observation made by Mr., now Professor, Adams, of Cambridge, and at that time President of the Royal Astronomical Society. This eminent physical astronomer noticed certain circumstances in the behaviour of one of the rose-coloured prominences which go far towards the determination of the question whether these strange-coloured lights belong to the sun or to the moon. Let the reader imagine himself looking at the sun between three and four o'clock, in the south-western portion of the heavens, and that the moon which first struck it on the right hand, about midway between the upper and lower parts of his disc, advancing from right to left, has just covered his entire face. The totality of the eclipse has just commenced. Just when the moon first struck the sun on the right hand, Mr. Adams observed a small rose-coloured prominence. After watching it for a short time he observed that its altitude was gradually increasing, and his attention in consequence became entirely engrossed by it. This increase of length or altitude continued until the moment of the re-appearance of the sun's light on the right hand, at which moment the prominence projected from the now coincident limbs of the sun and moon three times as much as when it was first observed. In about a second more the whole vanished. Now the reader can scarcely fail to see that this is just what must occur if the rosy prominence was attached to the sun. For at the commencement of the totality, the moon would considerably overlap the sun on the west, or the right hand, thus concealing the part of the prominence which was nearest to the sun, and then as the moon advanced to the left, or the east, it would uncover more and more of it, thus increasing its apparent altitude or length until the moment when the root of the prominence and the sun itself began to be disclosed; then all would soon be obliterated by the excess of light.

It cannot be said that the observations of this eclipse of 1851 brought any large accessions to our positive knowledge either in a physical or an astronomical point of view; nevertheless, the experience gained even from imperfect results was at the time considered to be, and was ultimately proved to be, of the utmost importance in guiding future proceedings on similar occasions. For instance, the want of absolute measures made at the time, left Mr. Adams in some doubt as to whether the increase of the height of the coloured prominence mentioned in the last paragraph was precisely such as was due to the rate moon's motion over the sun's disc, and consequently there remained the same amount of doubt as to the certainty of the locality of the prominence itself. Here, then, was an indication of the necessity of contriving some means for exact measurements on a future occasion. Again, Mr. Fox Talbot, who observed this eclipse in Germany, threw out a suggestion that the origin of these rose-coloured flames, as possibly they might eventually be shown to be, was to be sought in some inflammable vapours proceeding from spots in the sun, as they are conventionally called, but which spots are in fact certain funnel-shaped holes or rents in the solar photosphere itself. This remark indicated the necessity of a careful scrutiny of the sun's body before and after the eclipse. Lastly, a daguerrotype of the eclipse was taken by Dr. Busch at Königsberg, which, imperfect as it was, held out the promise that records from the unimpassioned autographs of the sun itself might be more leisurely and calmly examined, than any instrumental observations of the phenomena themselves made by the human eye at a time when the mind of the observer could scarcely fail to be prejudiced, or excited and off its balance.

Again the charmed cycle of about nine years was fast passing away, and the attention of astronomers was drawn to another total eclipse, visible on the 18th of July, 1860, not in Italy as in 1842,

* The direction of the passage of the moon's shadow was from N W to S E.

nor in Norway, as in 1851, but on this occasion embracing for a longer or shorter duration almost the entire north of Spain. Under the auspices of the Astronomer Royal an expedition was in due time organized, comprising a considerable number both of amateur and professional observers. After the experience gained on the two former occasions it was reasonable to hope that the locality of the rose-coloured prominences would at length be finally established, and that some better information would be obtained relative to the origin of the beautiful radiations of the corona. With this view certain improvements were introduced into the form of the micrometer or measuring instrument, and in particular a happy suggestion of Sir John Herschell's was adopted, whereby the sun's disc could be observed without the necessity of contracting, as heretofore had been necessary, the aperture of the telescope. Beyond all, great advances had been made in the art of photography as applied to autographic pictures of celestial objects, and especially in this country by Mr. Warren de la Rue, who by a rare combination of chemical, mechanical, and astronomical skill, had obtained photographic picture of the sun and the moon, possessing not only unrivalled beauty, but what was of more consequence, an amount of accuracy which would bear comparison with results obtained by the most refined instrumental measurements. It was in fact proposed to attempt to photograph the corona and its appendages during the totality itself.

At the instance of Mr. Airy, the Admiralty of that day devoted their noble troop-ship the *Himalaya* to the purposes of the expedition. Nothing was omitted which was deemed likely to conduce to the successful prosecution of the observations required. A code of instructions was drawn up, maps of the path of the moon's shadow were engraved on a large scale, and all the anticipated circumstances of the eclipse were described with a copious and precise detail. Among other arrangements Mr. Hind, the superintendent of the Nautical Almanack, furnished a pictorial chart of the positions, in relation to the sun, of such planets and stars as it was presumed would become visible during the obscuration of the eclipse. The main object of the construction of this chart was to afford the means of detecting certain intra-Mercurial planets, the existence of which had been suggested by M. Leverrier, and especially a planet "*Vulcan*," which that eminent astronomer maintained had been observed in its transit over the sun's disc by M. Lescaubault.

Beyond all other circumstances which promised favourably for the successful observation of this eclipse was the existence of a railway, in process of construction from Bilbao to Tudela, across the shadow of the eclipse. It was rightly considered that such works in a country where roads were few, and accommodation and means of transit scarce, would prove a circumstance of the utmost importance; indeed but for the existence of this railway, and beyond all, but for the untiring zeal and unbounded liberality and intelligence of the engineer, E. Vignolles, Esq., F. R. S., the whole expedition must have been thrown into almost inextricable difficulties.

THE DAY FORTY-EIGHT HOURS LONG.

THE subject involved in the following explanation has often been a puzzle to school-masters:

"Last week showed that the first beginning of the day is somewhere between America and Asia. The precise locality of that somewhere has not been determined. If the Pacific ocean were thickly populated with men, the place of the beginning of the day would be a matter of great consequence, and would probably be settled by statute. The day would start from a meridian line extending from pole to pole, and the longitude of this day line would be so accurately fixed that a man might stand astride it and realize the paradox of having one foot in Monday and the other in Tuesday. Many of the readers of this will live long enough to hear this subject discussed in national councils.

"We propose now to show that Monday or any other week day is forty-eight hours long; we mean that during the whole of forty-eight hours, Monday is on the earth somewhere to be found. The Monday of this city is of course twenty-four hours long, but before and after our Monday there is Monday in some other quarter. When Monday begins in New York, there have been three hours of Monday in London, and for three hours after our Monday ends there will be Monday in San Francisco. Thus between these places Monday lasts thirty hours. Now if the day line were at our antipodes, Monday would begin there twelve hours before ours, and end twelve hours after ours. Thus, for the space of forty-eight hours the earth is not rid of Monday. The fact may be illustrated in another way. Suppose we are at the day line. Monday begins there, and in twenty four hours along comes Tuesday. But just west (half an inch if you please) Monday began only an instant before it ended east of the line. The Monday east of the line is twenty-four hours long, and west of the line is the same length, and in all Monday lasts forty-eight hours."—*Scientific American*.

EDUCATIONAL INTELLIGENCE.

AT HOME.

Colchester Co.—H. C. Upham, Esq., Inspector, writes as follows:—"During the month of August I visited the schools in the following sections: Cumberland Road South, Clarkville, Brookfield, Lower Stewiacke West, Fort Ellis, Gay's River, Upper Gay's River, St. Andrew's, Folly, DeBert River, No. 1, DeBert River, No. 2, DeBert, Chigonois, Upper Chigonois, North Mountain, Bass River, Central Economy, Upper Economy, Pleasant Hills and Highland Village. I abstained from visiting schools nearly two weeks, hoping that the vacations would have passed, yet missed seeing the schools in Shubencadie East, Folly Mountain, Lower Economy and East River, when in the neighborhood, on this account. Some schools had their vacations in June, and there has not been a week since when some school has not been vacant, and this is likely to continue until the potatoes are harvested. A general feature of the month's inspection is smallness of attendance, arising from various causes, but most particularly from the abundant crops of this year, and from the prevalence of whooping cough and mumps in many places.

A new school-house is building at Lower Stewiacke (East section) in place of that which was burned last winter. The new houses in Chigonois are now occupied by respectable schools. It is to be hoped that this section may never again fall into the low state in which it has been for many years past. The new and good school-house in Highland Village is now completed.

I beg to call your attention to an error in defining the word "definitely" in the 5th reading book *N. S. Series*, p. 118.

Kings Co.—Wm. Eaton Esq., Inspector, reports as follows:—"I am glad to be able to report, that as the work of inspection proceeds, new tokens of advance present themselves. I find that in addition to those before reported, three new school houses are in progress, and will be open at the commencement of the coming term. Two more, the frames of which were erected last year, and covered in, will I hope be finished soon. The acknowledged scarcity of money has prevented more being done.

The great desideratum, in order that the present school law work out for the Province all those benefits which it is designed to effect, is an adequate staff of teachers, possessing ability, and proper training. These are not however the only requisites to successful teaching; unless there is brought to the discharge of the duties of the school room, a good degree of enthusiasm; unless real spirit and energy, and originality of thought, as well as tact characterize the individual who takes upon himself the business of instruction, failure in some measure will result. I have no doubt but the teachers of Kings, will in these respects compare favorably with those engaged in other counties, for we have some thorough good teachers; but occasionally as I visit the School-room, my heart is pained, and sick at the dullness that is apparent in all the exercises. The character and feelings of the teacher, an impressed invariably upon the children, so that we cannot help reiterating the saying, "As is the teacher, so is the school."

Let the teacher be of the right stamp, and value his services proportionately; not engaging with Trustees for a mere pittance, as I regret to say has been the case in several instances in the present term—so will he be respected, and the profession be raised to its proper position. The number registered in the schools is generally very satisfactory, although in some cases the average attendance falls considerably below what we might naturally expect. This however is owing chiefly to the demand made upon the child's services at home, from the scarcity of labor.

A greater difference between the number registered, and the average attendance should be expected under the present law, than under that which it superseded.

It is a significant fact, as indicative of public feeling, in reference to the present enactment, that neither of the candidates for the coming election presumes in his canvass, to touch the school law, unless in some of its minor details."

Lunenburg Co.—The Inspector reports that during his official visitations this term he has instituted careful enquiries respecting teachers' agreements, and the disposal of school books supplied through the Educational Department. In reference to these matters he says, "In no instance, so far as I have been able to learn, have the official regulations been disregarded or departed from in any particular." East Chester, which has been without any school-house for years past, has erected an excellent and commodious house. It will be ready for occupancy by November. At Bridgewater both departments of the school are working well; but the elementary department is too much crowded. An additional apartment is greatly needed, and until it is had the school cannot give complete satisfaction. Upper Northfield is engaged in completing a new school house, well proportioned, and of ample size for the requirements of the section. The people in this section are very poor, but they have put forth unusual efforts to bring the most approved means of education within the reach of their children.—Garden Lots (No. 4) has a new and very neat school house, entirely finished; but it is yet deficient in furniture and apparatus.

COUNTY FUND

In aid of Public Schools, appropriated to Trustees of School Sections, for the Term ended 30th April, 1897.

[Concluded.]

COUNTY OF CUMBERLAND.

NAME.	No. of Pupils Registered.	Amount paid to Trust. of Sect'n from Co. Fund.
Stake Road,	55	\$29.95
Clam Bay,	60	46.52
Goose River,	58	39.22
Wallace Harbour,	87	51.08
Six Mile Road,	71	58.75
Wallace River, [11]	90	70.40
Wentworth [12]	49	40.33
Wentworth, [13]	46	26.87
Wallace River, [14]	47	24.45
Fox Harbour,	57	32.87
Gulf Shore,	32	23.26
Pugwash,	253	185.78
Wallace Bay, [20]	45	28.03
Wallace Bay, [21]	37	29.47
Dougherty Creek,	29	17.44
Pugwash River (East),	53	29.18
" (West),	71	67.29
Roslin,	57	35.82
Gray's Road,	61	33.71
Victoria,	48	30.61
Crawford,	54	32.33
Goose River, [32]	47	41.46
Shinemicas, [33]	39	22.87
Shinemicas, [34]	43	23.75
Shinemicas, [35]	37	28.75
Tignish Corner,	62	44.57
Head of Amherst, [37]	55	29.62
Head of Amherst, [38]	40	33.11
Amherst,	273	234.50
Fort Lawrence,	48	43.41
Amherst Point,	53	45.31
Lower O'Brien,	60	29.08
Coates' Hill,	72	55.36
Lower Maccan,	62	41.14
River Hebert,	80	56.31
Barrowsfield,	29	24.36
Little River, (Joggins Shore,)	52	25.74
Minudie,	61	41.14
Joggin Mines,	73	41.61
Jackson,	44	30.92
Rockwell,	52	28.64
Head of River Hebert,	16	18.53
Little Forks of Maccan,	31	19.16
Maccan Intervale,	29	20.95
West Brook,	44	26.61
Claremont and Salt Springs,	37	20.09
Limekilns,]	43	35.03
Salem,	38	22.50
Fenwick,	67	40.38
Leicester,	54	40.97
Little River,	42	29.26
Mount Pleasant,	45	27.00
River Phillip,	65	40.91
Town Hall, River Phillip,	60	39.70
Westchester,	57	51.60
Chignecto Mines,	51	33.16
*South Shore Malagash,	52	39.66
*Dewar's River,	41	31.69
*Tony Bay	39	22.63
*Ragged Reef,	58	16.29
*Maccan Mountain,	28	18.21
*Maccan Mountain Road,	22	13.84
*Farmington,	44	32.03
*West Branch Wallace River,	49	30.90
Mill Village,	158	\$115.26
Diligent River,	61	31.81
Port Greville,	74	39.82
Brookville,	32	19.73
Apple River,	36	22.95
Halfway River,	16	10.99
New Canaan,	36	28.35
*Black Rock,	42	48.30
*Patterson's Shore,	17	19.20
Arrears from last term.	4125	\$2,961 57
		49.88
	4125	\$3,011.45

Provincial Grants to Public Schools.

[Concluded.]

IN AID OF SUPERIOR SCHOOLS.

County.	No. Schools competing.	Successful Competitors.	Amnt. paid to Trustees.	Amnt. paid to Teacher.
HALIFAX,	5	Dartmouth	33.33	33.33
		Scldwick,	33.34	33.34
		Landell's	33.33	33.33
HANTS.	9	Avondale,	25.00	25.00
		West Noel,	25.00	25.00
		Hantsport,	25.00	25.00
		East Rawdon,	25.00	25.00

County.	No. Schools competing.	Successful Competitors.	Amnt. paid to Trustees.	Amnt. paid to Teacher.
KINGS,	8	Upper Church St.	33.34	33.33
		Upper Canard,	33.34	33.33
		Lower Canard,	33.32	33.33
ANNAPOLIS,	8	Melvern,	33.34	33.33
		Willett,	33.34	33.33
		Bridgeport,	33.33	33.33
DIOBY,	4	Beaver River,	25.00	25.00
		Weymouth,	25.00	25.00
		Sandy Cove,	25.00	25.00
		Westport,	25.00	25.00
YARMOUTH,	6	Lower Town,	25.00	25.00
		Milton,	25.00	25.00
		Pleasant Valley,	25.00	25.00
		Central Kemptville,	25.00	25.00
SHELburne,	5	Passage,	25.00	25.00
		Hibberts Brook,	25.00	25.00
		Lockes Island,	25.00	25.00
		Lower Wood's Harbour,	25.00	25.00
QUEENS,	4	Arbordale,	33.33	33.33
		Liverpool	33.34	33.33
		Kempt,	33.34	33.33
LUNENBURG,	2	Chester,	50.00	50.00
		Petite Reviere,	50.00	50.00
COLCHESTER,	11	Otter Brook,	25.00	25.00
		Awarded in aid of buildings, &c., for poor Sections in County, \$150.00		
CUMBERLAND,	5	Pugwash River	25.00	25.00
		Six Mile Road,	25.00	25.00
		Minudie,	25.00	25.00
		Westchester,	25.00	25.00
PICTOU,	2	New Glasgow,	50.00	50.00
		River John,	50.00	50.00
GUYSBORO',	4	Sherbrooke,	25.00	25.00
		Cape Canso,	25.00	25.00
		Awarded in aid of buildings, &c., for poor sections in County, \$100.00.		
ANTIGONISH,	3	St. Andrews,	25.00	25.00
		Awarded in aid of buildings, &c., for poor sections in County, \$150.00.		
INVERNESS,	5	Ingraham's Brook,	50.00	50.00
		Port Hood,	50.00	50.00
VICTORIA,	5	Middle River,	25.00	25.00
		Boularlaric,	25.00	25.00
		L. Washabukt,	25.00	25.00
		Hunter's Mountain,	25.00	25.00
CAPE BRETON,	4	Upper North Sydney,	50.00	50.00
		Sydney Mines,	50.00	50.00
RICHMOND,	3	Awarded in aid of buildings, &c., for poor sections in County, \$200.		

IN AID OF COUNTY ACADEMIES.

	Amnt. paid to Trustees.
Cape Breton County Academy,	\$300.00
Victoria " "	300.00
Richmond " "	300.00
Guyssboro' " "	300.00
Cumberland " "	300.00
*Annapolis " "	000.00
Digby " "	300.00
Shelburne " "	300.00
Queens " "	300.00
Lunenburg " "	300.00

* There being no Head Master, the grant of \$300 was appropriated in aid of buildings, &c. for poor sections in the County.

PROVINCIAL NORMAL AND MODEL SCHOOLS.

	Amnt. paid to Prin. & Teach.
Normal College,	\$195.00
Model Schools,	\$400.00

IN AID OF SPECIAL ACADEMIES.

	Amnt. paid to Directors.
Pictou Academy,	\$500.00
Mount Allison Academy,	500.00
Horton Collegiate Academy,	500.00
Yarmouth Seminary,	500.00
Halifax Grammar School,	300.00
Institution for Deaf and Dumb,	1000.00

IN AID OF COLLEGES.

	Amnt. paid to Governors
Kings' College,	\$700.00
Dalhousie College,	500.00
Acadia College,	200.00
St. Francis Xavier's College,	700.00
Mount Allison College,	200.00
St. Mary's College,	700.00

For the Journal of Education.

MR. EDITOR,—In several of the sections visited the past month, the work of providing school accommodation is rapidly progressing. Taking these sections in the order in which they appear in my "notes of inspection," we have

1. *The Pleasant Valley Section.*—The house in this section is 22 x 36. The outside is finished and painted, and the inside will be ready for school by the 1st November. It reflects much credit on the section, which is weak and scattered.

2. *The Rockville Section.*—The house in process of building in this section is one of the finest in the County. It is 27 x 60, with 14 feet posts. It will probably be furnished with patent desks and seats, and will be ready for school the coming term.

3. *The Upper Selma Section.*—This section, though having sustained a loss of \$800 or \$1000 in the former house, which was destroyed by fire, is now engaged in the erection of another still more splendid and stylish. It is 28 by 60, with a front entrance 10 x 20. It will be finished and furnished by 1st November.

4. *The Brooklyn Section.*—The house in this section is 34 x 60, and the ceiling will be 18 feet above the floor. It will be furnished with patent desks and seats, and ready for school by 1st November.

5. *Mutton Cove Section.*—This section, which had been without a school house of any kind for some years, commenced building a short time since. The building is 28 x 42, and is to be completed by 1st November.

6. *The Tenecape Section.*—The house in this section was finished a few months ago. It is painted inside and out, and furnished with improved Dawson seats and desks.

7. *The Birch Brook Section.*—This is a very weak and sparsely settled section. A neat and stylish little building, 18 x 22, has, however, been erected, and the outside finished and painted, and the inside will be finished by 1st November.

An improvement in the general character of the schools is quite manifest. The attendance is considerably greater than for the corresponding term last year.

D. M. WELTON,
Inspector, Hants Co.



OFFICIAL NOTICES.

EXTRACT FROM THE MINUTES OF THE COUNCIL OF PUBLIC INSTRUCTION, JULY 7TH, 1866.—"Provision being made by the School Law for the publication of a *Journal of Education*, the Council of Public Instruction directs that the said *Journal* be made the medium of official notices in connexion with the Educational Department."

T. H. RAND,
Sec'y to C. P. I.

I. Examination of Teacher.

NOTICE IS HEREBY GIVEN, that under authority of an Act passed in the late session of the Legislature, the Council of Public Instruction has made the following Regulations in reference to the Examination and Licensing of Teachers of Public Schools in this Province:

Of Existing Licenses.

1. Subject to all the limitations and restrictions under which they were originally granted, all legal and valid Licenses now held shall continue to be legal and valid as follows:—

Head Masters' Certificates,	1	7th November 1st, 1868.
Licenses of the First Class,	1	" " " "
" " Second Class,	"	" 1869.
" " Third Class,	"	" 1870.

2. Licenses issued by the late Boards of District Examiners remain valid as above in the District for which originally issued, and for any other District or Districts in which they may have been duly endorsed previous to May, 1867. "Permissive" Licenses cease to be valid on the expiration of the period for which they were originally granted.

Of the Issue of Licenses in Future.

1. All Licenses granted in future shall be under seal of the Council, and shall be valid for the whole Province.
2. The Syllabus of Examination for Licenses of the several Grades shall be the same as that published in the Regulations of the Council, 1866.
3. The Examination Questions shall be uniform for the whole Province, and, where possible, each candidate shall be furnished with a printed copy of the same.
4. All candidates for License will be required, on presenting themselves for examination, to furnish a written certificate of good moral character, signed by a Minister of Religion or by two of her Majesty's Justices of the Peace; and such certificate shall be filed in the Educational Department, together with the other papers relating to the candidate's examination.

5. There shall be two examinations each year, one in each School Term. The examination for the current Term shall begin on

TUESDAY, FIRST DAY OF OCTOBER NEXT, at 9 o'clock, A.M.

6. The following shall be places of examination:—
Sydney, Baddeck, Margaree Forks, Port Hood, Arichat Guysborough, Sherbrook, Antigonish, Pictou, Amherst, Truro, Halifax, Windsor, Kentville, Bridgetown, Digby, Yarmouth, Shelburne, Liverpool and Lunenburg.

7. Persons desirous of being examined shall be at liberty to choose of the above-named places the one most easy of access.
8. Candidates are to furnish their own writing material.
9. All the written exercises of Candidates shall be forwarded by the Deputy Examiners as soon as possible to the EDUCATION OFFICE, to be submitted to the Board of Examiners for their judgment thereon.
10. Licenses will be forwarded by mail to the Post Office address of candidates.

The Council has been pleased to appoint the following persons to be Deputy Examiners, to conduct the examination at the several places specified in Reg. 6, viz.:

Sydney: the Inspector of Schools for Cape Breton County.	
Baddeck: " " Victoria	"
Margaree Forks: Rev. John Chisholm.	"
Port Hood: the Inspector of Schools for Inverness	"
Arichat: " " Richmond	"
Guysborough: " " Guysborough	"
Sherbrooke: Rev. John Campbell.	"
Antigonish: the Inspector of Schools for Antigonish	"
Pictou: Rev. James Bayne, D.D.	"
Amherst: the Inspector of Schools for Cumberland	"
Truro: " " Colchester	"
Halifax: " " Halifax	"
Windsor: " " Hants	"
Kentville: " " Kings	"
Bridgetown: " " Annapolis	"
Digby: " " Digby	"
Yarmouth: " " Yarmouth	"
Shelburne: " " Shelburne	"
Liverpool: " " Queens	"
Lunenburg: " " Lunenburg	"

Sep. 7

II. Holidays and Vacations.

Notice is hereby given to Trustees of Schools and others, that CHAPTER XI. of the COMMENTS AND REGULATIONS OF THE COUNCIL OF PUBLIC INSTRUCTION. "Of Time in Session, Holidays, and Vacations" has been revised as follows:

HOLIDAYS.

The following Regulations have been added to SECTION 3, of the Chapter above named.

- a. When for any cause the Trustees of a school shall deem it desirable that any prescribed Teaching Day should be given as a Holiday, the school or schools may be kept in session on the Saturday of the week in which such Holiday has been given, and such Saturday shall be held to be in all respects a legal Teaching Day.
- b. When, owing to illness, or for any other just cause, a teacher loses any number of prescribed teaching days, such teacher shall have the privilege of making up for such lost days, to the extent of six during any Term, by teaching on Saturdays; But
- c. No school shall be kept in session more than five days per week for any two consecutive weeks;
- d. Nor shall any Teacher teach more than FIVE DAYS PER WEEK on the average (vacations not being counted) during the period of his engagement in any term.

The Anniversary of the QUEEN'S BIRTHDAY shall be a Holiday in all the Public Schools, as heretofore.

VACATIONS.

The following Regulations have been made in lieu of SECTION 4, of the Chapter above named:—

1. The CHRISTMAS VACATION shall remain as heretofore, the "eight days" being held to mean week-days other than Saturdays.
2. Instead of two vacations during the summer term (a week at seed time and a fortnight at harvest) as heretofore, THREE WEEKS (15 week-days other than Saturdays,) shall hereafter be given as vacation during the summer term, at such time or times as the Trustees shall decide: Nevertheless
3. In order that the due Inspection of Schools as required by law, may not be interfered with, each Inspector shall have power, notwithstanding anything in the foregoing Regulations, to give notice of the day or days on which he proposes to visit any school or schools in his county for the purposes of Inspection, and to require that on the day or days so named such school or schools shall be kept in session.
July, 1867.

III. To Teachers not supplied with Registers.

As a much larger number of schools are in operation this term than was anticipated, the edition of Registers is insufficient to supply a copy for each teacher engaged. All teachers who have been unable to procure a Register are notified that till the close of the present term, Oct. 31st, a careful record of the daily attendance of pupils will be accepted as a compliance with the requirements of the school law with respect to registration. In every such case, before signing the certificate contained in the TRUSTEES' RETURN, the teacher is authorized to erase the words "the prescribed Register," and insert in their stead, "a record of the daily attendance of the pupils."
May, 1867.

IV. Teachers' Agreements.

The attention of Teachers and Trustees is again called to the necessity of complying with the provision of the Law in relation to the disposal of the County Fund. It appears from the School Returns of the past Term that some teachers have in their agreements with Trustees in respect to salary,

tary to Trustees, and shall in all respects conform to and observe all such rules, orders and regulations as now are or may be from time to time established for or in respect of the said Office, and shall well and faithfully keep all such accounts, books, and papers, as are or may be required to be kept by him in his said Office, and shall in all respects well and faithfully perform and execute the duties of the said Office; and if on ceasing to hold the said Office, he shall forthwith, on demand, hand over to the Trustees of the said School Section, or to his successor in office, all books, papers, moneys, accounts, and other property in his possession by virtue of his said Office of Secretary—then the said obligation to be void—otherwise to be and continue in full force and virtue.

Signed, sealed, and delivered }
in the presence of }
[Name of Witness.] } [Name of Secretary.] (Seal)
[Names of Sureties.] (Seals)

WE, THE SUBSCRIBERS, two of Her Majesty's Justices of the Peace for the County of _____ do certify our approbation of _____ (names of Sureties,) within named, as Sureties for the within named _____ (name of Secretary,) and that they are to the best of our knowledge and belief persons of estate and property within the said County of _____ and of good character and credit, and sufficiently able to pay, if required, the penalty of the within bond. Given under our hands this _____ day of _____ A. D. 186 _____ [Names of Magistrates.]

IX. List of Inspectors.

- J. R. Miller.....Halifax.
- Rev. D. M. Welton, M.A.....Windsor.
- William Eaton.....Kentville.
- Rev. G. Armstrong, M.A.....Bridgetown.
- Rev. P. J. Fillet, B. A.....Weymouth.
- G. J. Farish, M. D.....Yarmouth.
- Rev. G. M. Clark.....Shelburne.
- Rev. D. O. Parker.....Arbordale, Queens Co
- W. M. B. Lawson.....Lunenburg.
- H. C. Upham.....Great Village.
- Rev. James Christie.....Amherst.
- M. T. Smith.....Picton.
- Robt. McDonald.....Antigonish.
- S. R. Russell.....Guysboro'.
- James Macdonell.....Port Hood.
- C. R. Macdonald.....Baddeck.
- Edmund Outram, M. A.....Sydney.
- W. R. Butler.....Aricliat.

ADVERTISEMENTS.

SITUATION WANTED.

A young man of five years experience in teaching, and holding a first class license, wants a situation as Teacher. Salary from Trustees at the rate of \$400 per year. Address J. W. W., 46 Cornwallis Street, Halifax.

TEACHER WANTED.

THE Trustees of Sherbrooke, St. Mary's, require, by November 1st, a Male Teacher of the first class, to take charge of a graded school of two departments, and to teach the advanced department. No one need apply who has not had considerable experience, and understands well how to secure and preserve good organization, order, and management of the whole school.

The house is fitted with improved furniture, and the Trustees desire that the advanced department shall compete for the Superior School Grant. Salary from the Trustees at the rate of \$300 for the school year. Applicants must state their age and experience, and furnish testimonials of ability and character. Address, W. I. PYE, Sec'y. to Trustees, Sherbrooke, Guysboro' Co.

SCHOOL DESKS.

THE undersigned is prepared to supply School Trustees with the improved School Desks recommended by the Council of Public Instruction for use in the Public Schools throughout the Province.

The desks and chairs are made of thoroughly seasoned oak and ash, and the standards or supports are made of iron. The desks are finished in oil, and the chairs are varnished.

The following table will furnish any needed information, as to sizes, &c. The prices attached are for one desk and two chairs:

Age of Pupils.	Height of Chairs.	DOUBLE DESKS.				Prices.
		Height of side next to Pupil.	Length.	Width.	Space between desks for chairs.	
5 to 6 years.	11 inches.	21 inches.	36 inches.	12 inches.	14 inches.	\$4 00
6 to 8 "	12 "	23 "	39 "	13 "	15 "	4.25
8 to 10 "	13 "	25 "	42 "	13 1/2 "	15 1/2 "	4.50
10 to 12 "	14 "	27 "	44 "	14 "	16 "	4.75
12 to 14 "	15 "	28 "	46 "	14 1/2 "	16 1/2 "	5.00
14 to 17 "	16 "	30 "	48 "	15 "	17 "	5.25
17 "	17 "	32 "	49 "	16 "	17 "	5.50

* * * Single Desks (i. e. desks accommodating one pupil each) will be manufactured if required.

Desks and chairs (with screws) packed and delivered on board the cars, steamer, or packet at WINDSOR, at the above prices. Terms cash on delivery. Trustees wishing to procure desks should send in their orders as early as possible. Specimen desks and chairs may be seen at the EDUCATION OFFICE, Province Building, Halifax. Address, EDWARD CURRY, Windsor, N. S.

Books for School Teachers.

COMMON SCHOOL EDUCATION, By Currie.
EARLY AND INFANT SCHOOL EDUCATION, By Currie.

For sale by A. & W. MACKINLAY.

MORTON'S MAGAZINE LIBRARY,

No. 185 Hollis Street ---- Next to the Union Bank.

No FINES! No TIME LIMITS!

The following Periodicals are supplied on the usual terms, or may be subscribed for at the prices named:

- All the Year Round.....\$3 00
- Argosy.....1 50
- Arthur's Magazine.....1 50
- Atlantic Monthly.....3 50
- Blackwood's.....4 00
- Boy's Monthly.....1 50
- Bow Bells.....2 00
- Belgravia.....3 00
- Chambers' Journal.....1 50
- Cassell's Monthlies.....1 50
- Churchman's Magazine.....3 00
- Christian Work.....1 50
- Christian World.....1 50
- Cornhill.....3 00
- English Woman's Fashions.....3 00
- Family Treasury.....1 50
- Good Words.....1 50
- Godey's Lady's Book.....3 00
- Harper's Monthly.....3 50
- Ladies' Treasury.....2 00
- Leisure Hour.....1 50
- London Magazine.....1 50
- London Society.....3 00
- Meliora.....1 00
- Once a Week.....3 00
- Penny Readings.....1 50
- People's Magazine.....1 50
- Quiver.....1 50
- Saint James' Magazine.....3 00
- Sunday at Home.....1 50
- Sunday Magazine.....1 75
- Temple Bar.....3 00
- Tinsley New Magazine.....3 00
- World of Fashion.....3 25
- Young English-woman.....1 50
- Young Lady's Journal.....2 25

* * * 25 cts. additional for postage on all Monthly Journals mailed to the country. Prepayment may be made in postage stamps or otherwise.

The following Newspapers may also be obtained regularly as above, and mailed to subscribers in the interior without any additional charge for postage. Subscriptions payable in advance. Postage stamps received for sums under \$4.00

- Army and Navy Gazette...\$6 50
- Alliance Temperance Newspaper...2 00
- Athenaeum.....4 00
- Bell's Life.....6 50
- British Messenger.....0 30
- British Workman.....0 30
- British Workwoman.....0 30
- Band of Hope Review.....0 30
- Budget of Fun.....1 50
- Children's Prize.....0 30
- Children's Friend.....0 30
- Christian Times.....2 00
- Cassell's Family Paper.....1 50
- Chemical News.....6 50
- Cottage Gardener.....4 00
- Canadian Farmer.....1 25
- Frank Leslie's Newspaper.....4 00
- Fireside Readings.....0 50
- Fun (London Weekly).....1 50
- Family Herald.....1 50
- Guardian (London).....6 50
- Gardeners' Chronicle.....6 50
- Gardeners' Magazine.....3 00
- Harpur's Newspaper.....4 00
- Illustrated London News.....7 00
- Illustrated Times.....4 50
- Illustrated Penny Newspaper.....2 00
- Illustrated Weekly News.....2 00
- Illustrated Sporting News.....2 00
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