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THE CANADA

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JULY—AUGUST, 1880.

GOLDWIN SMITH'S LIFE OF COWPER.*

THE admirable series of *bijou* biographies edited by Mr. Morley has been enriched by Mr. Goldwin Smith's delightful book on Cowper, which even when compared with the work of Mr. Morley, Professor Huxley, or Mr. Leslie Stephen, seems to us entitled to at least a primacy *inter pares*. The life and literary career of Cowper is a subject requiring a peculiar delicacy of sympathetic criticism; all the other great men of letters, from Hume and Gibbon to Thackeray, whose memoirs are given in this series, are so directly in unison with modern ideas as to make an appreciative treatment of their work easy to the writer of to-day. In the case of Cowper, to the superficial critic, it might seem otherwise. As John Keble was the representative poet, in the feeble prettiness of his verse, of that wave of Anglican pseudo-Catholic revival which has left its rubbish and its wrecks "on every shore," so William Cowper was the laureate of a far greater religious revival, that which was the heir and echo of Puritanism, far more earnest and noble than the *culte* of the chasuble and the mitre, and still surviving in that Methodism which is, as Mr. Goldwin Smith says, the greatest Protestant Church now on earth. But this religious movement to which Cowper certainly adhered, has scant sympathy with modern ideas of progress, except perhaps in its earnestness and essentially popular character. It belongs to the past, and, as a factor in modern thought, is as dead as Druidism.

But the impression left by Mr. Goldwin Smith's estimate of Cowper is that Calvinistic Evangelicalism is, after all, only a foreign element in Cowper's poetry. It is quite otherwise with Keble. His poetry, second rate, forced and effeminate, is nothing without stained-glass windows, cathedral aisles, and other ecclesiasticisms; all through it, such as it is, we hear

* COWPER, by GOLDWIN SMITH, M.A., in Morley's Series of English Men of Letters. London and New York: Macmillan & Co. Toronto: Willing & Williamson.

the music of the organ, or rather of the harmonium. Not so with Cowper. In his best literary form he is emancipated from the religious teaching in which he at times sought shelter, nay he seems in his brightest and happiest work to be in direct opposition to it. Evangelicalism is strongest in the least poetical of Cowper's lyrics, the hymns, in which he is unlike himself, with a few exceptions, and like Mr. Newton's sermons. It clouds and encumbers the "Task." The gloom of its austere theology finds despairing expression in the "Castaway," that remarkable anticipation of Byron's vigorous pessimistic verse. But the delicate humour which plays over the letters and the minor poems, the love of humanity and nature in the better parts of the "Task," are quite alien elements to the morbid theology which taught, which still teaches, to those who will hear it, that "the world" is the very antithesis to goodness—that "nature" is only so much fuel for judgment fires, and humanity the predestined heir of perdition, all except the favoured minority in "the narrow way." What was best in Cowper's religion, the comfort which its calmer aspect gave, the quietism, "the Divine love and the rapture of the heart that enjoys it"—"the evangelical nirvana"—as Mr. Goldwin Smith so happily calls it—was indeed expressed in Cowper's poetry, but was no factor in its most winning peculiarities. And what is best in the poetry is there in spite of the religion. Like Puritanism, Evangelicalism had had no sense of humour. In the letters and *vers de société* we escape from Mr. Newton's preaching and forget all about election and reprobation, and are with Mrs. Unwin and Lady Austin and Lady Hesketh, by the river, or in the garden, or at the tea table, content to enjoy the Present, and be of the world worldly.

Mr. Goldwin Smith teaches us that Cowper may be numbered among the precursors of the European Revolution. In this respect he is most felicitously compared to Rousseau. In spontaneity of self revelation "Mes Confessions" have the same charm as the Letters. Cowper's Whiggism was in contrast with the noble aspirations for liberty which appear in his lines on the Bastile, and his favorable estimate of the French Revolution. The Whig is seen in his verses—poor fooling, and feeble doggrel they are—on the American Revolution. This is what Cowper could write of Washington:

> "You roaring boys who rave and fight
> On the other side of the Atlantic,
> I always thought you in the right,
> But most so when most frantic."

We feel the force of the estimate given of Cowper's position as the most important, all things considered, in purely English poetry—that of Burns being excepted—between the Augustan poets and the modern. As to the Letters, Mr. Goldwin Smith gives them the highest place. They are certainly the most natural, and have the grace that belongs to an almost lost art. Gray's letters are essays *in petto;* those of Horace Walpole, as is said at page 95, "are Memoirs, the English counterpart of St. Simon." "If the first place is shared with him by any one it is by Byron." May not the letters of Burns, for whom, as Mr. Goldwin Smith says elsewhere, Cowper felt his affinity, be placed in the same high class?

The simple and touching story of Cowper's life is told by Mr. Goldwin Smith with the grace and *curiosa felicitas* which are peculiarly his own, and with a love for his subject which yet does not set aside his rare powers of criticism. The first chapter treats of Cowper's early life, the childhood, schooldays and the Temple with its love idyl of poor Theodora. Mr. Goldwin Smith conclusively proves that the exciting cause of Cowper's madness

was not religious, but physical. But was it not religious dogma that gave his insanity the peculiar turn it took to religious despair, and made possible those ghastly Sapphics at the beginning, and "The Castaway" at the end?

The remaining chapters tell the story of Huntingdon, of Olney, the literature and the friendships, treating exhaustively a subject of which all available information is already before the public, a subject to be best illustrated, as is done here, by abundant extracts from Cowper's poems and letters. To all our readers engaged in the teaching profession, to all who are anxious for self-culture, we recommend the perusal, again and again, the thorough assimilation, of this charming volume, which reminds us of Macaulay's critical biographies, though it has not their demerit of a somewhat rhetorical form, excessive antithesis and love of paradox; and is far more thoughtful and suggestive. Attention should be directed to the gem-like perfection and lustre of some of Mr. Goldwin Smith's sentences, those which describe the *motif* of the "Task;" the passage which contrasts Cowper with Pope as a painter of Nature; to the following: "He is the poetic counterpart of Gainsborough, as the great descriptive poets of a later and more spiritual day are the counterparts of Turner." But in order to derive full benefit from this or any other masterpiece of literary biography the reader should make a conscientious and loving study of Cowper's poetry. The passages quoted from the "Task" should be memorized. There is a just prejudice against mechanical cramming of the memory, but an intelligent use of memory as a storehouse for the best and noblest results of culture, is, we believe, too much neglected by a generation which dislikes mental labour. We also point attention to what is said at page 11:

"Cowper evidently became a good classical scholar, as classical scholarship was in those days, and acquired *the literary form of which the classics are the best school.*"

This is especially seen in some of the minor poems composed in a two-fold form, Latin and English, each version giving a stereoscopic completeness to our view of the poem. For instance the noble lyric on the loss of the *Royal George* is also cast into the form of a Sapphic ode, which, if we may express an opinion, is infinitely superior to anything Vincent Bourne ever wrote, with whose Latin verses we have for years been familiar.

> Plangimus fortes! periere fortes
> Patriam propter periere cives.
> Bis quater centum, subito sub ulto
> Æquore mersi.

The writer of this article is collaterably descended from the Hayley family, and can fully endorse Mr. Goldwin Smith's estimate of Cowper's friend, who though inferior as a writer, was as kind-hearted and honourable a country gentleman as lived in the Georgian era. This relationship is mentioned only to give force to the statement that Southey's view of the cause of Cowper's engagement with Theodora being broken off, which Mr. Goldwin Smith accepts, was also that told me by my grandfather, Hayley's first cousin. On the same authority I state that Cowper's name was by the poet's friends pronounced Cooper. Cowper's charm of personal character, his truest claims to literary survival, are well stated in some lines of Hayley, which deserve to be remembered:

> Sense, fancy, wit, suffice not all to raise
> So clear a title to affection's praise;
> His highest honours to the heart belong,
> His virtues formed the magic of his song.

The *motif* of this book is best set forth in one of the concluding sentences, remarkable for its self-restrained

power as well as for the force with which it sums up the lesson of Cowper's unhappy yet not unfruitful life. "He belongs to a particular religious movement, with the vitality of which the interest of a great part of his work has departed or is departing. Still more emphatically and in a still more important sense does he belong to Christianity. In no natural struggle for existence would he have been the survivor; by no natural process of selection would he ever have been picked out as a vessel of honour. If the shield which for eighteen centuries Christ, by His teaching and His death, has spread over the weak things of this world, should fail, and might should again become the title to existence and the measure of worth, Cowper will be cast aside as a specimen of despicable infirmity, and all who have said anything in his praise will be treated with the same scorn."

Reviews of this book have appeared in the New York *Sun*, in the *Canadian Monthly*, and in the *Canadian Methodist Magazine*. In all these it has been awarded the praise due to its appreciative, thorough and artistic picture of the poet of Olney. The *Spectator* has on the other hand dealt with Mr. Goldwin Smith's work in a spirit of determined fault-finding, which is evidently the result of a personal grudge. This review was reproduced in the *Globe*, whose good taste and sense of literary honour did not, however, lead to the reprinting in the *Globe's* columns of the *critiques* which took a very different view of the merits of the work in question. And since then the *Globe* has not been ashamed to insert an article from the *Saturday Review*, the malicious hypercriticism of which is only equalled by its dulness, an article which certainly could not have gained admission, on its literary merits, into the columns of those much abused Canadian literary organs which the *Globe* delighteth to dishonour. The *Saturday Review* charges Mr. Goldwin Smith with never having read Hayley's Life of Cowper! The writer of this notice is, as has been stated, nearly related to the Hayley family—that circumstance led him while talking on the subject of Cowper's biographers to Mr. Goldwin Smith, to allude to Hayley's book. He is in a position to state that the *Saturday Review's* insinuation is not only an impudent fabrication, but that Mr. Goldwin Smith has made a careful study of Hayley's biography, whose importance as a source of information the *Saturday Review* exalts above its very moderate merits in order to depreciate the better work of an abler man. This forsooth is criticism! And this is what the *Globe* singles out for reprint! Another critical method in which the *Saturday Review* coincides to a remarkable degree with the hypercriticism of the other review named above is that of finding fault in unmeasured terms with Mr. Goldwin Smith's estimate of Cowper, and then unblushingly to repeat a statement identically the same in terms with that which it condemns! For instance, the *Saturday Review* says: "Of the Olney Hymns Mr. Goldwin Smith shews himself one of the worst of critics." The reviewer sustains this by quoting from Mr. Goldwin Smith the following: "Cowper's Olney Hymns have not any serious value as poetry." For stating this Mr. Smith is stigmatized as "one of the worst of critics!" But the *Saturday Review* goes on to state the same thing. It says: "It so happens that Cowper's Hymns are not merely not good as poetry, but they are unusually bad." In its better days the *Review*, which John Bright condescended to christen by a name which still sticks to it in its decadence, did not blunder in this fashion of maundering malignity. Its vinegar is now sadly subacid, its salt is only fit to be cast where salt that has lost its

savour is thrown. Where are its once brilliant social articles, its society sketches? These are replaced by feeble platitudes. Its reviews are said to be chiefly written by women, who are, no doubt, old enough to know better.

If we dissent from anything in Mr. Goldwin Smith's charming, appreciative, and thoroughly just criticism of a writer who must be loved as well as criticized, and whom we have special reasons for loving, it is from the what to us seems too low an estimate of the Olney Hymns. As poetry, perhaps Mr. Goldwin Smith is quite right—as hymns we venture to think them superior to any modern hymns, but those of Wesley, Madan and Toplady. The *Saturday* would prefer Heber, Keble, and no doubt Faber. But Heber's most successful hymns are rather odes in which the essential character of the hymn is wanting—one is addressed to the star of the East, the other to the winds of the coast of Ceylon. Keble is sometimes poetical, but generally forced, ecclesiastical, feeble, no healthy voice of the soul's devotion. Faber, as poor Neale saw of Faber, and failed to see of himself, is utterly bad, a Jesuit tied up with bonds of musical jingle. Most modern hymns are on a level below double acrostics and on a par with valentines. It might seem that the valentine writers got serious in their old age, and took to writing hymns, a change of style but no improvement. The *Saturday* proceeds to state that "in his hymns Cowper falls into depths below Toplady and Erskine." He instances what is certainly not one of the best of Cowper's hymns, "God moves in a mysterious way," but surely does not deserve to be stigmatized by the *Saturday* as "unique among English hymns for glaring faults of style," (its simplicity of rendering a sublime ideal of the Divine immanence in Nature, borrowed from the Psalms, with perhaps a colouring of Sophocles in one chorus in Œdipus, is its most striking charm) "for false ornament!"—ornament is conspicuous for its absence; Cowper's hymns have the simplicity of a nun who would have thought it "worldly" to wear flowers in her bonnet; "for confused imaginery"—the hymn is categorical and clear; and for "unconcious indecency of appeal to the Deity" (*sic*)—it is perfectly obvious that the hymn

> "God moves in a mysterious way
> His wonders to perform;
> He plants His footsteps in the sea,
> And rides upon the storm!"

is no "appeal to the Deity, but a hymn of praise setting forth His Almightiness in language whose unornamented simplicity is identical with that of the oldest poetry of religion.

Mr. Goldwin Smith's estimate of Cowper's version of Homer is much the same as that of Mr. Matthew Arnold. Our conviction is that so eloquently enforced in the "Essays in Criticism," that the hexameter rhythm of the original is the only vehicle worthy of Homer or Virgil. It is true Mr. Matthew Arnold, in a letter received by us from him last month on this subject, says that "hexameters are never popular with the English public." In demurrer to this we point to Clough and to Longfellow. On the subject of Homer the *Saturday*, by the very unfair device of incomplete quotation, makes Mr. Goldwin Smith call Andromache "a savage woman." To be fairly understood the passage should be read with its context. A similar trick is played with another sentence, "poetry can never be the direct expression of emotion." By being thus isolated from its context, this is made to seem to imply that poetry is never the expression of emotion—the reader does not realize that the word "*direct*" gives the true meaning. The

direct expression of emotion is a laugh or a cry. Poetry is the expression of emotion after it has gone through a process of meditation and composition. The emotion may have changed its character in this process; for instance, Lord Byron was probably anything but in a melancholy mood when he wrote his most pessimistic verse.

The review in the *Saturday* is as unjust as it is dull. The writer has no power of sarcasm, and does not seem to know his own meaning. That a leading journal such as the *Globe* should republish such trash as a means of indirect mud-throwing at a great writer of whose presence in Canada all Canadians ought to be proud, is only another instance of the *Globe's* deplorable want of the common sense of fair play, for which it received a deserved castigation from the *Mail*. In the latter journal, since writing the above, there has appeared a letter from Mr. Smith vindicating his work with considerable strength of the calm but trenchant irony of which he is such a master. One instance of this we cannot resist quoting. The *Saturday* calls Toplady a failure as a hymn writer. Mr. Goldwin Smith wonders if the author of the *Saturday's* article ever heard the name of the author of "Rock of Ages." The blow is a deft one, but according to the true proverb, "Against stupidity the gods themselves fight in vain."

C. P. M.

READINGS FROM AN OLD GEOGRAPHY.—II.

BY DAVID BOYLE, ELORA.

TAKING up some of the dropped stitches from the thread of our *Readings* last month, we return to Europe, the only countries of which continent previously noticed being England, Scotland and Ireland.

In answer to the question, What is the state or condition of Switzerland in general? our geographer informs us that "this Country abounds with high Mountains. Some are covered with Ice and Snow all the Year round. Others are covered with Trees and Pasture, where the Peasants drive their Cattle to feed above the Clouds." As if driving cattle to feed above the clouds were a matter of scarcely any difficulty! But the next paragraph of the answer is still more delightfully quaint. "Some Mountains are very incommodious to the Inhabitants; many of them look with a terrible Aspect as if they were falling that Moment; upon others the thick Woods harbour various Creatures, who sometimes do Abundance of Mischief among the Cattle." "Some Mountains are very *incommodious* to the Inhabitants" reminds us of the Frenchman who accounted for his downcast looks to an English friend by saying that he had just heard of his father's death, and therefore felt very much *dissatisfied*.

A rare bit of etymology is presented to us in the following definition of Germany: "Germany, in its proper language is called Deutchland, *i.e.*, *Dutch Land*, which name is derived from the first Inhabitants, *Teutones*, that people worshipping God, under the name of *Theuth*, called their coun-

try *Theuth Land, i.e.*, the *Land of God.*" It would be wearisome merely to name all the palatinates, electorates, marquisates, principalities, dukedoms, archbishoprics, bishoprics, and independent states, that are fully treated of in connection with the Holy Roman Empire, as Germany was then, in court style, designated. We may only pause a little to smile at the story of the Golden Table, and the legend of the Ratcatcher.

In Lunenburg "the Church of St. Michael has been famous on account of the Golden Table, which is placed before the Great Altar. This Table is of pure *Arabian* gold, 8 foot long, and 4 foot wide. It was, by the Emperor *Otho*, presented to the Church after he had gained it by the dint of Arms from the *Saracens* in *Italy*. (!) The Rim was embellished with precious Stones of immense Value, and on the Table were chased in three rows several Histories of the Bible. In the year 1698 the Table was stripped of great Part of the Jewels by a Gang of Thieves, who took from it 200 Rubies and Emeralds, together with a large Diamond."

A more wretchedly constructed tale, it would be difficult to conceive of, yet the "Saracens in Italy" with such a table, "Histories of the Bible," and all, are readily swallowed by Mr. Cowley, at which we cease to wonder, remembering how kindly he took to the Scotch "Geese that breed in Logs of Wood floating in the Sea," the "Floating Island in a Lake," and the "Four-Elements-in-Perfection" fable of Kilkenny.

Now for the Ratcatcher. "Hamelin, a famous city:—In 1284, a Ratcatcher freed this City from those Vermin by playing on a Whistle and thereby enticing them to follow him out of the gate into the River, where they were drowned. The Ratcatcher demanding his Fee of the Inhabitants was denied it. In Revenge he tuned his Pipe again, and 130 Children followed him that were never heard of since,

. . . . and the People date their Deeds, etc., not from the Birth of Christ, but from the Time of the Departure of the Children. In this City also is a rich Salt-pit, which was discovered about 700 Years ago by a Sow wallowing in that Place and drying herself in the Sun, so that she was found covered with fine, white Salt. This Creature is still shewn, preserved in a Glass Chest." For aged salt pork probably nothing can approach that of Hamelin. The piper Ratcatcher incident, we need hardly remind the reader, is the theme of Robert Browning's well-known ballad "The Pied Piper of Hamelin."

Before leaving Germany the temptation is too strong to quote just another account relating to Sonderhausen. "In the Arensal, (of *Sonderhausen,*)" says the geography, "is an Idol about a Yard high, which is hollow, what mettle it is of no Body knows. At the Crown of its Head is a Hole, when fill'd with Water, stopped with a Bung, and placed over a Fire, the Idol will sweat prodigiously, the Bung will fly out with a thundering and rattling Noise, and the Water spout from it like Fire, which, if it reaches any Wood will set it in a flame, and cause a horrible stench."

It is perhaps not too far-fetched to suppose that the whole of the foregoing legend is founded upon some tradition of spontaneous combustion in connection with an ancient barrel of *saur-kraut.* At all events the "prodigious sweat" and the "horrible stench" would seem to lend favour to this theory.

The shriek of freedom and Kosciusco's fall are vividly recalled to mind by the statement regarding Poland, that "This whole large Country has a King, who is elected, and is the only elected Kingdom (!) now in Europe."

At least a portion of what our author says about "*Prussia* in General," will be news to most readers. "It has large forests, which abound in Venison (!) and wild Fowl. In some Parts there are Buffaloes, and other wild Creatures, which are sometimes brought to the Amphitheatre at *Konigsberg* to be baited, for the Diversion of the King and the Nobility."

The discovery of a German salt-mine by a German sow was quite as unintentional as the finding of the Golden Horn in Sleswick, by "a Girl who was walking from *Osterby* to *Mell Tundern*, [and who] hit her toes against something pointed. Though she knew not what it was at first, yet she found by digging it up with her Fingers to be a Horn of the finest Gold; it is about 100 Ounces Weight, and embellished with several Hieroglyphical Figures, much in the manner of the Egyptian Pyramids; it is twenty-five Inches long and four Inches wide at the Opening. It is to this Day preserved in the Royal Treasury, as a curious Piece of Antiquity."

For meaning anything, or nothing, commend us to the last sentence in the following paragraph, describing a province in Norway: "Wardus, in Northland, which has its name from an old Castle that is upon an Island in the *Ice* Sea. The natives are called Fin- and Lap-landers. Here it begins to be six Months Day and six Months Night." Of the Norwegians we read "The Inhabitants have neither Corn-fields, Vineyards, nor Gardens, to cultivate, but for their living are obliged to spend their Time in Hunting and Fishing. They dry the Fish and melt the Fat, which afterwards they sell to other nations. They have good Horses, which sometimes for want of Grass or Hay are forced to feed upon Stock Fish. The People are not very fond of Money, but rather barter their Commodities. . . ." Thrice happy people! No specie, no rag-money, no root of all evil! Blessed Scandinavians! How utterly the race has disappeared! Miserable, by contrast, must have been the sordid cultivators of Crim Tartary, of which Mr. Cowley says, "This Country Abounds with Wheat and Millet; a Cart Load with as much as two Oxen can draw is sold for two Crowns. They have besides good Pasture and Abundance of Cattle, good Horses and Camels, and Provision is there so cheap that a Hen is sold for two Pence, and fifteen Eggs for a Penny. They have Plenty of Fish, but they choose rather to live upon Horse Flesh. The Tartars in General know no other Calling but War." It may not be easy at first sight to see how the country can abound with wheat and millet, at the same time that the people generally "know no other Calling but War," and even a second consideration fails to throw any light upon the anomaly; perhaps these grains grew spontaneously, or perhaps the cultivation was merely that poetical "tickling of the soil to make it smile," of which we have somewhere read, or perhaps—but no, we give it up.

Bidding adieu to Europe, we turn to Asia, and reasonably expect to find amusement and edification by the change, not that the repository of rich things is by any means exhausted in so far as Europe is concerned, but we sigh for "fresh woods (not fields, as commonly quoted) and pastures new."

Alighting upon India we meet with a highly coloured description of the great Mogul. Let us take a long breath! "His Revenues amount yearly to 750 Millions of Crowns; besides the Treasure left by his Predecessors, which is reckoned to amount to 250 Millions of Crowns, both in Coin and Jewels. His Expenses, on the other Hand, are very great: he keeps in constant Pay 300,000 Horse, besides an innumerable army of Foot. By a List of his Encampment against the

Persians, in 1658, it appears that the Mogul then had 216,000 Cavalry, and 864,000 Infantry, besides 50,000 that served in his Camp. The Great Mogul also has a Guard of 100 Tartarian Ladies armed with Bows, Scimeters and Darts, commanded by one of their own Sex. His Birth-day has been kept in a very extraordinary Manner for three Days, on which he is weighed, and receives Presents from his Nobles. He had seven Thrones, extremely rich; one was begun by Tamerlane, and finished 200 years after, which is valued at 60 Mill. of Crowns. But in what Condition that Treasure is, since the Conquest of that Country by *Kouli Kan*, in 1739, who made Spoil of the immense Treasure the Moguls had heaped up for many Years, Time must discover. The Mogul's Courtiers are most of them of mean Extraction, he who was a little while ago a Coachman, or a Porter, is now a great Minister of State. The Laws throughout the Land are very severe against Offenders, and the Execution of a Criminal is not performed by a Hang-man, but by Elephants, who have learned either to hasten or to slacken the Death of the Malefactor."

That the regal splendour of the Mogul was of the most magnificent description, no one who has ever dipped into the history of India during the period preceding the advent of "John Kumpanee," as the natives called the chartered adventurers, can for a moment doubt, but to accept as facts the figures just quoted, demands a Cowleyan gullibility such as is rarely found to-day, many though there be who, eyes agog and mouth agape, go to and fro upon the earth, believing in "dreams and signs and lying wonders."

In describing the inhabitants of two kingdoms in the "*Peninsula on the other side of the River* GANGES," Mr. Cowley informs us that in one of these "the Men have large Crops on their Throats," and that in another, "the Women have Crops on their Throats." One may be pardoned perhaps, for just a little doubt as to what the "Crops" referred to were. Were they merely an abnormal development of what is commonly known as "Adam's apple," or was it endemic goitre? It is well known that in many of the Swiss cantons goitre or thick-neck is the rule, but we can hardly conceive of similar climatic causes existing in countries so widely different in almost every respect as are Siam and the Alpine region.

Reaching China, we can readily excuse the "Geographer to His Majesty," or any other geographer, for not being able to tell us a great deal in the year of grace 1742; but knowing how prone our author is to draw upon "his imagination for his facts," it is not a little surprising to find him simply stating that the inhabitants of the Great Central Flowery Kingdom "are pretty white, and have black Hair. The Women are small, but extremely beautiful. The People are in general very courteous and civil to Strangers, but they must either continue there for life or depart quickly. It is computed that the number of souls amounts to 70 millions. They are chiefly divided into three Sects: the First are the Followers of Confucius's Doctrine, who taught the Observation of the Law of Nature, as the greatest Felicity Man can enjoy. They worship one God, and believe that the World did exist from Eternity. The Second Sect hold a Plurality of Worlds, and the Pythagorian Principles of Transmigration. The Third Sect are Idolaters, and addicted to Necromancy."

This is a fair statement considering the time in which it was written, and one is particularly pleased to notice that no self-righteous vituperation is showered upon the head of the great

Chinese Reformer, Kong-foo-tsee, who taught the golden rule to the Celestials five hundred years before their western brethren, the "outside barbarians," had ceased to demand "an eye for an eye, and a tooth for a tooth." Had Japan tea been an article of consumption in England when Mr. Cowley was engaged in translating our geography out of High Dutch, it would be easy to imagine him chuckling heartily as he got off this sentence, "In Osacko is a Temple of a magnificent structure, wherein they worship the Devil." His opinion of the "Japs" at large is a very poor one. He says, "They are gross Idolaters, and have several Idols, but among the Rest at *Meaco*, in a stately Temple, is one of gilt Copper, whose Chair is seventy foot high, and eighty broad; his Head is big enough to hold fifteen Men, and his Thumb is forty Inches round; the Rest of the Body is proportionable. The Bonzes or Priests are the greatest Cheats and Villains in the World. They will borrow Money of People and give them for it promissory Notes payable in the other World. They foretell Fire when they themselves are the Incendiaries, to have an opportunity for Plunder."

The system of long credit alluded to here, does not seem to have become naturalized anywhere else out of Japan, although the foretelling of fire is now quite fashionable over pretty much all the world, and with the same object in view.

If we now direct our attention to Africa for a short time, our readings from the remarkable volume before us will speedily come to a conclusion. As only within the last twenty-five or thirty years has much information of a really reliable kind been furnished to us relating to "the Dark Continent," it need be no matter of surprise if we meet with a few statements that recent exploration has done nothing at all to verify. A glance at the map introduces us to a number of countries whose names are not familiar to us of to-day, and it is more than doubtful whether some of the names referred to ever existed elsewhere than in European geographies. Take for example, Biledulgerid, which is located between the Barbary States and the "Desart of Zaara," Monocmugi, in that region traversed by the Zambesi and Monomotapa, occupying the district which all who have read Livingstone's travels will recognize as the Bechuana and Makololo region.

Speaking of Zaara, or the "Desart," we cannot help feeling something like astonishment when Mr. Cowley tells us that "it contains ten Kingdoms," the names of which are all given, and no doubt correctly spelt, but we are fairly puzzled when we read what he says of the "People who inhabit this Desart." "The Natives are undaunted, and will not only face but engage with a Lion whenever they meet one, which they frequently do." Now, in case the reader should suppose that the natives made a business of facing lions and engaging with them, it is explained that "their chief Occupation is looking after Camels." The way the lions and camels enjoyed themselves in these ten desert kingdoms may be gathered from the description of the country itself. "The Southern Part of this Country is full of Sand, the Middle full of Stones, and Eastwards it is full of Morasses." Happy lions, happy camels! To avoid any appearance of rudeness to the Zaaraites, let us just quote a sentence to make their religious condition perfectly understandable. "*Mahometanism* is introduced and practised in all parts of this Country, but the Inhabitants for the generality live without any Religion at all."(!) This might perhaps be called a *meetapheesical* proposition.

Should the ghost of the Geographer

Royal ever revisit "the glimpses of the moon," it might find some difficulty in realizing (if ghosts can realize) how Cowley in the flesh could speak in 1742 so boastfully of the part played by the English in that most devilish of all traffics, the trade in fellow-creatures. Says he, treating of Nigritia, "The Negro Trade is in this Country of great Consequence. The English have in a Manner monopolized it, and transport great Numbers of them to their Plantations in the West Indies." On the supposition, however, that any of the captured darkies were of the blood-royal in Benin, they might have regarded their deportation as a real god-send, for we read that in this country, "The King keeps 1,000 Wives. Out of the Sons he has by them, the Number of which commonly is very large, he nominates one for his Successor, but the rest of his Brethren are obliged to go and hang themselves." It was, perhaps, in view of a similar condition of affairs elsewhere, that there originated the beautiful though brief prayer, "Oh, king, live forever!" Who knows, indeed, that the burden of our own national anthem may not be traced to some such source?

The capital of our empire, according to the work before us, would only make a fair suburb of "*Cairo*, or *Grand Cairo*, which is not only the largest City in *Egypt*, but in the whole World. . . . . It is 48 Miles in Circumference; it has 24,000 Streets, and almost as many Mosques. The Number of Inhabitants are reckoned to be seven Millions. . . ." As Steven Van Brammelendam, of Amsterdam, would say "they must have been a very *churchical* people."

Woorali poison, so much talked of during recent times, would seem to have been fully equalled a hundred and fifty years ago, in Nubia, for "This Country produces a subtile and incurable Poison, one Grain of which is able to kill ten Men in half an Hour; an Ounce is sold for 100 Ducats." In the presence of such a fearfully virulent toxicant, one can only feel thankful that the price was so high, and that in Nubia ducats were probably of rare occurrence.

When we reach Abyssinia, it is an agreeable disappointment to find our authority an unbeliever in Prester John, and actually informing us that "according to the modern Accounts this was only a Chimæra, the Inhabitants not having known, or so much as heard of, that Name." After reading such a demurrer we can more readily believe that the Abyssinians possessed two fine libraries, and that one of these at Axum contained "Manuscripts of *Enoch*, *Abraham*, *Solomon*, and *Esdras*, written with their own Hands."

"Of the Kingdom of Monomugi" it may assist us in fixing the locality to know that "the famous Mountains of the Moon are not far from it," and it was presumably in the neighbourhood of the said mountains that the "Dragons and other wild Creatures which abound in this Country" found a retreat. "The People in General are Idolators," says Mr. Cowley, which is scarcely more astonishing than if he said they were lunatics.

When describing the empire of Monomotopa, with its "30 Kingdoms," the translator remarks "it would be to little Purpose to enumerate all their Names," and here, for the first time, we fully agree with him. The capital, he says, "is built of Stone, two Stories high, for which it is admired by all the rest of the Nation; no other Town is built like it, the Houses being mere Huts, patched up with Wood and Clay. . . . The Apartments of the Emperor's Palace are furnished with the finest Tapestries and Ivory Branches, which are hung up by Chains of Gold. . . . The Emperor governs with an Abso-

lute Power, and whoever is admitted to an Audience must appear before him on his Knees; according to Accounts of Travellers, when he sneezes or drinks, all his Attendants greet him with a loud Voice, which is directly conveyed from one Place to another and resounds through the whole City. He has 1,000 beautiful Wives. She who is the Mother of the first-born Son is looked upon as Queen. The Emperor's Body Guard consists of 12,000 strong and courageous Women, and 200 Dogs." It not being impossible that this statement of facts has a bearing upon the ancestry of Ketchewayo, we feel like exclaiming with one of old, "How are the mighty fallen!"

As it is well-known that owing to the absurdly extravagant outlay incurred in connection with modern burials, societies have been organized in several places for the purpose of reforming the fashion and reducing the expenditure, the following quotation may go to shew that long, long ago, the natives of the Congo country were even more radical in their views upon the point in question than the economists of our own time. Listen: "It is said that the Natives are Cannibals, who devour commonly their first-born Children, and will kill and eat their Parents. Whoever dies a natural Death is eaten by their Kindred and Relations, so that in this Nation People save the Expenses of a Funeral." But this is not all. The French *canard* story, which, by the way, has furnished our language with a new word, is completely outdone by what follows: "The King's Residence is Monsol, where they sell Men's Flesh in the open Market, and . . . they kill daily 200 Men for the King's Table, which are either Criminals, Prisoners, or Slaves; and this is not done on Account of Scarcity of other Meat, of which they have Plenty, but because Human Flesh is looked upon as a delicious Dish." One is apt to wonder here, how long the supply would be equal to the demand, and whether this truly National Policy of Congo for the Congoese, or, which is nearly the same thing, the Congoese for Congo, was a good one for the Congoese themselves. Another query also presents itself, was the Congo N.P. really *protective?* But this we may leave for discussion to political economists.

With a peep at the African Islands our paper will close. Taking the Canary group first, we read that "In the Island *Ferro* is *Santi*, a wonderful Tree, 40 foot high, 12 foot thick, and 120 foot round; it is green throughout the Year, and bears a sweet Fruit, like Acorns. Upon this Tree rests a Cloud, which drops daily for two Hours the finest and sweetest Water, of which the Inhabitants may gather 30 Barrels a Day, and this is all the fresh Water they are supplied with in the whole Island. In the Island *Teneriff* is *Pico*, the highest Hill in the World. Its height is 20,274 foot. The Middle is covered with a Cloud, and the Top with Snow, it may be seen at Sea 240 Miles off." The verification of the last statement, *i.e.*, as to the distance a mountain of such a height might be seen from the sea, will, no doubt, prove an interesting exercise to budding mathematicians. The tree story may be left for the consideration of Dr. Hooker.

If Abbott's Life of Napoleon may be trusted, the Little Corporal would hardly agree with Mr. Cowley when he states that "The Air of St. Helena is very wholesome, and People that are taken sick at Sea, at their Arrival there, soon recover." St. Helena, be it remarked, is not the only Island in the world, a residence on which is sure cure for those "that are taken sick at Sea," there are thousands of others; besides it may be urged that Napoleon's illness was not of the na-

ture of *mal-de-mer*, notwithstanding it was contracted at *Water*loo!

In answer to the question "What are the people of Madagascar?" we have this reply: "There are several Sorts of Natives on this Island. In the Woods live many that are wild, go quite naked, and have frightful Beards. Those that live in Houses build them in such a Manner as they can carry them on their Backs wherever they please. The better Sort wear Cloaths; the Poor go naked, except the Women, who most of them go covered."

The ability to take up one's bed and walk ceases hereafter to contain much matter for wonder, and it is deeply to be regretted that after having our curiosity whetted in such a way that Mr. Cowley should not have told us a little more, say, as to the size, quality and construction of these portable Malagasay edifices, and whether they appertained to "the better Sort" who wore "Cloaths," or to "the Poor who went naked." That the geographer himself fully believed in all that his volume contained there can be no reasonable doubt, for if we turn once more to the preface, we find him most bitterly denouncing the "many gross and very material Errors" contained in another translation, which he says had "lately come out" affirming it to be so erroneous in almost every respect that it was "calculated only for the Use of Children!" "But," he continues, "this *New Introduction to the Study of Geography* is adapted to the capacity of all Ages and Conditions of both Sexes, and sufficient for the Instruction of any Person in this Science, as far as is requisite with respect to reading any History whatsoever, or bearing a Part in Publick Conversation. . . . I flatter myself no Book of the like kind hitherto extant will better answer the End proposed, or prove more acceptable to the Publick."

THE STUDY OF WORDS.*

BY T. O'HAGAN, HEAD MASTER SEPARATE SCHOOL, BELLEVILLE.

IF one of our pupils while coming from school were hailed on the street with: Say, boy, what do you read in school? he could well reply, as Hamlet did to Polonius, "words, words, words." It matters not where you cast your eyes on the school curriculum of studies, a subject fraught with the study of words immediately greets you. In the elementary division of the school the child lisps words; they are play toys to him in his younger days, and stubborn facts to him as he grows older. In the solution of a geometrical problem they play about every angle; in the translation of Greek and Latin authors the pupil calls regiments of words to his aid, and as he moves along the glassy tide of English prose and poetry his bark is propelled by a swift current of words. *In a word* his whole study is made up of one great season of words: a morn adorned by the simple and verbal landscape of childhood; a noon clad with the garb of glowing thought; an eventide garmented with the grave dress of meditation and reflection. In every sphere of life we are required to keep an armoury of words, but in few is their study of more absolute necessity than in the profession of teaching. Perhaps you may ask me, Why is this? The reason I think is

* A paper read before the South Hastings Teachers' Association.

very obvious. The teacher is called upon imperatively, if he be a real teacher, to open up to his pupils new horizons of thought, and this he can do but very imperfectly if he possess not a fund of words. For what are words but the signs of ideas, and what are ideas but the offspring of the mind; how then can the mind of the teacher hold converse with the collective mind of his pupils if there be no channel of communication between them. You might as well endeavour to empty the contents of one bottle into another without first taking out the cork. True, I am now speaking more especially of instruction, but the same remark will equally apply to education. You cannot expect to confront your pupils with questions which will develop their reasoning faculties unless you put your questions in a sensible and reasonable shape, and this I maintain you cannot do if you are continually suffering from a famine of words. But here you may say that school is not the place for a display of grandiloquent language. True enough, nor is any sphere in life suitable for such an exhibition of verbal balloon ascensions, where the speaker taking the place of the aeronaut is lifted up by gas at the danger of being suddenly impaled upon some house top, a spectacle to angels and to men. But aside from jesting, the study of words is of absolute necessity for both teacher and pupil. A great deal is often said about the difficulty of teaching composition. The greatest barrier I verily believe to progress in this subject is the combined lack of the true import and value of words on the part of both teacher and pupil. Give a scholar a supply of useful and common words and it is surprising how readily he will write for you a short theme. In connection with this point I might say that an excellent habit has been inculcated in the schools of this district,—I believe by our Inspector, Mr. Johnston,—I refer to the practice of calling upon the pupils to substitute other words for many of the important ones which occur in the different passages of the reading lesson. This I consider to be a very key to the study of composition, and will do more to facilitate a pupil's progress in this subject than all the abstract themes you may fling at him from now until doomsday. The study of words and the subject of composition are so closely connected that I cannot refrain from throwing out a few suggestions on methods of teaching the latter. I must say that I really pity a young boy or girl dismissed from school in the evening with the benediction of an abstract subject lying flat across his or her brain to be worked into a web of composition and laid at the feet of the teacher next day. I call such an exaction on the part of teachers the very keenest torture, very nearly akin to the torture in which Domitian, the Roman Emperor, took so much pleasure—that of piercing flies with a bare bodkin. How many of us, I ask, could even define some of the subjects which are given by teachers to their pupils? Take, for instance, the word "duty." Why, you could define it in twelve different ways, and then you have not one side of the square. But of course pupils, forsooth, are expected to do what the teacher himself cannot do, and hence the generosity of the teacher in placing his pupils sometimes for a period of three days in these torturing stocks of composition. Composition, did I say? It is a misnomer, rather call it imposition. I have from time to time seen samples of these compositions, and scripturally speaking, they resembled nothing that is under the earth, in the sea, or upon the earth. True, you could discover a slight resemblance in them to copies of the Magna Charta, signed by King John at Runnymede, but the change

which the English language has undergone since that time would even dismiss this resemblance from your mind. But here you may ask, How would you teach composition? I say teach it on the principle of imparting language. Give your pupils a small magazine of words which they can use at will. The child ten months old is encouraged to walk by holding out to it the tip of your finger; how then can you expect your pupils of ten years of age to make an attempt to walk in literary composition unless you hold out to them a helping hand. The two great drawbacks to composition are abstract subjects and the want of fit and proper words to express ideas; the great aids to composition are the study of words and the composing of plain and narrative themes. With the object, therefore, of facilitating the progress of the pupil in so important a subject, the teacher should demand of his pupils a written account of some interesting story which he has just read, say a couple of times. He will require to read it at least twice, as the memory of many a pupil is not at all tenacious. And, mark you, he reads for a double purpose, that of giving his pupils a clear conception of the story and as much of the language as possible, which the author has used. Many of the lessons in our Third Reader would suit admirably as subjects for composition. Take for instance the lesson of Female Heroism; it is a beautiful and spirited theme, and would do well as a subject of composition even for pupils in advanced classes. This method followed up with a little care by the teacher in the correction of composition will, in a very short time, shew results that will give an encouragement to the study of this much neglected subject, and make of it a pleasure—not a task. Just as sure as this earth rolls through space, so sure will the young man or woman who neglects composition till he or she has reached the age of eighteen or twenty ever remain at the very portal of the great hall that winds through so many chambers of treasured literature. You may read a thousand books from cover to cover, con over the pages of our brighest novels by the cubic foot, but you are still no artist in literature, for you have never attempted to throw on canvas the thoughts of your own soul. But you may say, We have no time to teach this subject in our schools. No time for a subject that has for its purpose the painting in language of the thoughts of the soul? No time for a subject which so largely fills the sphere of every-day life? No time for a subject, the study of which is alike necessary for the man professional and the man commercial? Yes, there must indeed be time found for the study of so noble a subject. The platform demands for it a place in the school curriculum; the bar pleads for it; while the pulpit exhorts and entreats in its behalf. Every revolution of the earth is bringing the world into more practical form, and sooner or later the ornamental must give way to what is necessary. What would you think of a man who, when called upon to discuss some grave and important subject, excused himself on the grounds of having studied only mathematics in his youth, but generously offered to substitute in place of an address a new and elegant proof of the Eighth Proposition in the First Book of Euclid. Still you would be disposed to laugh no more at such an occurrence than you would at the action of a young lady who, on having received an invitation to dine with a friend, knew not how to acknowledge its receipt, and sent as a substitute for a reply a beautiful diagram of the bones of the head. Not more foolish are these than the teachers who, in the school room, are using powder to shoot off cartridges into the space of a circle

of subjects, which play no part in the practical usefulness of after life. But perhaps you will say that the study of words and the study of composition will not develop the reasoning powers; if so, you are greatly mistaken. No other study will tend to whet your mind to so discriminating a point as that of the study of words. What game requires the reasoning faculties to be on the alert so much as chess? Yet the study of composition is nothing more than a game of literary chess, in which the single shifting of a word may undo the whole game of sense. But enough about the study of composition. Let me now turn to the derivation and origin of words. There is no language that requires the same digging and delving in order to reach the first strata as the English. Like the nation, which has derived its strength from so many sources, our language partakes of the healthy origin of our people, and flows in one grand and mighty tide, fed by a band of streams, the fountain heads of which are hidden among the rugged wilds of the past, and as they sound down the valleys of time, bright accents of peace and pæans of progress sweep o'er their bosoms with such majestic melody that they noiselessly blend with the measureless notes that play upon the great ocean of eternity. Yes, Briton and Roman, Saxon and Dane, Angle and Norman, hold notes in the great bank of the English language. As you put your hand in to draw in this great lottery of language, you may bring to the surface a word which had birth by the boiling springs of Iceland, or perhaps was nurtured amid the vine-clad hills of Spain. It is this composite character that makes the English language superior to all others; for we have in it a portion of the depth of the German, the gaiety of the French, the majesty of the Spanish, the nobility of the Greek and the softness of the Italian. We are indeed proud of our English language, for it is no quilt patchwork, but a blending of all the beautiful colours in the many languages of the world. I cannot expect in this essay to go into the philosophy of language or shew the diversity which characterizes the English tongue as spoken in different ages; such a disquisition would require a paper in itself. It may, however, be safely stated that the English language as spoken today began to take shape and form about the thirteenth century, or coeval with that period when Macaulay says the English nation began to take shape and form. We know that during the Norman period French was largely spoken in England, and hence nearly four-fifths of the foreign words in the English language can be traced to the French, which makes it difficult at times to determine whether a word has been taken from the Latin through the French or directly from the Latin. After the French Provinces had been wrested from the feeble hands of King John, the Norman of England fought against the Norman of France, and then it was that the English language, with the English nation, began to evolve. But perhaps you may ask me what are the chief causes of the diversity of languages. There are three grand causes. 1st. Difference of occupation; the vocabulary of a shepherd must differ from that of a mariner. 2nd. Difference of improvement in sciences and the arts of life. 3rd. Difference of climate by bringing different classes of objects before the mind. Another cause of diversity in language is as the distinguished philosopher, William Von Humboldt, says, "that no one assigns precisely the same meaning to a word which another does, and a shade of meaning, be it ever so slight, ripples on like a circle in the water through the entirety of lan-

guage. And now as to the percentage of Saxon words in our language. It may be interesting to note that sixty per cent. of the words in Shakspeare are Anglo-Saxon. In the sixth book of Milton's Paradise Lost four-fifths of all the words are Saxon. In many of the other books, however, there is a large percentage of foreign words. Let us take the following extract from Paradise Lost and analyse the words in it:

> High on a throne of royal state, which far
> Outshone the wealth of Ormus or of Ind,
> Or where the gorgeous East, with richest hand,
> Showers on her Kings barbaric pearl and gold,
> Satan exalted sat, by merit raised
> To that bad eminence.

Here we have state, exalted, eminence, and merit from the Latin; throne, richest and royal from the French; barbaric, Ormus and Ind from the Greek; Satan from the Hebrew; while the remainder is Anglo-Saxon. With such a gathering of words from the four winds of heaven, how need we ever expect to understand the English language without paying attention minutely to the derivation of words. Besides, the English language has bound up within it the history of thought, for language is the very incarnation of thought, and it will be therefore through the channels of language that we must course our way along the arteries which have fed and succoured for so many centuries the great English nation. So potent are words that very often a single expression may give you a key to the character of a whole people. Dickens says that the English and the American nations are mirrored in the two expressions "All right!" and "Go ahead!" In a language, too, may be seen the Government, religion, arts, moral sentiments and social life of a people. In fact language is a very key to the heart of a people, and if you would know their heart you must learn their language.

But this essay has already grown long. Let me then hasten and say something having immediate bearing upon the derivation of words. It will be readily perceived that to understand the true import of a word you must first know whence it originated. To know whether a word is of French, Latin or Saxon parentage we can be guided but little by its sound. I remember in my school days that I thought there was something in the sound of a word, and therefore when the teacher asked me one time to give the root of *hippopotamus*, I very readily answered *hippos* a hip and *potamus* a pot. I need not add that the teacher would not accept this. Many of our English words have Saxon roots which contain in them the original meaning of the words. Thus woman is the *wif* or *webman* who stays at home to spin—probably to spin yarns; while the root of man has attached to it several meanings, amongst them that of sinful. Lady primarily signified breadkeeper, from the Saxon *hlaf* bread and *weardian* to look after. We can readily understand in this way why Alfred the Great, not being a lady, allowed the cakes to burn. A very significant derivation is that of girl. Trench speaks of an eminent philologist who deduced girl from *garrula*, girls being commonly talkative. This is not more unkind than the tracing of virgin to *vir* a man and *gin* a trap. The word news is supposed to be derived from the first letters of the four points of the compass, north, east, west, and south. Philologists differ as to the derivation of the word foolscap. Some consider it to be a corruption of the Italian *foglio capo*, a full sized sheet of paper, while we have good authority for saying that the word originated with Charles II., King of England, who

when the page brought him some large writing paper that had been used in the reign of Cromwell and contained the stamp of a little cap in one corner, replied, "Take away that foolscap." The word humbug, too, is of doubtful origin. A very ingenious explanation of this word is that it is derived from Hume of the Bog, a Scotch laird who lived during the reigns of William and Anne. He was celebrated for telling marvellous stories, hence a tough story was called Hume of the Bog, which, contracted, gave humbug. Another etymologist derives it from the city of Hamburg, in Germany. We find also in studying words that the meaning now assigned to many of them is not in accordance with their primary acceptation. The word "animosity" is an example of this. Formerly the word meant spiritedness. It is now, however, only applied to a vigour in enemity and hate. The young man out west was not, after all, very greatly mistaken when he replied to the young lady sitting by his side at tea that in compliance with her request he would pass the cakes, "with the greatest of animosity." There are words, also, peculiar to different countries in which the English language is spoken, and these may be classed under the head of Englishisms, Americanisms, etc. A good story is told of Mrs. ex-President Grant, when visiting the Queen of Greece, which well illustrates this. Mrs. Grant had heard that the Queen was well versed in the English language, but expressed her disappointment to the ex-President, adding that when in conversation she had used the word "skedaddled" the Queen seemed completely lost. But enough of this.

Let me close by saying something upon the dignity and nobility of words. Language is merely the art gallery of the soul. See to it, then, that you decorate your schoolrooms with the most beautiful word pictures —paintings of the inward greatness of your lives. Every word you utter leaves its photograph upon the minds of your pupils; every word you utter will go sounding down the aisles of eternity. Oh! how sweet are some words, how beautiful in their winged flight, as they course their way to gild the portals of eternity. Behold the two guardian angels that stand by our side as we pronounce the words "home" and "mother." As we utter these words peace seems to throw her arms around our neck and kiss the dew-drops from our eyes. Yes, we have truly a noble language. It is the language which binds us to the throne of heaven, the language of the dearest and holiest relationships of life, the language of the maternal lips which have blessed us and are perhaps now silent in the grave. "The language," says an eminent writer, "of our sorrows and our joys; our aspirations and our regrets; the language in which we breathe our consolations to the dying and our farewells to those whom we love; the language in which are embalmed the stirring appeals of our patriots and the thrilling battle cries of our warriors; the language of our funeral dirges over those who have fallen in defence of our homes and our liberties." O great and mighty language, I salute thee. Thy echoes are caught up in the sphere of immortality; the sweetness of thy soul floats on seraphic wings to blend with the hosannas that will fill forever the angelic mansions of an eternal hereafter!

PRACTICAL IDEAS OF ENGLISH GRAMMAR.*

BY A. STEVENSON, HIGH SCHOOL, WELLAND.

ENGLISH GRAMMAR is defined to be the art of speaking and writing the English language with propriety. The question at once arises, "What constitutes propriety in this respect?" There is a great diversity of opinion between those who profess to expound the science, and others who actually practise the art of English Grammar. It is affirmed by lexicographers and grammarians that certain words and expressions constitute the English Language. On the other hand many of these, the great mass of the nation, have never heard, and express their ideas in a manner quite at variance with the established rules of the grammarians. If, in the republic of letters, one man's word is as good as another's (and who will maintain that it is not?), then the speech of the people is certainly the speech of the nation. The chief cause of the great difference between the language of the unlearned and that of the learned is the presistent adherence of the latter to the languages of Greece and Rome as an infallible standard by which to regulate ours. As well expect us to regulate our dress, our food, our manners and our religion by these much-worshipped models. Many classical scholars have been so carried away by the beauties of these tongues, some of which are real but most of them fancied, that they have forgotten that classical grammar did not produce classical language, but was deduced from it, and thus they have foolishly endeavoured to bring the free and independent tongue of our Saxon forefathers into an unnatural bondage. This absurd idea was so far carried out that it is only about sixty years since most of the so-called English grammars were written in the Latin language, and contained, word for word, many of the rules of the grammar of that tongue. Now, any word or expression that conveys a definite and reasonable idea to the minds of a majority of the people of any nation has certainly a right to a recognized position in the language of that nation. Thus, if it is correct Latin to say, It is I, it does not follow by any means that it is incorrect English to say, It is me. The French in fact do use the latter expression because they do not regard themselves as tied to the leading strings of Latin or any other tongue. In orthoepy we are not at all guided by the Latins. Take for instance our common words bonus and colour which it is generally admitted the Latins called bōnus and cŏlor. When we are not subject to Latin laws in the case of *words* adopted from that language, why should we be governed by those laws in expressions which are purely Anglo-Saxon? that is to say, if Latin does not govern English orthoepy, why should it govern English syntax? In addition to the disagreement that we have just noticed,

* This paper is published at the request of the Welland County Teachers' Association, before which it was read.

it may be further observed that an expression used by some good writers is tabooed by others, and the standard word of one century is the barbarism of the next. It will be readily admitted, then, that the terms "correct" and "incorrect" as applied to the English language are merely conventional and relative, and not absolute, in their signification.

It is probably well that we should set up a certain comparatively fixed national standard in our language, or a very short time would suffice to render the speech of the people of one part of the realm quite unintelligible to those of another, and such an event would materially hasten national decay and the disintegration of the empire. Yet this standard should be placed at a medium elevation. For a word that is in more common use among the lower classes is not necessarily vulgar, and the fact that an expression is current among the higher circles of society does not vouch for its propriety. Assuming, however, as is done at the present time, that the standard of correctness is the most approved usage of the best writers and speakers, we shall proceed to notice some instances in which that standard is not adhered to. Most of the corruptions of language prevalent in Canada had their origin in the United States, some have come from the old countries, and a few we ourselves have originated. That distaste for old institutions, and that reckless introduction of novelties which characterize our neighbours so prominently in politics, have shewn themselves also in literature. They are ever ready to debase the pronunciation of words or to destroy it entirely, to discard old words and expressions and to adopt new ones. Consequently, not only has the language of their own country become corrupted but these corruptions have spread to Canada. On all sides, from speakers and from readers, from the educated as well as from the ignorant, we hear "off" and "uf" and "uv" for "of;" "bĭn" and "bēn" for "been;" "ur," "nur" and "fur," instead of "or," "nor" and "for;" "dooty" and "constitootion" for "duty" and "constitution;" "Latin" is "Latun," and "solid" is "solud." "Spirit" becomes "speerit" or "spurit;" "goodness" becomes "goodnuss;" "mercy;" "murcy;" "justice," "justuce;" and "prudence" is "prudunce." "Length" is "lenth," and "height" is "highth." "A book" is called "ā book," "the hat" becomes "thē hat," and so on *ad nauseam*. That no one may think this picture overdrawn, let him listen attentively to ordinary conversation for half an hour, let him be present while a class is engaged in reading in most of the public or high schools in this Province, and to go further, let him observe the ordinary pronunciation of many of our University graduates. This ignorance of correct pronunciation is not to be wondered at if we consider the system of education adopted in our country. Of the famous "three R's," once considered so essential to all systems of education, two are now almost entirely neglected, and either of these is of greater importance to a very large majority of people than the third. In the higher classes of too many of our public schools, reading is taught imperfectly or not at all, because proficiency in this subject meets no recognition on examinations for entrance into the high schools. In the high schools, reading is frequently crowded out of the course to make room for Classics or Mathematics, simply because these will pass pupils on the Intermediate and Matriculation examinations. In our Universities, there are Professors of Latin, and Greek, and French, and German, and Hebrew, who know to a nicety

the sound of any word in these languages, and are ready to prove beyond the shadow of a doubt that Cicero was not Cicero at all but Kikero; the English Professors, however, do not deign to notice such matters as English pronunciation, although they can talk by the hour about the archaic tenses of the Saxon verb and the obsolete cases of Saxon nouns.

Purity of style and of expression in language are very greatly and injuriously affected by illiterate newspaper editors and correspondents. Anxious to appear learned, they aspire to a heavy, laboured style in the most trivial matters, while in articles on more serious subjects they frequently descend to the veriest slang of the streets. In the language of newspapers, and of those persons who read nothing better than newspapers, a man never goes home but "an individual proceeds towards his residence;" every man is a "gent" or a "gentleman;" a woman is a "lady," or a "female," or a "young person;" a child is a "juvenile;" and children are the "the rising generation." When Mr. Jones falls in love he "becomes a victim to the tender passion;" when he marries he "is united in the holy bonds of matrimony." Mrs. Jones is not now his wife, but "his lady." The worthy couple do not live in rooms in a certain place but they "occupy apartments in a certain locality." Mr. Jones never mentions his business, he merely "alludes to his avocation." It soon becomes known, not that our friend is a Methodist, but that he is a "member of the Methodist persuasion." Mr. Jones becomes ill, and his friends tell us that he is "seriously indisposed." When Mr. Jones dies, he "takes his departure from our midst," whatever that means. His widow does not feel the loss, for we are told that she "sustains a bereavement." No longer the body, but the "mortal remains" of our late lamented friend, are put into a "casket," not a coffin, remember, and "the cortege proceeds to the cemetery." To the disgrace of humanity Mr. Jones is not even now decently buried, but he is "consigned to the cold and silent tomb." These expressions are for the most part bombastic and pedantic, and appear ridiculous to the last degree in the connections in which they are commonly found. Another feature worthy of observation is this, that several words, unnecessary and essentially vulgar, have obtained a footing in our language. We can account for this only by the fact that of late years many publishers of dictionaries have shewn a morbid anxiety to be in a position to say that they have *so* many new words in their books not found in any other. Hence they introduce words on the authority of a single writer of magazine articles or of popular romances, and we are afflicted with such novelties as "materialistic," "experimentalize" and "controversialist." Webster's Dictionary is especially remarkable for its "new" words which are anything but a favourable characteristic of that work. "Underhanded" has been introduced into Worcester on the sole authority of Smart. There are two charges against this word, either of which should banish it from our language. It is unnecessary, since its place is filled by the word underhand; it is formed on a false analogy, the participial or adjective termination "ed" being added to an adjective. Why not "beforehanded," if we allow "underhanded?" A reason similar to the first might be urged against the adoption of lēnience, lēniency, preventative, rotatory, donate, firstly, and many others. Numerous words, good enough in themselves, have been put to improper uses. Thus the word "couple" denotes any two objects fastened together or connected in some way, and any two not connected are virtually not a couple. Hence the error in the expressions, a "couple" of

days, a "couple" of dollars, etc. "Either," "neither," and "both" are often improperly used when reference is made to more than two objects. And here let us observe the superfine affectation that would introduce the pronunciations ïther and nïther. Good usage and euphony are both against them. There is nothing in their favour except novelty: that, however, with some persons is a strong recommendation. Dickens has perpetuated an egregious blunder in the expression, "Our Mutual Friend." Macaulay rightly calls this "a low vulgarism;" for mutual means reciprocal, or interchanged, and thus it is evident that friendship may be mutual, but friends never. But the height of absurdity is reached in the common expressions, "widow woman" and "widowlady." As well may we say "widower gentleman!" The phrase, "You are deceiving me," contains a contradiction. It cannot be deception that is practised on a person when he is conscious of it. The correct form is, "You are attempting to deceive me." This objection does not hold of course in the sentence, "You are deceiving him."

There is a snobbish vulgarism in the use of "drive" for "ride" in such sentences as, "The lady went for a *drive* in her coach." In these cases the coachman generally drives and the lady *rides*. Probably when she travels in a railway carriage or a steamboat she *drives* too! The common phrase, "I am mistaken," though it has been generally adopted, yet contains an absurdity. "To mistake" means to misapprehend, and if this expression means anything it means, "I am misapprehended," or, "I am misunderstood," which is something quite different to what we intend to convey by its use. Then there is the sentence, "I will do no more than I can help," that is, "I will do no more than that much which I can help doing," that is, "I will do what I can help doing," which is absurd.

As it has been already remarked, the rules and definitions of grammar are not absolute but relative and conventional. They depend very much on the manner in which the usages of the language have been reflected in the mind of this or that gentleman, who, fancying himself a master of the whole subject of language, proceeds to manufacture a new grammar or reconstruct an old one. On this account it is to be hoped that it will not be considered treasonable against the Queen's English if we examine the principles advanced and the definitions given by those who profess to be expounders of the fundamental laws of our language. We do not presume to be expositors of language; we but raise a protest against the errors made by those who do. We advance only the facts of language; for the fancies of grammarians we care nothing. These errors spring principally from three sources. In the first place, most of our grammarians either are ignorant of, or neglect the fact that grammar deals primarily and essentially with *words*, that is, with the expression of ideas in speech or in writing, and not with the ideas themselves or with the actual objects, qualities and actions that give rise to ideas. Thus when we say, "John runs," we call in the aid of grammar to express in a manner accordant with good usage the ideas contained in the statement. Grammar assigns a technical name to the word "John," and to the word "runs," and treats of the connection these words have with each other in this sentence. Grammar has nothing whatever to do with the anatomy of the man named John, nor with the philosophy of the action of running. This fact, so plain that the very statement of it is a truism, has been frequently ignored by persons who are called grammarians. In conversation on this subject with a University graduate of good standing, the writer of

this article received the astonishing information that he, the writer, was a *noun!* Many grammarians have made even a more ridiculous blunder in defining gender. They say, "Gender is the distinction of sex." Notwithstanding the number of authorities for this statement we hope we may be excused from believing that we are nouns or that words have sex. Again, most grammarians state that "an adjective limits, qualifies, or describes a noun," or use words to this effect. Now, a noun is a name, technically considered, and a name is a word, and in order that an adjective may limit, qualify, or describe a noun, it must limit, qualify, or describe a word. Thus, in the sentence, "Jane has a red rose," since the word "rose" is a noun and since the word "red" qualifies it therefore it follows that the *word* "rose" is red, which is absurd. Some grammarians, dissatisfied with the old definition, assert that an adjective qualifies the meaning of a noun. This, too, is incorrect. For, by the meaning of a noun they must intend us to understand the thing of which the noun is the name. But it is quite idle to talk about a word qualifying a thing, for we know that only things can qualify things. Thus when we add sugar to our tea, we say that the tea is modified or qualified by the sugar, and to express the condition brought about in connection with the article that is affected, we use the words "sweet tea." At once we see the absurdity of the affirmative that it is the adjective "sweet" and not the article, sugar, which modifies the article, tea. Mason and Morris, the English grammarians, now define an adjective to be a word used with a noun to distinguish or describe the thing spoken of, that is, they affirm that an adjective does not qualify a thing or the name of a thing, but that it merely *expresses* a quality or qualification of a thing. In a similar manner to the above may be shewn the utter worthlessness of the long-accepted definition of an adverb, which is asserted by grammarians, from Lindley Murray down, to be "a word that modifies verbs, adjectives and other adverbs." We quote a correct definition of this part of speech from Mason's grammar: "Adverbs are words which shew the conditions of time, place, manner, degree, cause, effect, etc., which modify or limit an action or attribute." It will readily be observed that a word, being an adverb, does not modify another word nor does it express a modification of a word, but of an action or attribute. In this connection let us remark the unqualified praise that has been bestowed by many worthy teachers on Lennie's Grammar. Those of us who have studied it will remember that noticeable features in that work were long lists of adverbs, prepositions, conjunctions, and interjections, which were to be committed to memory by the pupil. If a particle was met with in a parsing exercise which was not to be found in any of these lists, pupils were generally instructed by the teacher to call it an adverb. Here we observe that one of the excellencies of the English language, a quality in which it far exceeds any other language, is entirely lost sight of. We refer to the fact that any word may be, and is, used as any part of speech; that is, that the function of a word in a sentence has nothing whatever to do with the spelling. Yet we are all aware that students who diligently and intelligently studied Lennie became good practical grammarians. It was not, however, his definitions nor yet his lists that made them grammarians. No doubt it was his extensive and varied exercises on the criticism and proper construction of sentences. Such exercises we are sorry to say have been almost entirely neglected by modern grammarians, and the evils resulting from this omission are too

manifest. Here let us call attention to the utter uselessness, for all practical purposes, of much of the grammar that is taught in many of our schools. Pupils analyze, and parse, and define, and conjugate, for years, and then cannot speak or write five consecutive sentences without several grammatical blunders. The teacher who wishes to make his pupil practically a proficient grammarian will not burden his mind with senseless rules and worse definitions, but he will give him constant and careful instruction in essay writing, and in the correction and explanation of grammatical errors made by himself and others in ordinary conversation or in the class exercises. In addition to this he will give him a full acquaintance with practical etymology, and he will require him to devote much time to the critical study and memorizing of the choicest extracts from our best authors.

Let us now examine the definition of a conjunction given by many grammarians. They affirm that conjunctions connect sentences. They further affirm that the statement, "John and Jane study grammar," is equivalent to the two statements, "John studies grammar and Jane studies grammar." Here our grammarians add two words and change one, they "expand" the sentence as they call it, or in other words, they destroy the sentence given them, and construct two others to suit their fancy, and then they affirm with a flourish of trumpets that conjunctions do join sentences. To shew that this is a mere dogmatic assertion in the face of established facts, it is only necessary to change the predicate in our illustration, thus, "John and Jane are a handsome couple." Now, by the laws of the church and of society, John and Jane in this case are to be considered as one, though it has always been a disputed point, which one. It cannot, however, be disputed that John is not a handsome couple, neither is Jane. Mason asserts in Art. 287 of his Grammar that grammatical analysis has to deal with the expressions before us not with something else that we are told to substitute in their place. Yet in direct contradiction to this fundamental principle of grammar, we find him in Art. 537 declaring that before a contracted sentence is analysed the parts omitted must be expressed at full length, and accordingly he proceeds to express them in the manner indicated in our first illustration. Now it is evident that, in these cases at least, Mason has quite lost sight of the fact that the rules of grammar do not make our language, but that these are deduced from it, and that, too, as it is, and not as we may distort it, to agree with our falsely conceived theories. This trifling may be called Mason's Grammar, but we surely cannot dignify it with the title, English Grammar. No doubt it is the case, that, in the present state of the science of grammar, we are compelled in some sentences to resort to the miserable shift of changing or supplying words in order to give a so-called correct parsing of them. Unfortunately, this will continue to be the case until our grammarians learn to plan their text-books to conform to the language, and abandon the folly of attempting to make the language conform itself to their text-books.

The third great source of error in our grammars is found in the attempt to make distinctions where they no longer exist, and in the introduction of corresponding technical terms for which there is no place in modern English. Thus, we have the gerund, defined by Lilly to be a kind of verbal noun, used only in the oblique cases of the singular and governing cases like a verb. Then we have the gerundive which Goold Brown asserts is a participle governed

by a preposition and itself governing cases like a verb. Here we have the gerund to all intents and purposes equivalent to the gerundive, and that is said to be a kind of participle. But Max Muller, and after him Mason, calls this a gross mistake, and affirms that a gerund is not a participle at all. Then we have something or other ending in "ing," which some grammarians call a gerundial infinitive. In addition, we have what is known by way of distinction as the participle in "ing." So this delirious babble goes on and the result is nothing, practically nothing. Why not do as some American grammarians have done, enlarge the definition of the participle to include all forms of the verb that have a double function in a sentence, except the ordinary infinitive? There are three reasons why this plan has not yet been adopted by grammarians in Canada and England. It is modern and simple and it is of American origin! Further, it is generally acknowledged that there is in reality no inflection to indicate person in nouns, and a very slight inflection in verbs; that with a few exceptions there is no gender in nouns and only two cases; that there are only two tenses and two moods in verbs; and that the passive voice has only an imaginary existence in our language. Yet, notwithstanding all this, we allow ourselves to make a tacit admission of the correctness of the absurd distinctions made in these instances by grammarians. We hope the time is not far distant when English Grammar will be freed forever from those shackles with which pedantry and old-fogyism have burdened it.

TEACHING—INTELLECTUAL TRAINING.*

BY D. I. JOHNSTON, COBOURG.

HACKNEYED and commonplace though the subject may seem, it is one of those to the consideration of which it is vitally necessary that our attention should ever and anon be recalled. Just as it is well for the individual man to be constantly reminded of the main end and aim of his existence, so it is advisable for the members of any profession to be constantly reminded of the purpose which his profession is to serve in the body politic. Not only so, but so much are we surrounded in these days with an atmosphere of doubt and unbelief, and so strong are the attacks upon the fundamental articles of our faith and practice, that it is absolutely indispensable for every individual once and again to review the articles of his professional creed in order that he may anew intellectually grasp and practically live up to them. If this be true in any profession, emphatically is it so in ours. Surrounded as we are by systems innumerable, encompassed by methods, many of them estimable in themselves, though hampered with routine at every point, I have found from my own experience, and noticed in the experience of others, that we are extremely prone to forget the living germ, and fix our attention solely, or principally, upon its environments. No greater mistake can be made in life than for any one thus to mistake the *clothes* for the *man*, the *words* for the *idea*, the *how*

* An address delivered before the Northumberland Teachers' Association.

and *why* for the *what*. It is from the latter standpoint that I wish to consider this subject, and though I may present to you nothing new, yet if I can but enforce the well known and the real, my desire shall have been satisfied.

What, then, is Teaching? In its widest meaning I should be inclined to answer that it is the making of men and women; but in the narrower, more restricted, and technical sense in which the term is usually employed, it will be found to mean these two things: first, the giving of facilities for education, and second, intellectual training. We may consider the man with all his powers and faculties thoroughly trained as a perfect machine using the facilities provided him for the formation of his own character and the solution of the problems of life. Of the two, the latter is by far the most important, and to illustrate and explain the position taken let us examine briefly the subjects taught in our Schools and Colleges. When we give to our children the three R's, our object is not so much the training of intellect as the giving of facilities. The same remark holds good as regards the study of Geography, or History; it is true also in the study of all the Natural Sciences, and largely so in that of the Modern Languages. No one will deny that the study of the subjects mentioned may be used advantageously as a means of training the intellect, but it is not so much with that object in view, as to provide facilities by which the individual can the better hew his way in the warfare of life, that they are taken up. In the study of Language, as Grammar, in Algebra, Geometry, and the Higher Mathematics, in that of the Mental Sciences, and largely also in Classics, the main object is not so much the giving of such facilities as I have spoken of as the training of the intellect. Hence, it will be seen that the two-fold definition of teaching that I have given runs through all our practical work in School or College. The first part of the definition requires no further explanation, and is so generally recognized that I may safely pass to a more careful consideration of the second, and as I conceive more important, Intellectual Training. For the clearer understanding of our work here, suppose we divide the individual man into body, intellect, and spirit. It is the second part of the man—the intellect—that, in teaching, we aspire to train. And if we consider the intellect to comprise under certain aspects what the old Scotch metaphysicians loved to call "powers or faculties" we will be the better able to comprehend our work. The intellect then may be manifested in the faculties of *observation*, *memory*, *reasoning*, *judgment*, and *will*. The last more properly belongs to spirit and not to intellect, but enters as a factor into judgment. If a man wish to be a skilful oarsman he must by the exercise of his will bring his body under a thorough system of training, by long and careful practice; and in the same way must any powers or faculties of intellect be trained for success. In the first place then we have to train the *powers of observation* in the child. This lies at the threshold of all teaching, and yet, it is one of the very powers we too frequently fail to call into being. It is one of the faculties that is most required in the active business of life; it is absolutely necessary in such studies as Geography, or the Natural Sciences. A great deal more should be done in our schools, by the more extended use of the Kindergarten method of instruction in the shape of object lessons, to bring this faculty into play. Before any memory, reasoning, or judgment can be used, facts and phenomena must be noted, and the

more carefully and systematically this is done by the child the better is our elementary teaching. Again the *memory* is to be trained by constant exercise. This is too frequently forgotten by those who would have everything explained to the pupil before being learned by him. It is well that his reasoning powers should be early brought into exercise; but it is the bounden duty of the teacher to cause his pupil to memorise many things of which it may be years before he understands the reason, in order that the faculty of memory may be the more thoroughly trained. Again, the faculty of *reasoning* requires training by constant exercise. This is the faculty by which we systematize the facts and phenomena brought before it by observation and memory, in order to perceive the resemblances and differences between them, and analyze them to discover the laws which bind together the isolated phenomena into one grand whole. It is the exercise of this faculty that we properly call thought; and the teacher that can make his pupils think, has done something of which both he and society may well feel proud. No teacher can, in the true sense of the word, be called successful who does not thus awake into active being a creative intellect. Happy he who has the heaven-born power so to do, for then may he truly be called a co-worker with the Most High! But along with this honour comes the additional responsibility of seeing that the *faculty of judgment* is also at the same time duly developed. Thought divorced from action in the life of the individual becomes self-destructive, hence in the action of the intellect, reasoning and judgment should ever go hand-in-hand both "beating in one full pulse-life." It is here, as I have previously observed, that the *will* gives the determining power to the judgment. The formation of the judgment is largely due to the teacher, because the direction of the spirit in the region of will can be greatly influenced by him.

When any act is continually performed it becomes a habit; hence when any one of those faculties is constantly exercised in some given direction an intellectual habit is formed. It is the duty of the teacher not only to awaken and keep in exercise the faculties mentioned, but to see that they are used in the proper direction to form these habits. To illustrate and explain this, let a few of the more important be considered. In the first place there is the habit of *intellectual exactness*. An onlooker may consider the teacher punctilious who insists that his pupils shall acquire their lessons to the minutest word, or work their problems to the smallest fraction; but his judgment is a mistaken one, for it is by such means that the child acquires the habit just mentioned. Again there is the habit of *intellectual readiness*. This is something of great value in the varied departments of every-day life, and something which it requires all a teacher's care and all a student's anxiety for the latter thoroughly to master. It supposes that the facts of observation and memory are by frequent repetitions ready for use at a moment's notice, and that so well has the faculty of reasoning been exercised that points of similarity and difference in any question are almost instinctively recognized, and the judgment so invariably used that rapid decision follows on the heels of correct thought, which in its turn is founded on indisputable facts. This habit, judiciously cultivated, will frequently make up for deficient natural ability, and it is one which every conscientious teacher should strive to form in his pupils. "Time to think," as it is phrased, is frequently but a synonym for intellectual laziness, and prompt, decisive

answering should be the rule of every teacher. Again, there is the habit of *intellectual comprehension.* Though this is not wholly the result of training it may be largely developed thereby. It is absolutely necessary that the pupil master the details, but before beginning them he can be made to understand the general outline of the subject; his attention should be drawn to the completed edifice, its general architecture and beauties, as well as to the relation in which each part that has before been observed stands to every other in the formation of the structure. Many other habits there are, but I will only mention, lastly, that of *intellectual concentration.* This is one of the most valuable habits that can be formed, and its formation lies largely in the hands of the teacher. By fostering the interest of his pupils in every subject, by the clearest method of teaching it, by the strictest discipline which forces the scholars to pay the closest attention to the work of every minute in that minute, by enforcing prompt and active replies, and by ever throwing all the energy of his own intellect into the teaching of every subject, and the training and controlling of the active spirits around him, the teacher is producing in his pupil that habit which more than any other will enable him not only the more successfully to perform his duties as a citizen, but to make his mark as one of the guides and controllers of his fellow-men.

And now, in conclusion, I once more recall to your mind what I have ventured to call the essence of the work of our profession, in order that whatever may be our discussion, as to methods and systems, rules or regulations, laws or improvements, we may never forget that these are but the clothes and not the man, the means and not the end; that amid all routine the individuality of the teacher is the most powerful factor in teaching, and that the true product thereof is the number of well-trained intellects with systematized facilities that we send forth to take their place in the battle of life. That, and that alone, is our glory; and its resplendent lustre few other professions can equal, for, in the words of our greatest living thinker, "we are thereby made not only the benefactors of our race, but its creators too."

THE ARRAIGNMENT OF THE MINISTER OF EDUCATION.

BY AN OLD HEADMASTER.

A WELL-DRESSED but exceedingly wicked little boy the other day outraged the finer feelings of his nurse by deliberately wading through a muddy stream which irrigates a portion of the Queen's Park, Toronto. His neat knickerbockers were splashed all over; mud-stains covered his gorgeous stockings. When he had done this it might be thought he had done his worst, but no! he calmly proceeded to repeat the offence, waded back among the reeds in search it might be for green frogs, and came back as muddy as mud could make him. Which things are an allegory, setting forth not inaptly the proceedings of our present Minister of Education. He had gone pretty deep into the mire by his tolerating the Central Committee's abuses, and by his persistent ignoring of Canadian merit in all his promotions; he has gone deeper still by his late deliberate

insult to the University of Toronto, to Canadian scholarship, to the staff of Professors, and to all Canada.

The supporters of the EDUCATIONAL MONTHLY have reason to felicitate themselves on the fact that from these columns was fired the first shot in the war maintained with such spirit against the abuses of the Education Department by the press of both political parties throughout the country. In this we claim to have done good service to the Teaching Profession and to the public. For, in truth, far too little attention was given to such questions, either by teachers, the press, or our public men. No competent or independent educational journal existed, the teachers were apathetic, wanting in *esprit de corps*, at the mercy of the Inspectorate and the bureaucracy of the Department. It seemed nobody's business. The late Examination Frauds, the burked investigation, the flourishing trade in school manuals so shamelessly carried on by members of the Central Committee, but for our persistent, though we trust sufficiently courteous exposure of these evils, might have continued unrebuked. The sentiments we expressed have, we repeat, been endorsed by the press, both Conservative and Reform. With one significant exception, both sides have agreed in treating the education question as one to be considered apart from politics, and on its own merits in the public interest.

I. Of Mr. Crooks, as a member of private society, we have nothing to say, except that a reputation for elaborate dinner-giving, and that kind of social ambition which is called by the irreverent Tuft-hunting, is not a desirable one for a Minister of Education. It is apt to make him think more of a "swell" than a scholar, and in his appointments to prefer those who will shine socially rather than those who have real claims and who possess permanent working power. And this has been precisely the course pursued by Mr. Crooks from the first.

(a) Let us consider his appointments to vacant positions in his gift. In all cases he has shewn an eagerness to rush away to England at once, giving no chance to Canadians to apply, and burdening this debt-hampered and over-taxed country with the expense of one, or it may be two, costly pleasure trips. He has in every instance seemed to set his face against Canadian interests, and to have pre-determined to promote foreigners at any price.

(b) A case in point was the vacant position in the Toronto Lunatic Asylum. For this Mr. Crooks' colleagues imported an Englishman, one Mr. Gowan, although there were, of course, plenty of men in Canada competent for the post. But we know the unhappy result.

(c) Next, when a vacancy occurred in the Agricultural College at Guelph another importation was made from England, a Mr. Brown, whose appointment, it is a matter of history, was equally unhappy. So much for the judgment shewn in the selection from abroad.

(d) Another instance, this time of Mr. Crooks' own preference for foreigners over well-qualified native claimants, is his fetching out from England Mr. Ramsay Wright to fill the chair of Practical Science. The very qualities which no doubt Mr. Crooks admires in the fortunate foreigners who monopolize his favour, that kind of polished mannerism which Oxford gives, are out of place in Canada, and tend to alienate the independent Canadian student. Mr. Ramsay Wright has a stand-off manner and a supreme sense of his own importance, not at all calculated to impress the Canadian University student

who, as a rule, has scant respect for snobs or snobbishness.

(e) The chair of chemistry became vacant in Toronto University, Mr. Crooks of course as usual must import the foreign article, and Mr. Pike arrived from England. The same consequences followed. These Englishmen are accustomed to an artificial social atmosphere altogether different from the free air of Canada; they have been used to deal with young men brought up under a complicated system of rank-worship and wealth-worship. Professor Pike has proved anything but conciliating in his dealings with the students. He lately plucked twenty-nine of them on grounds which were generally considered indiscreet if not harsh, and when the Senate requested him to re-consider his determination he snubbed the Senate by a sullen refusal. Such are the men whom Mr. Crooks delighteth to honour.

(f) We now come to the action lately taken in the matter of the classical chair, and in promoting young Mr. Warren from Oxford over the heads of the ablest and longest-tried of the University Professors, which is now rousing against Mr. Crooks the just indignation of all parties in Canada.

II. When Mr. Mowat abolished the Council of Public Instruction he did so for political reasons which, did space allow us to state the case fully, would illustrate the radical evil of making this Department a political institution. The old Council had done good service such as has never been approached by its successors. It included men like Mr. Goldwin Smith and Professor Wilson, whose names and whose presence were a guarantee against corruption. Last but not least it contained elected representatives of the Teaching Profession. It was replaced by the present Central Committee, in which the teachers had no representation, where there was barely one good name to inspire public confidence, a body composed mainly of inspectors, and for the most part under the influence of Inspector McLellan, a rough, self-asserting person, with much practical talent—for money-making, great love of power, and a keen sense of his own interests, and—what aided him most with a Minister of Education who was also a Party man,—considerable influence of the Ward-politician kind.

Of course Mr. Crooks, coming in as a stranger to administer a complicated machine like the Education Department, must seek advice from some one. In England a new Minister is supposed to have as adviser the under-secretary of his department. The official whose position would answer to that of the under-secretary is the Deputy, Dr. Hodgins. Possibly the strange want of amenity peculiar to Mr. Crooks may have repelled Dr. Hodgins from his duties as ministerial adviser; or does responsibility for the known lack of accord lie at the door of the Deputy, who, since the superannuation of Dr. Ryerson, has been known as a reactionist, and perhaps is not willing to make matters either pleasant or easy for the Minister? Certain it is that if he has fulfilled those duties, the effect of his counsels has been anything but happy. But, practically, the Department is well known to have been in the hands of the Central Committee, or rather of its leading spirit, Inspector McLellan. The members of the Central Committee, as Examiners and also School Inspectors, have in fact got all power in their hands, and some of them proceeded to exercise it by publishing a number of school manuals, partly piracies from other writers, which whether authorized or unauthorized, they were able practically to force on

the teacher, and through him on the public. Some of these manuals are very poorly written, for example, *Inspector* (save the mark!) Hughes' "Manual of Drill," which is saturated with stupid blunders, with solecisms, bad grammar, and incorrect spelling.

A letter over the signature of "Two Teachers," written evidently in the McLellan interest, appeared the other day in the *Mail*. The teachers contended that as Mr. McLellan had arrived at some valuable mathematical results, it was his evident duty to give them to the world. But we fail to discover in McLellan's manual any great advance either in matter or manner over other better known mathematical text-books.

If Mr. McLellan feels it to be his mission to set up as an author on mathematical or other subjects, let him resign his position as Examiner, School Inspector, and member of the Central Committee. What we objected to, and what the general voice of the press of the country supports us in objecting to, is not the fact of Mr. McLellan writing school manuals, a fact which in itself would be very unimportant indeed, but the other very different fact, that it is in Mr. McLellan's power to puff these manuals all over the country, and to force a fictitious sale by the inevitable pressure brought to bear on teachers in his position as Examiner and Inspector. What we contend for is that no Central Committeeman should be allowed to write or edit school manuals, good or bad, under any circumstances whatever. That is the only way to escape even the appearance of corruption, or to secure the pockets of parents against unscrupulous book publishers or their tools. If "the Teachers," who wrote in the *Mail*, have many like-minded, by all means let them subscribe and raise a fund to enable Inspector McLellan to retire from his inspectorship, and devote all his time to giving to the world his valuable ideas in mathematics.

III. Indeed we believe that during Mr. Crooks' term of office the school inspectorate has developed into a vicious system of quackery; objectionable men have been retained, for the most part, for political reasons; and in order to magnify their office, it is but too customary to multiply red tape returns, statistics that rarely go beyond the shelves of the Department, and an overplus of examinations which interferes with the legitimate work of the teacher, and gives Trustees a false ideal of education, to the increase of cramming, that worst pest or parasite of our schools. The schools, under Mr. Crooks' *régime*, are over-inspected and over-governed. The Inspectors have too many functions, and may be said, like the sons of Levi, to take too much upon them. Certainly no Inspector should be an Examiner, still less a member of the ruling Committee.

IV. Another count in the indictment of Mr. Crooks is his conduct with regard to the Book Depository. This has been carried on for about thirty years in unjust competition with the regular book trade. So poor however was the selection of books and so badly managed every business detail, that it became more and more decrepit every year. Still, to the great benefit of those interested, the job was continued, with Mr. Crooks' apparent approval. No balance sheet was ever exhibited, no account of stock was taken, and when the Council of Public Instruction, under a sense of duty, pressed their demand for these, the late Chief Superintendent, by a threat of going to the country with an outcry against the ministry at the then impending election, forced a weak-kneed Minister to dismiss, with customary lack of courtesy,

the Council; no word of thanks being tendered to those eminent scholars whose gratuitous services had so long been given to the Province. Such are the fruits of making the Ministry of Education a political office!

V. But public opinion forced on Mr. Crooks a tardy and reluctant consent to the abolition of the Book Depository. It is not even abolished finally, as yet, but this Fall is to see it extinct. What will become of its huge *omnium gatherum* of unsaleable books it would be curious to inquire. But let us note this fact in the evolution of corruption, how one job, even in dying, germanates another! Dr. May was chief factotum of the moribund Book Depository, which gone, where was Dr. May to go? This problem was to be answered by creating a new office, that of Inspector of Mechanics' Institutes. Hitherto this duty, such as it is, was fulfilled by the local School Inspectors, whose income is to be docked of the sum it brought in, to make up a nice little salary for the favoured Dr. May. Inspection of Mechanics' Institutes, in any case, we are inclined to think can be little else than a farce.

VI. Mr. Crooks has succeeded in putting the University of Toronto in a false position at home and abroad. He ran away to England to look for a President, disregarding the obvious and acknowledged claims of Professor Daniel Wilson; he went like a new Diogenes without a lantern, dragging the credit of Canada through the dust, and when all his overtures were refused, and he could get no competent English scholar to take what he offered, had to come back foiled, and tender the Presidency in a tardy and ungracious way, that made the overture rather an insult than an honour to the gentleman to whom it was at last awarded. The slight thus offered is a slight to all Canada, not the first for which Canada has to square accounts with Mr. Crooks.

VII. When the classical chair was vacant, Mr. Crooks as usual went off to England. To throw dust in the eyes of Canadian scholars, an advertisement was inserted in the papers inviting them to send in their testimonials and claims. But this most dishonest advertisement was not printed until Mr. Crooks had gone to England and was then actually selecting his man! Small chance for a Canadian scholar! Mr. Crooks, who has certainly never made a professional study of classics, selected a young man, a brand new graduate of Oxford, one who had never given any proof of that teaching ability so necessary for the position, or of his power of attracting and influencing youth. The history of the transactions between Mr. Crooks and Mr. Warren is of course a mystery, but subsequent events look as if some promise had been made, either of the Presidency, or if that could not be arranged with Professor Wilson, of the reversion of that office. Meantime Mr. Warren was to be Vice-President, a titular office called into use expressly for him, and a sinecure burdening the public with a large salary. The other Professors, men of tried merit as Teachers, justly incensed at the insult of having this fortunate youth put over their heads, threatened to resign, the press over the country took the matter up, and despite the sophisms of the *Globe*, which endeavoured to evade the point by raising side issues, by accusing of nativism and know-nothingism those who objected, not to Mr. Warren's being an Englishman, but to the manner of his appointment and the circumstances under which the Vice-Presidency was given to him over the heads of those who had higher claims. With the marvellous incapa-

city for the simplest reasoning which of late years distinguishes that paper, the *Globe* in a late article proceeded to argue that *because* the University needs several new professorships for which money is not forthcoming, *therefore* Mr. Crooks is justified in putting the country to the expense of a new sinecure.

IX. The list of blunders is wearisome, but it has two more chapters. In recent amendments to the School Bill Mr. Crooks introduced the mischievous principle of allowing a majority of two-thirds in the municipal bodies to vote the grant levied in their constituencies for education. It is true that they can be compelled to put this question to the people's vote. Anyone who knows these municipal bodies is only too well aware that high views of education, the necessity of paying a proper salary in order to secure good teachers, and the provision of adequate school buildings, are seldom popular with municipal councils.

X. This final indictment relates to the preposterous folly of Mr. Crooks' proposal to appropriate thirty thousand dollars to extend the Upper Canada College boarding house, a measure as impolitic as it would be unjust. How little Mr. Crooks' judgment is esteemed by those of his own political party was shewn by the way in which Reformers united with Conservatives in the Local House to frown this down.

Here we end our review of Mr. Crooks' career as a Minister of Education. It is not yet too late, we would fain hope, for him to retrace his steps. Some of the most mischievous of the abuses above enumerated we have been compelled by a sense of public duty to criticize. It has been an unpleasant duty, but one forced upon us by Mr. Crooks' unfortunate faculty for blundering, and the studied discourtesy with which he has hitherto rejected all advice, save that which has evidently come from a feeble and, we fear, an interested source. If there is any use in tendering counsel we would, in closing, suggest a few reforms of imperative necessity, the adoption of which might do much to calm the public mind and reinstate the Department in the confidence of both the teaching profession and the people. First of all and most important, the power of selecting text books should be separated from the function of examining or of inspecting schools. Secondly, the present Central Committee should be remodelled, and should include an elected representation of the teaching Profession—men whose names and position are such as to insure public confidence. Other reforms might well follow these, together with a seemingly necessary reconstruction of the subordinate staff of the Minister.

THE PAST WHICH WE ARE LEAVING BEHIND.

"I do not approve of your publishing your achromatic works, that is to say, the sciences, which ought to be reserved to the initiated, to select disciples, and should be communicated to them only in oral lessons. In what, then, shall we be superior to other men, if the sciences which you have taught me should become common to all the world?"—*Letter from Alexander the Great to Aristotle.*

THE FUTURE ON WHICH WE ARE ENTERING.

Once we thought that Education
Was a luxury for the few;
That to give it to the many
Was to give it scope undue;
That 'twas foolish to imagine
It could be as free as air,
Common as the glorious sunshine
To the child of Want and Care;
That the poor man, educated,
Quarrell'd with his toil anon.
Old Opinions! Rags and Tatters!
Get you gone! get you gone!

—*Dr. Charles Mackay.*

ARTS DEPARTMENT.

ARCHIBALD MACMURCHY, M.A., MATHEMATICAL EDITOR, *C. E. M.*

Our correspondents will please bear in mind, that the arranging of the matter for the printer is greatly facilitated when they kindly write out their contributions, intended for insertion, on one side of the paper ONLY, or so that each distinct answer or subject may admit of an easy separation from other matter without the necessity of having it re-written.

EDUCATION DEPARTMENT, ONTARIO.

JUNE EXAMINATION, 1880.

ADMISSION TO HIGH SCHOOLS.

ARITHMETIC.

1. Multiply one hundred and seventy-four million five hundred and fifty thousand six hundred and thirteen by six hundred thousand four hundred and seventeen. Explain why each partial product is removed one place to the left.

[104,803,155,405,621 *Ans.*]

2. Define *measure*, *common measure* and *greatest common measure*.

Find the G. C. M. of 153517 and 738950-1522. [13 *Ans.*]

3. Shew that $\frac{2}{3}=\frac{8}{12}$.

Simplify

$$\frac{4\frac{1}{2}\text{ of }\frac{8}{15}\text{ of }7\frac{3}{7}}{12\frac{1}{8}-2\frac{3}{7}}+\frac{2\frac{1}{4}+1\frac{2}{5}\frac{8}{3}}{9\frac{3}{7}-3\frac{5}{11}\frac{5}{3}}-\frac{12354}{12355}$$

[$1\frac{1}{2}\frac{1}{0}\frac{0}{4}\frac{2}{5}\frac{1}{4}$ *Ans.*]

4. A brick wall is to be built 90 feet long, 17 feet high, and 4 feet thick; each brick is 9 inches long, 4½ inches wide and 2½ inches thick. How many bricks will be required? [104448 *Ans.*]

5. A merchant received a case of goods invoiced as follows:—

12 pieces of silk, each 48 yards, at 5*s.* 3*d.* per yard.

15 pieces of cotton, each 60 yards, at 6¼*d.* per yard.

20 pieces of cotton, each 56 yards, at 4¾*d.* per yard.

14 pieces of Irish linen, each 40 yards, at 1*s.* 3½*d.* per yd.

Supposing the shilling to be worth 24⅓ cents, find the amount of the above bill of goods. [$1,133.39$\frac{5}{6}$ *Ans.*]

6. Divide 76·391955 by nine hundred and twenty thousand three hundred and eighty-five *ten-billionths*. [830000 *Ans.*]

7. D. D. Wilson, of Seaforth, exported last year 8360 barrels of eggs, each containing the same number. He received an average price of 14.85 cents per dozen. Allowing the cost (including packing, etc.) to have been 13.5 cents per dozen, and the entire profit to have been $7900.20, find the number of eggs packed in each barrel. [840 *Ans.*]

8. The dimensions of the *Globe* newspaper are 50 inches by 32 inches, and the daily issue is about 24000 copies, how many miles of Yonge street, which is abont 70 feet wide, might be covered with ten weeks' issue? [43$\frac{67}{71}$ *Ans.*]

9. A flag-staff 120 feet high was broken off by the wind, and it was found that .76 of the longer part was $\frac{8}{15}$ of 9½ times the shorter part. Find the length of each part. [45, 75 *Ans.*]

10. A and B together can do a piece of work in ¾ of a day, B and C in $\frac{9}{10}$ of a day, and C and A in $\frac{1}{3}\frac{2}{5}$ of a day. In what time could all working together do the work? [$\frac{3}{4}\frac{2}{3}\frac{8}{1}$ *Ans.*]

English Grammar.

1. Parse—"The stranger trod upon alabaster slabs, each bearing an inscription recording the titles, genealogy, and achievements of the great king."

2. Analyze—"He who entered them might thus read the history, and learn the glory and triumphs of the nation."

3. (*a*) Define four classes of Pronouns, and give an example of each class.

(*b*) Decline *He* in both numbers.

4. Correct the following, if necessary, giving your reasons for making the changes:

(*a*) It could not have been her.

(*b*) You are stronger than me.

(*c*) I cannot work like you.

(*d*) My friends approve my decision, especially them who are best acquainted with the circumstances.

(*e*) I do not know neither how it was done nor who done it.

5. (*a*) What nouns form their plural by adding *es* to the singular.

(*b*) Write the *possessive plural* of *lady, orphan, mechanic.*

6. Write the *third singular* form of *to see* in each tense in the indicative mood.

English History.

1. Explain what is meant by the following terms:—Feudalism, Crusade, the Invincible Armada, Cabinet Minister, the Pretender, the Premier.

2. Name, in order, the sovereigns of Great Britain from James I. to Victoria, shewing how each was related to his or her predecessor.

3. What were the wars of the Roses? When were they waged? Why are they important events in English history?

4. In whose reign did those eminent persons live, and for what is each of them distinguished: Thomas à Becket, Sir Walter Raleigh, William Pitt?

5. What was the cause of the Great Civil War in England? Who were the principal persons engaged in it? What were its results?

6. What are the principal differences between the British Parliament and that of the Dominion?

Geography.

1. Define Watershed, Frith, Delta, Horizon, Axis of the Earth, Polar Circles, Ecliptic First Meridian.

2. (*a*) Why are the days longer in Summer than they are in Winter in the Northern Hemisphere? (*b*) What causes the change of seasons? (*c*) Why does the sun appear to rise in the East?

3. Trace the following rivers from their rise to their outlet, and name the principal cities on their banks:—Danube, Rhine, Ganges, St. Lawrence, Mississippi.

4. Name the cities of Ontario, and give the situation of each.

5. Over what railroads would you pass in going (i.) from Hamilton to Peterboro'; (ii.) from Collingwood to London?

6. What are the chief natural productions of Manitoba, Nova Scotia, Southern States of America, France, China?

7. Where are the following:—Islands—Malta, Anticosti, Ceylon? Capes—Verde, Comorin, La Hogue? Bays—Verte, All Saints, Table?

SECOND CLASS TEACHERS AND INTERMEDIATE.

English Literature.

1. What are the distinguishing features of the school of Pope? What characteristics have Gray and Goldsmith in common with it, and in what does each differ from it?

2.

"Hence every state, to one loved blessing prone,
Conforms and models life to that alone,
Each to the favourite happiness attends,
And spurns the plan that aims at other ends;
Till carried to excess in each domain,
This favourite good begets peculiar pain."

—*The Traveller, ll,* 93-98.

(i.) State, quoting the words of Goldsmith, if you can, the "favourite good" and the

"peculiar pain" of each of the nations to whose cases he refers in support of his argument.

(ii.) Shew to what extent the subsequent history of each of these nations bears out his views.

(iii.) Explain the meaning of "domain."

3.

"But all the gentler morals, such as play
Through life's more cultured walks, and charm the way."
—*The Traveller, ll.* 235 *and* 236.

Explain fully what is meant by "the gentler morals."

4. What were Goldsmith's views as to the dangers to which freedom and good government were exposed in England when The Traveller was written? Explain these views by referring to the history of the time.

5.

"For just experience tells, in every soil,
That those who think must govern those that toil:
And all that freedom's highest aims can reach
Is but to lay proportioned loads on each.
Hence, should one order disproportioned grow,
Its double weight must ruin all below."
—*The Traveller, ll.* 371-376.

(i.) Write out the lines following this extract that indicate the "order" which, in Goldsmith's opinion, was growing too powerful.

(ii.) *Those who think must govern those that toil.* On this Mr. Sankey remarks: "So far from 'just experience' teaching this no nation has ever been governed by its thinkers." Mr. Stevens says: "Those who toil at manual labour have, as a rule, neither the time nor the learning requisite for the study of political or social economy."

Criticize these comments, and state clearly what you consider to be Goldsmith's meaning.

6. Write out in full the stanzas of Gray's Elegy in which the following words occur:—

"Cromwell."

"The genial current of the soul."

"E'en in our ashes live their wonted fires."

"The long-drawn aisle and fretted vault."

7.

"For who to dumb Forgettulness a prey,
This pleasing anxious being e'er resigned,
Left the warm precints of the cheerful day,
Nor cast one longing, lingering look behind?"

(i.) In what different ways may you construe "prey?" Explain the meaning given by each construction.

(ii.) Explain fully the meaning of "pleasing anxious being," "precincts," and "day."

History.

1. Tell what you know about the settlement of the Danes in England, and state what traces of that settlement still exist.

2. What were the causes, and what the results of the Peasant Insurrection of 1381?

3. What was the nature of the claim of Henry V. to the Crown of France, and what was the issue of the claim?

4. Give some account of "monopolies," the "Habeas Corpus Act," the Trial of Charles I., the Accession of William III.

5. Write a concise sketch of the reign of George III., with reference to [1] domestic politics, [2] foreign wars, [3] literature.

6. Write an explanatory note on this passage from the text-book:—"From the twelfth century to the reign of Edward III., we may reckon three written languages in use in England."

7. When did the confederation of the Canadian Provinces take place, and what led to it?

8. What is the difference between a federal and a legislative union? When, and to what extent, did the latter exist in Canada?

9. State the causes and the results of the third Punic war.

10. Account for the great powers possessed by the Roman Emperor Augustus.

Geography.

1. Define Estuary, River-basin, Tropic, Neap-tide, Republic.

2. Explain the cause of Ocean Currents, and give the name and course of *three* of the most important.

3. Trace the Mississippi River from its source to its mouth, naming the chief tributaries from East and West, the States and chief towns bordering upon its banks, and

the principal commercial products for which it affords an outlet.

4. Sketch that part of Europe from the Straits of Dover to the Gulf of Genoa, indicating the rivers, bays, capes and cities of importance along the coast.

5. Over what railroads, across what intersecting lines of railway, and through what cities and large towns would you pass on a trip from Berlin to Amherstburg?

6. What and where are Ste. Maurice, Scugog, Rimouski, Chignecto, Pelee, Shediac, Burrard, Roanoke, Galveston and the Cyclades?

7. Locate Cape St. Lucas, Havana, Staten Island, Yapura River, Jutland, Valparaiso, the Cambrian Hills, Cape Agulhas, Scilly Islands, Table Bay, Warsaw, Baikal, Tonquin, Ormuz, Loo Choo, and Zambezi.

NATURAL PHILOSOPHY.

1. What conditions are necessary so that three forces acting on a body may maintain equilibrium?

Shew how the following forces may be arranged so as to produce equilibrium:—(i.) 4 lbs., 5 lbs. and 7 lbs. (ii.) $(\sqrt{7}+\sqrt{5})$ lbs., $(\sqrt{7}-\sqrt{5})$ lbs., and $2\sqrt{7}$ lbs. (iii.) 1 lb., 4 lbs. and $\sqrt{17}$ lbs.

2. Examine the truth of the following statement:—"If three forces acting on a body are parallel to the sides of a triangle they will keep it at rest."

A rod AC (supposed without weight) hinged at C has a weight of 200 lbs. hung at A, and is kept in position by a horizontal tie-rod AB. The angle BAC is 30°; find the tension of the tie-rod and the thrust along AC.

3. If two sides of an equilateral triangle, taken in order 8 ft. long, represent in direction and magnitude two forces acting at a point, find two equal forces, acting at an angle of 120° to each other, which will, with these forces, produce equilibrium.

4. In a system of four pulleys, each hanging by a separate string, the weight of each pulley being 1lb., find the relation between the power and the weight.

If a force of $2\frac{1}{2}$ lbs. just supports a weight of 45 lbs. in such a system, and the weight of the pulleys be equal, find the weight of each pulley.

5. If a substance be weighed in a balance having unequal arms, and in one scale appear to weigh m lbs., and in the other 4 n lbs., what is the true weight of the substance, and what is the ratio between the lengths of the arms of the balance?

6. Find the ratio of the power to the weight in the case of the inclined plane when the power acts [i.] parallel to the plane, [ii.] parallel to the base.

Shew that the power is most effective when acting parallel to the plane.

7. Define Specific Gravity, and shew how to find the specific gravity of a body lighter than water.

A piece of wood weighs 4 lbs. in air and a piece of lead weighs 5 lbs. in water. The lead and the wood together weigh 4 lbs. in water; determine the specific gravity of the wood.

8. Describe, using diagram, the structure of the Lifting Pump. What determines the height to which water may be raised by means of it?

Describe the thermometer. At what temperature will the reading of the Fahrenheit thermometer be three times as great as that of the Centigrade. Give your answer in degrees Fahrenheit.

9. A cubical block of wood whose edge is 18 inches and whose sp. gr. is .75 is placed in water and pressed by a force into such a position that its upper surface, which is horizontal, is just 1 foot below the surface of the water; find the pressure on the whole outside of the cube, and the downward force acting upon it.

EUCLID.

1. Define Right Angle, Rectilineal Figure, Scalene Triangle, Postulate, Parallel Straight Lines, Gnomon.

2. (*a*) If two triangles have two sides of the one equal to two sides of the other, each to each, but the angle contained by the two sides of the one greater than the angle contained by the two sides of the other, the base of that which has the greater angle shall be greater than the base of the other.

(*b*) What restriction does Euclid make in his construction, and why?

3. The opposite sides and angles of a parallelogram are equal to one another and the diameter bisects it, that is, divides it into two equal parts.

4. To describe a parallelogram that shall be equal to a given triangle, and have one of its angles equal to a given rectilineal angle.

5. If a straight line be divided into any two parts, the rectangle contained by the whole and one of the parts is equal to the rectangle contained by the two parts together with the square on the aforesaid part.

6. If a straight line be divided into two equal, and also into two unequal parts, the squares on the two unequal parts are together double of the square on half the line, and of the square on the line between the points of section.

7. Through a given point draw a line, so that the parts of it, intercepted between that point and perpendiculars upon it from two other given points, may be equal to each other.

8. BCDF is a four-sided figure having the side BC parallel to the side FD. If BD and FC be joined by straight lines intersecting in K, shew that the lines BD and CF are together greater than the two lines BF and CD, also that the triangle CKD is equal to the triangle BKF.

9. ABCD is a rectangle, E any point in BC, and F any point in CD. If AF, AE and EF be joined, shew that the rectangle ABCD is equal to twice the triangle AEF, together with the rectangle EB, DF.

10. Produce one side of a scalene triangle so that the rectangle under it and the produced part may be equal to the difference of the squares on the other two sides.

Chemistry.

1. Describe the chief characters of (1) ammonia, (2) ammonium carbonate; and the process by which they are usually prepared. Give also the chemical re-actions which occur in these processes.

2. Describe fully the modes of decomposing water, which you have seen. State how you would determine whether a given specimen of water is hard or soft. If the water is found to be hard, state (with reasons) the various means by which it could be made soft.

3. What means are best employed for the collection of nitric oxide, chlorine, ammonia, carbonic acid, sulphur dioxide, and nitrous oxide gases.

4. Describe fully the experiment in which the re-actions are given by the equation

$$CaCO_3 + 2HCl = CaCl_2 + H_2O + CO_2.$$

5. Describe some of the properties of sulphur, and state its allotropic modifications, and how they are obtained. Sulphur is said to be a *dimorphous* body—explain.

6. Calculate the percentage composition by weight of potassium nitrate, and of the two oxides of carbon.

7. Write down the atomic weight, the molecular weight, the relative weight, the specific gravity, the atomic and the molecular volume of chlorine, and fully explain the meaning of these terms.

8. Complete the following equations:—

$FeS + H_2So_4 =$

$Na_2SO_3 + S =$

$CaO + Na_2CO_3 + HO =$

$Si\ O_2 + 4HF =$

9. Describe a mode of preparing sulphur dioxide, and give and explain the equations representing the re-actions. Explain the difference between the bleaching action of chlorine and sulphurous acid.

10. On completely decomposing by heat a certain weight of potassium chlorate, 20.246 grains of potassium chloride was obtained. What weight of potassium was used, and how much oxygen was evolved?

LATIN.

I.

CICERO, *in L. Catilinam*, II., III., IV.

(*a*) Translate:

Quamquam isti, qui Catilinam Massiliam ire dictitant, non tam hoc queruntur quam verentur. Nemo est istorum tam misericors, qui illum non ad Manlium quam ad Massilienses ire malit. Ille autem, si mehercule hoc, quod agit, nunquam ante cogitasset, tamen latrocinantem se interfici mallet quam exsulem vivere. Nunc vero, quum ei nihil adhuc præter ipsius voluntatem cogitationemque acciderit, nisi quod vivis nobis Roma profectus est, optemus potius, ut eat in exsilium, quam queramur.

(1) *Isti.* What is the force of the word?

(2) Shew the connection of this passage with the argument.

(3) Before whom was this oration pronounced?

(*b*) Translate:

Itaque illorum responsis tunc et ludi per decem dies facti sunt, neque res ulla, quæ ad placandos deos pertineret, prætermissa est: iidemque jusserunt simulacrum Jovis facere majus et in excelso collocare et contra, atque ante fuerat, ad orientem convertere: ac se sperare dixerunt, si illud signum, quod videtis, solis ortum et forum curiamque conspiceret, fore, ut ea consilia, quæ clam essent inita contra salutem urbis atque imperii, illustrarentur, ut a senatu populoque Romano perspici possent.

(1) Mark the quantity of the penult. in *inita*, *pertineret*, *perspici*.

(2) Parse *responsis*, *placandos*, *inita*, giving the principal parts.

Translate:

Sed ea, quæ exaudio, Patres conscripti, dissimulare non possum. Jaciuntur enim voces, quæ perveniunt ad aures meas, eorum, qui vereri videntur, ut habeam satis præsidii ad ea, quæ vos statueritis hodierno die, transigunda. Omnia et provisa et parata et constituta sunt, Patres conscripti, quum mea summa cura atque diligentia, tum multo etiam majore populi Romani ad summum imperium retinendum et ad communes fortunas conservandas voluntate. Omnes adsunt omnium ordinum homines, omnium denique ætatum; plenum est forum, plena templa circum forum, pleni omnes aditus hujus templi et loci. Causa est enim post urbem conditam hæc inventa sola, in qua omnes sentirent unum atque idem præter eos, qui, quum sibi viderent esse pereundum, cum omnibus potius quam soli perire voluerunt.

(1) Decline *aures*, *loci*, *soli*; give the gender of *ordinum*; conjugate *transigunda*, *pereundum*; account for the mood of *viderent*.

(2) *Conscripti*—What is the origin of the term?

(3) Distinguish *vereor ut* and *vereor ne*.

(4) Turn into Latin—*We must all perish; I see of what consequence it is to me.*

II.

VIRGIL—*Eclogues.*

(*a*) Translate:

MEL. Impius hæc tam culta novalia miles habebit?
Barbarus has segetes? en, quo discordia cives
Produxit miseros! en, queis consevimus agros!
Insere nunc, Melibœe, piros, pone ordine vites:
Ite meæ, felix quondam pecus, ite capellæ.
Non ego vos posthac, viridi projectus in antro,
Dumosa pendere procul de rupe videbo;
Carmina nulla canam; non, me pascente, capellæ,
Florentem cytisum et salices carpetis amaras.
TIT. Hic tamen hanc mecum poteras requiescere noctem
Fronde super viridi; sunt nobis mitia poma,
Castaneæ molles, et pressi copia lactis;
Et jam summa procul villarum culmina fumant,
Majoresque cadunt altis de montibus umbræ.

(1) *Impius*, *barbarus*—Why these epithets?

(2) *Queis* to *agros*—Explain the meaning.

(3) Parse *consevimus*, *pendere*, *pascente*, giving the principal parts.

(4) Explain the construction of *noctem* and *nobis*.

(*b*) Translate:

Prima Syracosio dignata est ludere versu
Nostra neque erubuit silvas habitare Thalia.
Quum canerem reges et prœlia, Cynthius aurem
Vellit, et admonuit: "Pastorem, Tityre, pingues
Pascere oportet oves, deductum dicere carmen." 5
Nunc ego (namque super tibi erunt, qui dicere laudes,
Vare, tuas cupiant, et tristia condere bella,)
Agrestem tenui meditabor arundine Musam.
Non injussa cano. Si quis tamen hæc quoque, si quis
Captus amore leget; te nostræ, Vare, myricæ, 10
Te nemus omne canet; nec Phœbo gratior ulla est,
Quam sibi quæ Vari præscripsit pagina nomen.

(1) Scan ll. 2, 3, 5, 6, marking all quantities.

(2) Explain the meaning of l. 1.

(3) *Deductum*—What is the meaning?

(4) Write short notes on *Thalia, Cynthius*.

(5) What figure in l. 6.

(6) Scan the following lines, and notice peculiarities of metre:

Ille latus niveum molli fultus hyacintho
Vir gregis ipse caper deeraverat; atque ego Daphnim.

(7) Quote the speech of Melibœus (Ecl. I.), commencing 'Fortunate senex,' etc., *or* the prophecy (Ecl. IV.), commencing 'At tibi prima, puer,' etc.

III.

Grammar and Composition.

1. Decline in both numbers *deus*, *vis*, *bos*, *celer*; *eadem filia*.

2. Compare *dives*, *maledicus*, *arduus*.

3. Write in full the future perfect indicative, the present and imperfect subjunctive, and the present infinitive of *malo*, *fero*, *fio*, *edo*.

4. Which are the *primary*, and which the *historic tenses?*

5. Give rules, with examples, for the case of the name of the place where anything happens.

6. What verbs take a double accusative? What is a cognate accusative? Give examples in Latin.

7. Translate into Latin—

(*a*) A lion advised a goat walking on the top of a rock to descend into the meadow. But the goat answered him, 'I am not one to prefer pleasure to safety.

(*b*) He threatened me with death.

(*c*) (The Latin words are given below.) Do you, Romans, since it is now night, having paid your adorations to Jupiter yonder, the guardian of this city and of yourselves, depart to your several abodes, and, though the peril is for the time averted, nevertheless defend them with watchmen and sentinels just as (you did) the night before. I will take care that you shall not have to do it very long (compar.), and that you may be able to live (lit. to be) in lasting peace.

Tu, Quiris, quoniam jam nox sum, veneror Jupiter ille, custos hic urbs ac tu, in vester tectum discedo, et is, quamquam jam sum periculum depello, tamen æque ac prior nox custodia vigilia que defendo. Is ne tu diu facio sum atque ut in perpetuus pax sum possum provideo.

MATHEMATICS.

Arithmetic (Third Class).

1. Examine the statement "Division is a short method of Subtraction." Apply your answer to illustrate the following examples: (1) Divide \$48 by \$16. (2) Divide \$48 by 16. (3) Divide \$48 among 16 boys.

2. Explain clearly the principles involved in finding the sum of two fractions.

Simplify $\frac{1}{5}(3\frac{1}{3}+1\frac{1}{4})$ of £1+$\frac{1}{4}$ of

$$\frac{1\frac{1}{8}-\frac{1}{8}\text{ of }1\frac{5}{6}}{\frac{1}{10}\text{ of }3\frac{1}{3}+\frac{1}{7}\frac{3}{2}}\times .95\text{ of }5s.+\frac{2.1}{.012}d.$$

£1 14*s.* 1¼*d.*

3. What is the square of a number? The square root?

Explain why, in extracting the square root of a number, you mark off the number into "periods of two figures each."

Simplify

$$(3\sqrt{32}-2\sqrt{28})\div(\sqrt{32}-\sqrt{28}).$$

$$\frac{3\sqrt{32}-2\sqrt{28}}{\sqrt{32}-\sqrt{28}}$$

$$=\frac{(3\sqrt{32}-2\sqrt{28})(\sqrt{32}+\sqrt{28}}{32-28}$$

$$=10+2\sqrt{14}.$$

4. Define *ratio*, *proportion*, and *mean proportional*.

The quantity of saline matter in sea water is .036 of the whole weight, and of this weight .061 is magnesia. Find the number of grains of magnesia in a cubic foot of sea water, supposing 32 cubic feet of it to weigh 2000 lbs.

866¼ grs.

5. Shew that "Bank" discount exceeds "True" discount by the simple interest on the True discount.

If $6 be allowed as true discount on a bill of $150 having a certain time to run, what would be the discount if the bill had twice as long to run?

$11.53⅓.

6. *A* and *B* form a partnership, *A* supplying 25 per cent. more capital than *B*. At the end of the year *A* withdraws 60 per cent. of his capital, and *B* withdraws 40 per cent. of his; at the end of two years there is a gain of $3383.50 to be divided. How much does each receive?

$A=5$ for 1 yr. and 2 for 1 yr. $=7$;
$B=4$ for 1 yr. and $\frac{1}{5}2$ for 1 yr. $=6\frac{2}{5}$.
$A : B :: 35 : 32$,
$A=\$1767.50$; $B=\$1616$.

7. A merchant bought 350 yards of silk and 1470 yards of lustre, the price per yard of the lustre being 30 per cent. that of the silk; he sold the silk at a gain of 35 per cent. and the lustre at a loss of 33⅓ per cent., and lost on the whole $39.20. Find the cost price of the silk per yard.

If 1 be price of the silk per yard, then $\frac{3}{10}$ is that of the lustre. He gains $\frac{7}{20}$ on silk per yard and loses ⅓ on lustre per yard.

$$\frac{1}{10}\times 1470-\frac{7}{20}\times 350=\$39.20;$$

$\therefore$ 1 = $1.60 = price of silk per yard.

8. An agent sold a consignment of flour for $4800, and invested the proceeds (less his commission on both transactions) in the purchase of tea, receiving on the latter purchase 4 per cent. on the amount invested. His commission on both transactions being $300, find his rate of commission on the sale of the flour.

2½½ per cent.

9. Find to six decimal places the average of $2\frac{3}{8}$, 2.37, 3.006̇, 0, $2.97\frac{4}{7}$, and 3.516̇.

2.744816.

10. There is a garden plot in the form of a trapezoid, whose two parallel sides are 40 yards and 50 yards respectively, the other sides being respectively 30 yards and 24 yards. Shew that the perpendicular distance between the parallel sides is $\frac{32}{5}\sqrt{11}$.

Let y = length of perpendicular between parallel sides, and x = distance from angle adjoining side 30.

$$\overline{30-x^2}=\overline{24-10-x}^2,\ x=\frac{106}{5},$$

$$30^2=\left(\frac{106}{5}\right)^2+7^2;\ \therefore\ 7=\&c.$$

ARITHMETIC (SECOND CLASS).

1. The G. C. M. of two numbers is 9187, and their L. C. M. is 634938944494; one of the numbers is 68590142, find the other.

The G. C. M. × L. C. M. = product of of two numbers;

$\therefore$ $634938944494\times 9187=68590142\times$ No.;

$\therefore$ No. $=\frac{634938944494\times 9187}{68590142}=85044059.$

2. (1) Divide 159.982 by .0009840018 to 7 places of decimals.

(2) Reduce $\frac{61}{4649}$ to a periodic decimal.

(3) Reduce .7002457̇ to a vulgar fraction.

(1) $\frac{159.982}{.0009840018}=162583.0359253.$

(2) $\frac{61}{4649} = .0131211.$

(3) $.7002457 = \frac{25935}{37037}.$

3. There is a rectangular garden whose length is to its breadth as 6 to 5; running round its outside is a gravelled path 3 yards wide; this path cost, at 18¾ cents per square yard, $127.25. Find the dimensions of the garden.

If the length of the side of the garden be represented by 6, the breadth will be 5 and the perimeter 22, and the area of the path will be 22 × 3 sq. yds. = 66 sq. yds.; but from the question, No. of sq. yds. in path $= \frac{12725 \times 4}{75} = \frac{509 \times 4}{3}$;

$\therefore 66 = \frac{509 \times 4}{3}$, and 6 or side $= \frac{509 \times 4}{33} = 61\frac{23}{33}$ yds;

and 5 or breadth $= \frac{509 \times 4 \times 5}{6 \times 33} = 51\frac{11}{33}$ yds.

4. Simplify $\frac{2\sqrt{90}}{3\sqrt{108}} \times \frac{7\sqrt{192}}{5\sqrt{126}} \div \frac{4\sqrt{15}}{15\sqrt{21}}$. Find the mean proportional between 3402 and 15172; and extract the square root of .000097199881.

The expression $=$

$$\frac{2\sqrt{2 \times 5 \times 3^2 \times 7}\ \sqrt{2^6 \times 3} \times 15\ \sqrt{3 \times 7}}{3\sqrt{2^2 \times 3^3} \times 5\ \sqrt{2 \times 7 \times 3^2} \times 4\ \sqrt{3 \times 5}} = 4\tfrac{2}{3}.$$

5. The oxygen of the air is 3 parts (by volume) in 14 of the whole; 100 cubic inches of air weigh 31 grains, and the weight of oxygen is to that of air as 53 : 48. Find the number of grains of oxygen in a cubic foot of air.

$$\text{No. of grains} = \frac{31 \times 1728 \times 53 \times 3}{100 \times 48 \times 14} = 126.46.$$

6. A, B and C do a piece of work; it would have taken A 2½ times as long as B and C together, and B 3½ times as long as A and C together. If they receive $240.40 for the work, how much should each man receive?

A can finish the work alone in 18 days, *B* in 14 and *C* in 31; together they could do it in $\frac{1953}{311}$ days. $\therefore$ *A*'s share of the money $= \$83.86\frac{8}{311}$, *B*'s $= \$107.83\frac{81}{311}$, *C*'s $= \$48.69\frac{8}{311}$.

7. Assuming that 80 cubic inches of lead, together with 81 cubic inches of cork, are equal in weight to 2308 cubic inches of pine, and that the weights of equal bulks of lead and pine are represented by the numbers 226.48, and 9, respectively; determine the proportionate weight of an equal bulk of cork.

A cubic inch of lead $= \frac{226.48}{9}$ cubic inches of pine in weight;

$\therefore$ 90 cubic inches of lead $= 2264.8$ cubic inches of pine in weight;

$\therefore$ 2308 cubic inches of pine $- 2264.8$ cubic inches of pine $= 43.2$ cubic inches of pine $=$ 81 cubic inches of cork;

$\therefore$ a cubic inch of pine $= \frac{810}{432}$ cubic inches of cork;

$\therefore$ required numbers are, 9 lead $= 226.48$ pine $= 424.65$ cork.

8. A merchant in Toronto owes £560 stg. in London, and remits as follows: first to Paris at 5 francs 60 centimes per $1; thence to Hamburg at 2 francs per marc; thence to Amsterdam at 17½ stivers per marc; thence to London at 224 stivers per £1. If the expense of this circuitous exchange be 2 per cent. (*i.e.* of $102 paid by the merchant, $2 is lost in commission), find what it costs to discharge the London debt.

$$£560 \text{ stg.} = \$\frac{224 \times 2 \times 2 \times 102 \times 560}{35 \times 5.60 \times 100} = \$2611.20.$$

9. I had two notes whose aggregate face-value was $761.70, and each of which had 15 months to run; one of the notes was discounted at 10 per cent. bank discount, and the other at 10 per cent. *true* discount, and the total amount realized was $671.50. Find the face of the note on which *true* discount was allowed.

10. A cylindrical silver wire, .0015 millimetre in diameter, weighs 3.2875 grammes; it is to be covered with a layer of gold .0002 millimetre in thickness. Required the weight of the gold, the specific gravity of silver being 10.47, and that of gold 19.26.

ARITHMETIC (FIRST CLASS).

1. Prove the rule for multiplying one fraction by another, and deduce that for dividing one fraction by another.

Prove

$$\frac{\lfloor 48}{\lfloor 13 \times \lfloor 35} + 3\cdot\frac{\lfloor 48}{\lfloor 12 \times \lfloor 36} + 3\cdot\frac{\lfloor 48}{\lfloor 11 \times \lfloor 37} + \frac{\lfloor 48}{\lfloor 10 \times \lfloor 38} = \frac{\lfloor 51}{\lfloor 13 \times \lfloor 38}.$$

Book work.

Bringing the fractions to a common denominator, and adding, we have

$$\frac{\lfloor 48}{\lfloor 13 \lfloor 38}\Big\{36.37.38+3.13.37.38+3.12.13.38+11.12.13\Big\} = \frac{\lfloor 51}{\lfloor 13 \lfloor 38}$$

2. Shew, without algebra, the reasons of the rules for pointing in multiplication and division of decimals.

Reduce to a decimal of four places:

$$\frac{1}{2^2}+\frac{2}{2^3}+\frac{3}{2^4}+\frac{4}{2^5}+\frac{5}{2^6}+\frac{6}{2^7}+\frac{7}{2^8}+\frac{8}{2^9}.$$

Book work.

Let $S=\frac{1}{2^2}+\frac{2}{2^3}+..+\frac{8}{2^9}$,

$$\therefore \frac{S}{2}=\frac{1}{2^3}+..+\frac{7}{2^9}+\frac{8}{2^{10}};$$

subtracting $\frac{S}{2}=\frac{\frac{1}{2^2}\left(1-\frac{1}{2^8}\right)}{\frac{1}{2}}-\frac{8}{2^{10}}$,

$$\therefore S=\frac{255}{256}-\frac{8}{512},$$

$$=.98044+..$$

3. A rectangular piece of ground contains 9 acres 1 rood 16⅓ poles; its length is to its breadth as 3 to 1: find (1) the distance round it, (2) the distance from one corner to the opposite corner.

$$9 \text{ ac. } 1 \text{ ro. } 16\tfrac{1}{3} \text{ po.} = \frac{4489}{3} \text{ po.} = \frac{\text{length}^2}{3},$$

$\therefore$ distance round=178⅔ po., and distance from corner to corner=70.62+.. poles.

4. Investigate a rule for finding the amount of an annuity at compound interest for a term of years.

I borrowed $2000 for four years at 10 per cent. compound interest, to be paid in four equal annual payments. Find the annual payment.

Book work.

Let a be the annual payment,

$$\therefore a\{1+1.1+(1.1)^2+(1.1)^3\}=2000$$

$$a=\$430.941+..$$

5. A piece of glass whose specific gravity is 2.4, and whose weight is 4½ lbs., is found to weigh only 2¼ lbs. when weighed in a certain liquid. Find the specific gravity of the liquid.

If v be volume of piece of glass, e sp. gr. of liquid, g local acceleration due to action of gravity,

$$\left.\begin{aligned} 2.25&=gev: \\ 4.5&=gv(2.4); \end{aligned}\right\} \therefore e=1.2.$$

6. Shew how to find the true discount for a given time and rate.

I bought a bill of goods amounting to $1040, for which I gave my note payable in six months without interest, and immediately sold the goods for $1200 on such a term of credit as made my gain 17 %, reckoning money worth 8 %. Find the term of credit.

Book work.

Gain by buying at credit=4% of $1040=$41.60; gain by selling=$160, but total gain=17½% of $1040=$182.

$\therefore$ $(160+41.60-182)=interest of $1200 for certain time.

$\therefore$ time=4.9 months.

7. Prove that the area of a circle = πr^2, or = radius × ½ circumference.

What is the proportionate error in the following rough rule for finding the area of a circle?—Take $\frac{7}{9}$ of the square on the diameter, and add one per cent.

See Todhunter's Trigonometry.

$$\frac{22}{7}r^2 \sim \left(\frac{7}{9}\cdot 4r^2 + \frac{7}{900}\cdot 4r^2\right) = \frac{r^2}{11575}.$$

8. A cistern is kept constantly supplied with water; supposing it full, it is found that 24 equal taps opened together will empty it in $5\frac{1}{2}$ minutes, and 15 of them will empty it in 13 minutes. How many of them will empty it in 33 minutes?

If 1 represent the capacity of the cistern, the constant supply will be found to be $\frac{14}{11\times 13}$ and the quantity of water emptied by each pipe $= \frac{5}{3\times 11\times 13}$ in 1'. Therefore number of pipes $= \left(1+\frac{14\times 33}{11\times 13}\right) \div \frac{5\times 33}{3\times 11\times 13} = 11.$

9. State the rule for finding the characteristic of the logarithm for any number.

Find the number of digits in the integral part of $30^{20}\times 5^{15}\div 2^{11}$, and the number of ciphers between the decimal point and the first significant figure of the decimal representing 3^{-15}.

See Cherriman & Baker's Trigonometry.

$$\log \frac{30^{20}\times 5^{15}}{2^{11}} = 20\log 3 + 15 - 26\log 2.$$

$$= 16\,715646.$$

∴ number corresponding to this logarithm has 17 digits in its integral part.

$$\log \frac{1}{3^{15}} = -7.1568195.$$

∴ there are seven ciphers between the decimal point and the first significant figure.

[Logarithm of 2 and 3 should have been given for this question.]

10. (1) The base of a triangle is b, and its altitude a, required the distance from the vertex at which a parallel to the base must cut the altitude in order to bisect the triangle.

(2) The perimeter of a right-angled triangle is p, and the radius of the inscribed circle is r; determine the sides of the triangle.

(1) Let x be altitude of triangle to be cut off. Then since similar angles are to one another in duplicate ratio of their homologous sides

$$x^2 : a^2 :: \frac{ab}{4} : \frac{ab}{2}, \quad \therefore x = \frac{a}{\sqrt{2}}.$$

(2) If c be the right angle,

$$c^2 = a^2 + b^2, \; rp = ab;$$

$$\therefore a + b = \sqrt{c^2 + 2rp}$$

$a - b = \sqrt{c^2 - rp}$, whence, etc.

ALGEBRA (THIRD CLASS).

1. If $\pi = 3.1416$, $a = 5$ inches, and $h = 7$ feet 11 inches, find the value of $2\pi(ah + a^2)$.

$21\frac{8}{10}$ square feet.

2. If $x = .4$, find, correct to one decimal place, the value of $x^8 - 4x^6 - 2x^4 - 52x^2 + 9$.

.613.

3. If $x = a + d$, $y = b + d$, $z = c + d$, prove that

$$x^2 + y^2 + z^2 - xy + yz + zx = a^2 + b^2 + c^2 - ab - bc - ca.$$

Substitute the values of x, y, z on the right-hand side of the equation, and the result will follow.

4. Divide $a^3 + b^3 + c^3 - 3abc$ by $a + b + c$.

$$a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ac).$$

5. Find the factors of

(*a*) $15x^2 - 19xy - 10y^2$.

(*b*) $15(a+b)^2 + 14(a+b)(x+y) - 8(x+y)^2$.

(*c*) $x^3 - x^2y - xy^2 + y^3$.

(*a*) $15x^2 - 19xy - 10y^2 = (5x + 2y)(3x - 5y)$.

(*b*) $15(a+b)^2 + 14(a+b)(x+y) - 8(x+y)^2 = \{5(a+b) - 2(x+y)\}\{3(a+b) + 4(x+y)\}$.

(*c*) $x^3 - x^2y - xy^2 + y^3 = x^2(x-y) - y^2(x-y) = (x+y)(x-y)^2$.

6. Solve

(*a*) $(10x - 11)(11 + 2x) + (5x - 11)(11 + 3x) + (7x - 11)(11 - 5x) = 0$.

(*b*) $(x - 2n + 1)^2 - (2n - 1)^2 = (x - 2n)^2$.

(*a*) $x = \frac{3}{2}$; (*b*) $x = 2n^2$.

7. What value of x will make $x^3+3cx^2+2c^2x+5c^3$ equal to the cube of $x+c$?

$(x+c)^3=x^3+3cx^2+3c^2x+c^3=x^3+3cx^2+2c^3x+5c^3$; $\therefore x=4c$.

8. If $a^2+b_2=c^2$ and $s=a+b+c$, prove that $(2s-a)^2+(2s-b)^2=(2s-c)^2$.

This question is incorrect.

9. Having 75 minutes at my disposal, how far can I go in a carriage at $6\frac{2}{3}$ miles an hour, having to walk back at $3\frac{3}{4}$ miles an hour?

Let x=distance in miles.

$$\frac{x}{6\frac{2}{3}}+\frac{x}{3\frac{3}{4}}=\frac{75}{60}\ :\ x=3.$$

10. I row a miles down a stream in b minutes and return in c minutes; find the rate at which I row in still water, and the rate at which the stream flows.

Let x=man's rate in still water, y= stream's rate per hour. Man goes down at $x+y$ rate, and up at $x-y$ rate; hence

$$\frac{a}{x+y}=\frac{b}{60},\quad \frac{a}{x-y}=\frac{c}{60},\quad x=\frac{b+c}{c-b}y,$$

$$x=\frac{30a(b+c)}{bc},\quad y=\frac{30a(c-b)}{bc}.$$

Algebra (Second Class.)

1. Find the value of $x^5+x^4-166x^3-166x^2+81x+81$ when $x=-7$; and the value of $x^3-3px^2+(3p^2+q)x-pq$ when $x=a+p$. (Arrange the latter result according to powers of a.)

The result can be obtained by substitution or by Horner's Method of Division.

The second part may be worked as under: In the expression put for x its value, thus,

$(a+p)x^3-3px^2+(3p^2+q)x-pq$
$=(a-2p)x^2+(3p^2+q)x-pq$;

again, put for x its value and reduce,

$(a^2-ap+p^2+q)x-pq$,

and so on, the result being a^3+aq+p^3.

2. What is the condition that $x+b$ shall be a factor of ax^2+bx+c?

Find the factors of

(a.) $(a^2-ab)+2(b^2-ab)+3(a^2-b^2)+4(a-b)^2$; and (b). $(ax+b)(bx+c)(cx+a)-(ax+c)(bx+a)(cx+b)$.

Put $x+b=0$, we have $ab^2-b^2+c=0$ for the condition.

(a) $(a-b)(8a-3b)$; (b) $x(1-x)(b-c)(c-a)(a-b)$.

3. What must be the relation among a, b, c that ax^2+bx+c may be a perfect square?

(a.) Extract the square root of

$(a-b)^4-4(a^2+b^2)(a-b)^2+4(a^4+b^4)+8a^2b^2$.

(b.) If 5 be subtracted from the sum of the squares of any four consecutive numbers the remainder will be a perfect square. (Prove this.)

Put the expression=0 and solve as a quadratic equation. Then the condition required is that for equal roots, viz.: $b^2=4ac$.

(a) $(a-b)^2-2(a^2+b^2)=-(a+b)^2$.

(b) Take for the consecutive integers $x-1$, x, $x+1$, $x+2$; we have

$(x-1)^2+x^2+(x+1)^2+(x+2)^2-5$
$=4x^2+4x+1=(2x+1)^2$.

4. If $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}$ and $\frac{h}{k}=\frac{l}{m}=\frac{n}{p}$

prove that

$$\frac{(a+c+e)(h+l+n)}{(b+d+f)(k+m+p)}=\frac{ah+cl+en}{bk+dm+fp}.$$

(a.) Reduce $\frac{ab(x^2-y^2)+xy(a^2-b^2)}{ab(x^2+y^2)+xy(a^2+b^2)}$ to its lowest terms.

(b.) If $xy+yz+zx=1$ prove tha

$$\frac{x}{1-x^2}+\frac{y}{1-y^2}+\frac{z}{1-z^2}=\frac{4xyz}{(1-x^2)(1-y^2)(1-z^2)}.$$

Let $\frac{a}{b}=x$, &c., $\therefore a=bx$, &c.;

$\frac{h}{k}=y$, &c., $\therefore h=ky$, &c.;

hence left-hand members$=xy$.

Also we have $ah=bkxy$, &c.=&c.;

$\therefore$ right-hand member$=xy$.

(a) $$\frac{ab(x^2-y^2)+xy(a^2-b^2)}{ab(x^2+y^2)+xy(a^2+b^2)}$$
$$=\frac{(bx+ay)(ax-by)}{(bx+ay)(ax+by)}=\frac{ax-by}{ax+by}.$$

(b) By simplifying the left-hand member of the equality the numerator is

$x+y+z-z^2(x+y)-y^2(x+z)-x^2(y+z)$
$+xyz(xy+xz+yz)$.

From the given equality

$z^2(x+y)=z-xyz$, $y^2(x+z)=y-xyz$, &c.;

$\therefore$ the numerator $=$

$x+y+z-x+y-z+4xyz=4xyz$,

which is the numerator of the right-hand member; and the denominators are the same.

5. Prove that

$$(a.)\frac{2\{x+2+\sqrt{(x^2-4)}\}}{x+2-\sqrt{(x^2-4)}}=x+\sqrt{(x^2-4)}.$$

$$(b.)\,(b+c-a)a^{\frac{1}{2}}+(c+a-b)\,b^{\frac{1}{2}}+(a+b-c)\,c^{\frac{1}{2}}=(a+b+c)(a^{\frac{1}{2}}+b^{\frac{1}{2}}+c^{\frac{1}{2}})-2(a^{\frac{3}{2}}+b^{\frac{3}{2}}+c^{\frac{3}{2}}).$$

(*a*) By rationalizing the denominator the required result is obtained.

(*b*) Remove the brackets, add and subtract $a^{\frac{3}{2}}$, $b^{\frac{3}{2}}$, $c^{\frac{3}{2}}$, and the answer can easily be obtained.

6. Solve the equations—

(*a.*) $(b-c)(x-a)^2+(c-a)(x-b)^2+(a-b)(x-c)^2=0$.

(*b.*) $x+y=4xy$; $y+z=2yz$; $z+x=3zx$.

(*c.*) $x+y+z=0$.

$ax+by+cz=0$.

$bcx+cay+abz+(a-b)(b-c)(c-a)=0$.

(*d.*) $\dfrac{x-1}{x+3}+\dfrac{x-3}{x+1}+2=0$.

(*a*) By inspection it can be seen that a is a root, and therefore b and c.

(*b*) Divide each side of the given equations by xy, yz, zx respectively, and we have

$$(1)\ \frac{1}{x}+\frac{1}{y}=4;\ (2)\ \frac{1}{y}+\frac{1}{z}=2;\ (3)\ \frac{1}{x}+\frac{1}{z}=3.$$

(1) − (2), $\dfrac{1}{x}-\dfrac{1}{z}=2$; add this equation to (3) and we get $x=\frac{1}{4}$; values of y and z are $\frac{1}{3}$ and 2 respectively.

(*c*) $x=b-c$, $y=c-a$, $z=a-b$.

This question can be solved by any of the ordinary methods of elimination, or by that of indeterminate multipliers, for which see Todhunter's larger Algebra, p. 120.

$$(d)\ \frac{x-1}{x+3}+\frac{x-3}{x+1}+2=0=1-\frac{4}{x+3}+1-\frac{4}{x+1}+2;\ \text{or, } 4=\frac{4}{x+3}+\frac{4}{x+1},$$

$$i.e.,\ 1=\frac{1}{x+3}+\frac{1}{x+1};\ x=1\pm\sqrt{2}.$$

Algebra (First Class).

1. If in $ax^2+2bxy+cy^2$, $ku+lv$ be substituted for x and $mu+nv$ for y, the result takes the form $Au^2+2Buv+Cv^2$. Find the value of $(B^2-AC)\div(b^2-ac)$ in terms of k, l, m, n.

On substituting as indicated in the question, we find the values of A, B and C to be respectively

$$ak^2+2bkm+cm^2,\quad akl+cmn+b(ku+lm),$$
$$al^2+2blu+cu^2;$$

$$\therefore B_2-AC=(ku-lm)^2(b_2-ac),$$

whence $\dfrac{B_2-AC}{b^2-ac}=(ku-lm)_2$.

2. Resolve $a(b-c)^3+b(c-a)^3+c(a-b)^3$ into factors.

Prove that

$$\frac{Au^3+Bv^3+Cw^3}{uvw}=\frac{Ax^3+By^3+Cz^3}{xyz}$$

if $u=x(By^3-Cz^3)$, $v=y(Cz^3-Ax^3)$,
$w=z(Ax^3-By^3)$.

By inspection $(b-c)$ is a factor, and so by symmetry are $(c-a)$ and $(a-b)$; so also is $a+b+c$. From consideration of dimensions there can be no other literal factor. Put the expression $=m(b-c)(c-a)(a-b)(a+b+c)$, assign any numerical values to a, b and c, and we find $m=1$.

Second part follows obviously from this resolution by substituting on left-hand side of equation values of u, v, w.

3. Extract the square root of $(a-b)^2(b-c)^2+(b-c)^2(c-a)^2+(c-a)^2(b-c)^2$, and the cube root of $4\{(a-b)^6+(b-c)^6+(c-a)^6-3(a-b)^2(b-c)^2(c-a)^2\}$.

Let $A=a-b$, $B=b-c$, then $A+B=a-c$, $\therefore$ square root of $A^2B^2+B^2(A+B)^2+A^2(A+B)^2$ is required, *i.e.*, of $(A^2+B^2)^2+2AB(A^2+B^2)+A^2B^2$, which is A^2+B^2+AB or $a^2+b^2+c^2-bc-ca-ab$.

4. Eliminate x, y, z from

$$ax+by+cz=1\qquad \frac{a}{x}=\frac{b}{y}=\frac{c}{z}$$

$$k(x^2+y^2+z^2)+2(lx+my+nz)+h=0.$$

$$\frac{a}{x}=\frac{b}{y}=\frac{c}{z}=\frac{a^2+b^2+c^2}{ax+by+cz}=a^2+b^2+c^2.$$

Subst. values of x, y and z in 3rd equation and we have

$$h(a^2+b^2+c^2)+2(al+bm+cn)+k=0.$$

5. Simplify $\dfrac{a\sqrt{b}+b\sqrt{a}}{\sqrt{a}+\sqrt{b}}$,

$$\{\sqrt{(4+3j)}+\sqrt{(4-3j)}\}^2,$$

and $\left(\dfrac{-1+j\sqrt{3}}{2}\right)^2+\dfrac{-1+j\sqrt{3}}{2}+1$

in which $j=\sqrt{(-1)}$.

$$\frac{a\sqrt{b}+b\sqrt{a}}{\sqrt{a}+\sqrt{b}}=\frac{(a\sqrt{b}+b\sqrt{a})(\sqrt{a}-\sqrt{b})}{a-b}$$
$$=\frac{\sqrt{ab}\,(a-b)}{a-b}=\sqrt{ab},$$

$$\{\sqrt{(4+3j)}+\sqrt{(4-3j)}\}^2=8+2\sqrt{19},$$
$$\left(\frac{-1+j\sqrt{3}}{2}\right)^2+\frac{-1+j\sqrt{3}}{2}+1=0.$$

6. Given the first term, the common difference and the number of terms of an arithmetical progression, find (1) the sum of the terms, (2) the sum of the squares of the terms.

(1) Book work.

(2) $S=a^2+(a+d)^2+\ldots+\{a+(n-1)d\}^2$
$$=na^2+d^2(1^2+2^2+\ldots+\overline{n-1}^2)$$
$$+2ad(1+2+\ldots+n-1)$$
$$=na^2+\frac{n(n-1)(2n-1)}{6}d^2+n(n-1)ad.$$

7. Solve the equations

(1) $(a-x)^3=(x-b)^3$;

(2) $ax+by=\frac{a}{x}+\frac{b}{y}=1$;

(3) $x(y+z^{-1})=a$, $y(z+x^{-1})=b$, $z)x+y^{-1})=c$.

8. What value (other than 1) must be given to q that one of the roots of $x^2-2x+q=0$ may be the square of the other.

If a, b, c are the roots of x^3-px^2+qx-r, express

$$\frac{2a^2b^2+2b^2c^2+2c^2a^2-a^4-b^4-c^4}{2ab+2bc+2ca-a^2-b^2-c^2}$$

in terms of p, q and r.

If $x^2-2x+q=(x-a)(x-a^2)$
$$a+a^2=2$$
$$a^3=q$$
$$\therefore q^{\frac{2}{3}}+q^{\frac{1}{3}}=2, \text{ whence } q=1 \text{ or } -8.$$

Given expression
$$=\frac{(a+b+c)(b+c-a)(c+a-b)(a+b-c)}{2q-(p^2-2q)}$$
$$=\frac{p(p-2a)(p-2b)(p-2c)}{4q-p^2}$$
$$=\frac{p(p^3-4pq+8r)}{p^2-4q}.$$

9. A vessel makes two runs on a measured mile, one with the tide in m minutes and one against the tide in n minutes. Find the speed of the vessel through the water, and the rate the tide was running at, assuming both to be uniform.

Let x=rate of vessel per hour;
" y= " tide "

$$\left.\begin{aligned}\frac{1}{x+y}&=\frac{m}{60}\\ \frac{1}{x-y}&=\frac{n}{60}\end{aligned}\right\} \quad \therefore\ x=30\left(\frac{1}{m}+\frac{1}{n}\right).$$
$$y=30\left(\frac{1}{m}-\frac{1}{n}\right).$$

10. Five points, A, B, C, O and P, lie on a right line. The distances of A, B and C, measured from the point O, are a, b, and c; their distances measured from the point P are x, y and z. Prove that whatever be the positions of the points O and P,
$$x^2(b-c)+y^2(c-a)+z^2(a-b)$$
$$+(b-c)(c-a)(a-b)=0.$$

We have
$$x=a+a,\ y=b+a,\ z=c+a,\ a=OP.$$

Proposed equation holds if
$$(a+a)^2(b-c)+(b+a)^2(c-a)+(c+a)^2(a-b)$$
$$+(b-c)(c-a)(a-b)=0,$$
if (since coeff'ts of powers of a cancel)
$$a^2(b-c)+\ldots+(b-c)(c-a)(a-b)=0$$
if $o=O$.

UNIVERSITY OF TORONTO.

Examination Papers: 1880.

FIRST EXAMINATION AND PRIMARY.

Prof. Pike's Chemistry Papers in Medicine.

Pass and Honours.

1. State the laws of the action of heat and pressure on gases. What volume will 100cc of gas measured at 10°C and under a pressure of 300mm of mercury occupy at 19°C and 762mm of mercury?

2. How may each of the oxides of carbon be converted into the other? Calculate the percentage composition of carbon monoxide and of carbon dioxide.

3. Write equations representing the action of heat on the following substances: Potassium Chlorate, Ammonium Bichromate, Ammonium Nitrite, Ammonium Nitrate, Manganese Dioxide, Lead Nitrate, Phosphorous Acid.

4. Boron Chloride and Stannic Chloride are said to contain respectively three and

four atoms of Chlorine: how may this be established?

5. What is the law of combination, in multiple proportion? Shew that the Oxides of Nitrogen conform to the law.

6. Give a short account of the chemistry of Silicon and its principal compounds. What element do you consider it most nearly resembles?

7. What meanings do you assign to the terms—acid, base, and salt? Compare the substances represented by the formulæ:— H_2SO_4, $NaHSO_4$, SO_2, N_2O_4, HNO_3, As_2O_3, $KAsS_2$, Na, AlO_3.

Second Year.

1. Give a brief account of the origin of the term Organic Chemistry.

2. How may the presence of Nitrogen, Hydrogen, and Iodine, be detected in an organic compound?

3. The analysis of a hydrocarbon leads to the formula C_nH_{2n}. What experimental evidence would enable to assign a particular value to n in the above formula?

4. Give the general methods of preparation and characteristic reactions of the alcohols. What class of bodies in inorganic chemistry do they most nearly resemble?

5. A mixture of the gaseous hydrocarbon C_2H_6 with excess of Oxygen is exploded in a Eudiometer. What alteration of volume will occur?

6. By what reactions can we distinguish between the primary, secondary, and tertiary alcohols?

7. The reactions of organic acids are explained on the hypothesis that all acids contain the group $-C\lessdot^{O}_{O-H}$. Shew that this is probable in the case of acetic acid.

Third Year.

1. On boiling a substance with concentrated hydrochloric acid, chlorine is evolved: what compounds do you know by which this reaction may be caused? Give equations expressing the reaction in every case.

2. Give a full account of the methods of identifying the acid and base in each of the following salts: lead chromate, aluminium fluoride, manganous phospate.

3. By what reactions can we distinguish between hydrochloric, hydrobromic, and hydroiodic acid, and between ferrous and ferric salts.

4. Describe experiments to shew that (1) sulphuric acid contains oxygen, and (2) that hydrodic acid contains iodine, (3) that ammonia contains nitrogen.

5. Neutral solutions of the salts of certain acids with the alcalis are precipitated by a solution of barium chloride. Give the formulæ of the substances produced.

6. The gas from a Marsh's apparatus is passed into a solution of silver nitrate: What reactions will occur if (1) hydrogen arsenide, (2) hydrogen antimonide are present? Give a comparison of the properties of the spots deposited on porcelain in each case.

7. Iodic acid, sulphur dioxide, and free chlorine, are frequently impurities of commercial nitric acid, sulphuric acid, and hydrochloric acid respectively. Describe methods of testing for these impurities.

Third Year and M.B.

1. How would you recognize a gas to be (1) Nitrous Oxide, (2) Oxygen, (3) Nitrogen?

2. Describe a method of preparing Nitric Acid: write equations shewing its action on (1) Tin, (2) Copper, (3) Phosphorus, (4) Ferrous Sulphate, (5) Sulphur Dioxide. How could Nitric Acid be shewn to contain hydrogen?

3. By what reactions can you distinguish between a Chlorate, Nitrate, Nitrite, and Bromate; and also between Ferrous and Ferric Salts?

4. Explain, giving an instance, how the determination of the specific heat of an element may be used to ascertain the atomic weight.

5. What volume (measured at 0°C and 7.60^{mm}Bar.) of hydrogen will be set free by the action of 20 grms of zinc on excess of

sulphuric acid. What will be the volume of the steam measured at 100°C and 750^{mm} Bar. produced by burning this hydrogen in oxygen.

6. Give some account of the oxychlorides, and oxygen acids of sulphur.

7. What experimental evidence enables us to decide the atomic weight, atomicity, and molecular weight of phosphorus?

8. In case the atomic weight of phosphorus were altered to 10.3 (one-third its present value); what formulæ would express the compounds: magnesium pyrophosphate, phosphorus trichloride, phosphorus oxychloride, and phosphorous acid?

Degree of M.B.

1. By what chemical and physical characters would you recognize a substance in analysis to be, (1) amorphous phosphorus, (2) sulphur, (3) iodine.

2. Describe the preparation of hydrogen sulphide, and give equations representing its reactions with acid solutions of the following substances: chlorine, ferric chloride, sulphur dioxide, chromic acid, arsenic acid, and arsenious acid.

3. Give the formula of the precipitates which occur when solutions of ammonia, ammonium chloride and ammonium sulphide, are added to solutions in dilute hydrochloric acid of the compounds indicated by the following formulæ:

Fe_2Cl_6, Al_2Cl_6, Cr_2Cl_6, $Ca_3(PO_4)_2$, Fe_2Cl_4, $MnCl_2$, $SnCl_2$, CaF_2, BaC_2O_4.

4. What compounds of the following elements do you consider the most characteristic: boron, silicon, zinc. How could you prove their presence in the following compounds: borax, hydrofluosilicic acid, zinc oxide.

5. Describe a method of detecting the presence of barum, strontium and calcium in a mixture containing the chlorides of these elements.

6. What impurities would be most likely to occur in (1) commercial potassium iodide, (2) iodine. What tests would you apply to detect these impurities?

At a recent teachers' meeting a pretty discussion arose as to when definitions in arithmetic should be taught. One argued that each fundamental operation should be finished up both in theory and practice before going to the next. Another contended, with apparently greater force, that children should be taught to do first and to reason afterwards. Practice before theory; work before philosophy; first the *how* then the *why*. This seems to be the true doctrine for graded schools.—*Chicago Educational Weekly.*

True. Indeed is it not the true doctrine for *all* schools, whether graded or ungraded? But what has this to do with definitions in arithmetic, which are, or should be, a mere formulating of the pupil's knowledge? A definition has nothing to do with the *how* or the *why*, but with the *what*.

The Ontario Teachers' Association meets in the Theatre of the Normal School on the 10th of August, and following three days. We are pleased to notice that besides the President's inaugural there will be addresses from Prof. Goldwin Smith, of Toronto, and Prof. J. E. Wells, M.A., of Woodstock.

The Education Society for Eastern Ontario is holding its annual meeting at Perth. We shall give *résumé* of its proceedings in our next.

The important and exhaustive speech on educational matters of Chancellor Blake at the late Convention of the University of Toronto, has, we regret, been crowded out of our pages in the present number. We shall reproduce it in our next.

PUBLIC SCHOOL DEPARTMENT.

[Contributed to, and under the management of, Mr. S. McAllister, Headmaster of Ryerson School, Toronto.]

BRITISH EDUCATION REPORT FOR 1879.

We subjoin some statistics from this Report that will be of interest to our readers.

	England and Wales.	Scotland.
Attendance—		
Registered	3,710,883	308,452
Average	2,594,995	385,109
Percentage of scholars who attended the whole year	70	76
Percentage of school population who attend no scho'l	20	25
Number of schools	14,027	3,003
Cost per pupil in average attendance	£1 18 3¼	£2 0 9
Teaching Power—		
Certificated teachers	29,716	5,148
Assistant "	6,616	357
Pupil "	33,195	4,648
In training colleges	3,108	970
Average Salaries—		
Of masters	£120 11 3	£139 3 0
" mistresses	72 3 2	72 6 4
Percentage of Scholars who passed the Inspector's examination—		
In reading	87.52	91 8
" writing	80.08	88.9
" arithmetic	73 87	82.42
In the three subjects	61.6	73.2

As the Government pays for results in the three R's, our readers will infer that the Scottish earned considerably more than the English schools; the difference in favour of Scotland was, in fact, between three and four shillings per scholar. There are certain subjects—as grammar, geography, history, and needlework—for excellence in which special grants are made, and as there is danger of trying to win these by cramming, the Report contains some pertinent remarks upon school training that are well worth quoting:—

"In the short school life of our children, they cannot, at the best, do more than gain a superficial acquaintance with a few subjects of study. But a habit of observation, and of careful connected reading, with a love of acquiring knowledge, may well be begun in school, and if begun, will often be continued when the children leave it. This is not likely to be the case under the system hitherto too often pursued of teaching 'class subjects' through *lectures*, assisted by home lessons taken from short skeleton manuals, labouriously learnt by heart, and then easily forgotten. This part of the instruction of our schools must henceforth be given on a better system; and we hope that the change in the Code, while increasing the amount and improving the methods of teaching in the school-room itself, will cause greater attention to be paid to the production of school-books, which, appealing to the interest and intelligence of the children, will not only improve their minds, but inspire them with the desire to extend and deepen their knowledge by a habit of continuous and useful reading after they leave school."

THE PERMIT SYSTEM.

Is IT not time that this "one-horse" way of securing teachers for some of our schools should be abolished, or so restricted that our schools should not be found a refuge for either the incompetent or the idle? The country pays a large sum yearly for the training and examination of teachers, and at present there are more teachers than there are schools for. We do not think we are asking too much to have the schools taken charge of by those who are properly qualified to do so. It may be said, and perhaps with truth, that many of those teaching on permits are more fitted to manage a class and to advance their scholars in the modicum of knowledge they are expected to acquire than a large number of certificated teachers. But would it not be better to make special cases of these, and grant them permanent certificates upon the recommendation of the County Inspector and some other officer, nominated by the Minister of Education, such as the Model School Inspector, whom we hope to see ere long appointed as one of the permanent staff of the Education Department?

The granting of permits at present lies mainly in the hands of the County Inspector and the Minister, and is the source of bitter accusations of favouritism, partiality and nepotism against the one, and of political jobbery against the other.

If permits are to continue, and Mr. Crooks has no desire to let politics or anything else but the welfare of education guide him in granting them, let him have the recommendation of his own responsible nominee as well as that of the County Inspector. We will then have the air cleared of the accusations we have heard hurled against both himself and the unlucky Inspectors.

THE PUBLIC SCHOOL SECTION OF THE PROVINCIAL ASSOCIATION.

THE Committee entrusted with the duty of providing work for the Public School Section at the next meeting of the Provincial Association, which begins on the 10th of August next, has determined that the members attending it shall not be idle. The following is a list of the subjects proposed for discussion, with the names of their introducers:—

1. Recent Legislation.—W. B. Harvey.
2. Uniformity of Text-books.—S. S. Herner.
3. Representation at the Provincial Association.—F. W. Chapman.
4. Means of Supply of Teachers.—H. Dickenson.
5. Rotation of Examiners.—Samuel McAllister.
6. Is any change in the Superannuation Fund desirable?—R. Boyle.

Three at least of these subjects—the second, third and sixth—have been before the Association at previous meetings, and the fact of their being put upon the programme for the present year is an indication of the importance attached to them by the profession throughout the country. It is to be hoped that the efforts to make the Provincial Convention an assembly of delegates will be advanced by the deliberations at the approaching meeting. The important points to be decided before a re-organization of the Association can take place are:—1. The number of delegates to be sent from each local Association. 2. Upon what basis High School teachers and Public School inspectors are to be represented. It may be at once conceded that if the Association is to contain a fair portion of the most active-minded and intelligent educationists of the country, we cannot have representation according to numbers. This would give a large preponderance to Public School teachers, and a trifling representation to inspectors. The wisdom of the Public School Section and of the general Association will be well employed in devising a plan by which High School teachers and inspectors may be fairly represented at the same time that the Public School element will have its great predominance in numbers equitably recognized.

The present method of superannuation has two radical faults: the sixty years' limit in active service, and the smallness of the allowance made to worn-out teachers. No one, not even the Minister of Education himself, pretends that the present allowance is sufficient to induce a competent teacher to remain in the profession to take the benefit of it when he has to retire. It bears so small a proportion to his salary, little as that may be, that he does not anticipate much pleasure in the enjoyment of it after his life of toil, for the simple reason that it will only partially relieve him of the anxieties of keeping the wolf from the door.

We have already expressed our opinion that teachers would be quite willing to increase their annual contribution in order to secure an allowance large enough to enable them to end their days in comfort. Until the privilege of retiring after a shorter term of service be conceded, and the allowance be increased to an amount that indicates a fair valuation of the character of the services performed and of their duration, the good sought by the establishment of the Superannuation Fund, either in securing competent teachers for our schools, or in inducing them to remain in the profession, will not be accomplished.

The discussion that took place upon the question of the "Uniformity of Text-books," at the last meeting, shewed that there was considerable danger in meddling with the present plan. If there were no restriction upon the use of text-books in our schools, many of our boards and of our teachers would become the victims of enterprising and unscrupulous publishers. If we were certain that every board or every teacher was competent to form a sound opinion upon the books to be used in the schools, there would be less objection to giving latitude in the choice of text-books. But even then there would be danger of a serious evil which a United States visitor forcibly illustrated at the last meeting, when he stated that he knew of a school in Pennsylvania in which sixteen different text-books in geography were used. The chief objection to uniformity of text-books is that the best book may not be authorized for the work that has to be done. The only way to get rid of this, or, at all events, to minimize it, is to have a thor-

oughly competent, trustworthy and responsible tribunal, that should have the confidence of the profession and of the country, to select and prescribe for use text-books that have other excellencies to recommend them than mere points of detail. Such a tribunal we are in hopes the present wave of public opinion will secure. The discussion of the matter in the Public School Section, if intelligently conducted, will be of the greatest use in indicating what will satisfy the teachers.

"Recent School Legislation" will prove fertile enough to talk about, but barren of results. The mischievous change in the law, allowing the summer holidays to be shortened in rural sections, is at present beyond Mr. Crooks' power to cancel. If any efforts are to be put forth against it, they must be used with the local Members to have effect. We would like to have seen "Recent Regulations" substituted for or joined with "Recent Legislation" as a matter for discussion. Opinion could then have been brought to bear upon the important changes that have been made within the last year in the regulations for the examination of candidates for teachers' certificates. The substitution of the intermediate for the ordinary third-class examination is in accordance with a resolution passed in the Public School Section at the last meeting. The alteration in the work for 1 A and 1 B certificates is made, we suppose, in response to previous strongly-expressed opinions at the meetings of the Association. If the work required for a 1 C be searching enough —and this it may be without being made absurdly difficult—the options granted for the two higher grades are reasonable, but if it be shallow in its character, and the examination becomes a test that can be satisfied by mere cramming rather than by well-arranged and well-digested knowledge, the change will prove not for the better, but for the worse.

"The Supply of Teachers" is a matter that is engaging the serious attention of the profession in England, and from the numbers that are flocking to our examination halls to become qualified to teach, the means of supply is well worthy of consideration. The first plan that occurs to most minds to check an over supply, is raising the standard of scholarship; but this is not necessarily accompanied by an improvement in the capacity to teach, for the best scholars are far from being always the best teachers. Another and a better way of accomplishing the same result with us is to prolong the apprenticeship of each pupil-teacher before entrusting him with the responsibility of a class or of a school. Several important advantages, besides the one sought, would result from this plan, and these, we have no doubt, will be pointed out when the matter is discussed.

The High School Section dealt with "Rotation of Examiners" in a very mild way at its last meeting. But nothing will satisfy the wants of our public school system except a method of choosing examiners similar to that prevailing in most Universities.

THE LATE EXAMINATIONS.

It would be impossible, of course, for the examinations held under the Department to take place without some blunder in the time-table. We remember, at one examination in the winter, a presiding examiner was fain to ask if he could be supplied with lamps, as the candidates were given till five o'clock p.m. in one subject. The time-table for the recent Third-Class Examination required the work to begin on Tuesday morning, but provided none for that afternoon, and thus was taken into Friday morning what could well have been finished on Thursday afternoon. A loss was thus entailed upon candidates and examiners of hundreds of dollars in hotel accommodation.

Next to the labour of examining papers is that of preparing questions, and a conscientious examiner will not consider any labour ill-spent that secures transparency of meaning in his questions, even at the expense of brevity in his style. Some papers put at teachers' examinations in past years have erred grievously in their obscurity, and we fear those put at the recent examinations have been no exception. Many a Third Class candidate was puzzled over the meaning of the first sentence of the fourth question in the arithmetic paper, and we know as a fact that some of them had to ask the presiding examiner what it meant. The mere altering of a word or two on the part of the examiner who drafted the paper would have saved a good many minutes' labour to anxious candidates. This examiner is, however, an old offender in this respect, and is, we fear, past reformation.

HIGH SCHOOL DEPARTMENT.

UNIVERSITY AFFILIATION.

Two Institutes have, we understand, applied to the Senate of the University of Toronto for affiliation. This new departure has, we believe, been caused by the existence of a regulation which precludes the winner of a scholarship from holding it unless when in attendance at an affiliated institution, and by the absence of any provision for the higher education of women, these institutes claiming that they have made such provisions of a suitable character. Affiliation has been granted to the Woodstock Institute on condition that its students will not become candidates for scholarships at Junior Matriculation. The necessity for this restriction is not obvious, and there can be no doubt that the Institutes referred to would refuse affiliation on such conditions. In our next issue we shall discuss this subject.

BOGUS ADVERTISEMENTS.

No one can object to a Head Master advertising the advantages offered by his school and the record of the achievements of his pupils. To what extent this is to be done is a question between his Board and his constitutional modesty. But a mode of advertising has of late been adopted that is decidedly unprofessional. It is an axiom amongst reputable teachers that a school is only entitled to the credit of work actually done in its class-rooms. A degree of lustre is, no doubt, shed upon it by the subsequent successes of its pupils, but for a school to claim, without a word of explanation, the credit of the success of a former student at the examination for call to the Bar, or, say, for a gold medal in Natural Science obtained at Graduation, "and the same with intent to deceive," is simply extorting credit under false pretences.

SCHOLARSHIPS TO WOMEN.

We are happy to be able to announce that, at the last meeting of the Senate of Toronto University, a statute was passed that does away with the restrictions against women holding scholarships. The statute is, we understand, intended to be retrospective also; so that Miss Chisholm, of the Hamilton Institute, and Miss Charles of the St. Catharines Institute, will now, we presume, receive the amount of the scholarships, the honour only of which they have hitherto enjoyed. We heartily endorse this action on the part of the University Senate. It will do much to encourage the growth of the present movement on behalf of the higher education of women, and is only justice to the young ladies who have so highly distinguished themselves.

THE INTERMEDIATE.

For the last half year of 1879 the per caput Upper School Grant was $4. The probability is that for last half year it will be about $2 or $2.50. As the High School Intermediate Examination—pure and simple—is admittedly of no use as a means of classifying pupils, as in very many localities it will cost more to hold the examination than the amount of the Upper School Grant based thereon, and as this examination is a hindrance to education in many localities, and, we make bold to say, a serious drawback in many of the schools that do the higher class of work, perhaps some admirer of what the High School masters as a body regard as an unmitigated nuisance, will oblige us by demonstrating the necessity for its continued existence.

TEACHERS' CONVENTION.

PROGRAMME FOR HIGH SCHOOL SECTION.

August 10th.—9.00-12.00.—*Text Books and Departmental Examinations*, introduced by H. I. Strang, B.A., High School, Goderich, and D. C. McHenry, M.A., Coll. Inst., Cobourg.

August 11th.—9.00-12.00.—I. *Legislative Aid for Secondary Education*, introduced by A. Purslow, B.A., LL.B., High School, Port Hope, and A. P. Knight, M.A., Coll. Inst., Kingston.

I. *High School Regulations.*—Geo. H. Robinson, M.A, High School, Whitby.

August 12th.—9.00–12.00.—I. *The University and the High Schools,* introduced by J. Millar, B.A., Coll. Inst., St. Thomas.

II. *General Business.*

It is very desirable that there should be a large representation from all parts of the Province, as the meeting bids fair to be one of the most interesting and important that have as yet taken place. We hope to see a full attendance on the first morning of the Convention. The Section will meet in one of the rooms in the Normal School Building.

SUBJECTS OF EXAMINATION FOR 1881.

At the examination for First Class teachers' certificates in July, 1881, Gray's "Elegy" and Goldsmith's "Traveller" will be replaced by Scott's "Lady of the Lake," with special reference to Cantos V. and VI., the rest of the programme for Grade C to remain as before. The following circular respecting the subjects for the Intermediate in July, 1881, has just been issued by the Department of Education :—

The works prescribed in English Literature for the Intermediate Examination in July, 1881, are Scott's "Lady of the Lake," with special reference to Cantos V. and VI., and Addison's "Sir Roger de Coverly" (as reprinted by W. & R. Chambers).

Latin: The Accidence and the Principal Rules of Syntax and Prosody; Exercises; Cicero in Catilinam, II., III., IV., and Virgil, Æneid, B. I., 1-306; Learning by heart selected portions of Virgil; re-translation into Latin of easy passages from Cicero.

French: The Accidence and Principal Rules of Syntax; Exercises; De Fivas' Introductory French Reader, p. 49 to end; Bonnechose, Lazare Hoche; Re-translation of easy passages in French; Rudiments of Conversation.

German: The Accidence and Principal Rules of Syntax; Exercises: Adler's Reader, 1st, 2nd, and 3rd parts; Der Gang nach dem Eisenhammer (Schiller); Die Kraniche des Ibycus (Schiller); Re-translation of easy passages into German; Rudiments of Conversation.

The other subjects as before.

SECONDARY EDUCATION.

In view of the discussion to take place on the subject, "Legislative Aid to Secondary Education," the following analysis of the Honors, etc., won by the different classes of schools at the Toronto University examinations in 1878, 1879, and 1880, will no doubt prove useful to those who wish to compare the amount and character of the work done in these institutions:

FIRST AND SECOND CLASS HONORS.

	Coll. Inst's.		High Schools.		U.C.C.		Private Schools.	
1880.	1st.	2nd.	1st.	2nd.	1st.	2nd.	1st.	2nd.
Classics	5	5	0	2	1	3	1	0
Mathematics	8	5	6	12	0	2	2	1
English	5	12	3	12	2	4	0	0
History, etc	5	10	3	5	3	1	0	0
French	1	12	0	8	0	5	0	1
German	7	0	5	0	3	0	0	0
Total	31	44	17	39	9	15	3	2
1879.								
Classics	7	7	2	3	1	2	0	0
Mathematics	17	1	12	11	1	1	3	1
English	22	10	10	13	3	4	1	3
History, etc	6	17	5	9	3	3	1	1
French	7	11	5	3	4	3	0	1
German	5	6	3	0	2	4	0	1
Total	64	52	37	39	14	17	5	7
1878.								
Classics	4	12	2	5	2	3	0	0
Mathematics	8	0	6	0	2	0	0	0
English	7	10	2	9	0	6	1	0
History, etc	9	17	1	11	2	2	1	2
French	8	10	2	5	2	3	0	2
German	7	4	1	1	3	0	0	1
Total	43	53	14	31	11	14	2	5

Total number of matriculates—				
1880	95	39	11	6
1879	131	52	12	12
1878	95	51	9	8

SCHOLARSHIPS.

Junior Matriculation.

Total awarded—				
1880	9	8	1	0
1879	9	7	1	0
1878	8	5	1	0

Senior Matriculation.

1879	3	1	0	1
1878	3	3	0	0

At the First examination of Toronto University in 1880 four students prepared at the Collegiate Institutes obtained the first and third places in General Proficiency, the third and fourth places in First Class Classics, the first place in Mathematics, the eleventh and fourteenth places in English, the first place in French, and the first place in German; the first and third scholarships in General Proficiency, the Mathematical scholarship, and the Modern Languages scholarship.

The other results for 1880 are as follows:

FACULTY OF MEDICINE—1880.

	C. I's.	H. Schs.	U.C.C.
No. passed, 6	3	1	2
Honors, 1st Class	2	0	0
" 2nd "	2	0	1

Local Examinations for Women.

	C. I's.	H. Schs.	Priv.
No. passed, 37	3	24	9
Honors, 1st Class	4	0	2
" 2nd "	5	0	13

We hope to be able to give our readers similar analyses of the results at Kingston and Cobourg. The above, however, may, we think, be taken as a pretty reliable exhibit of the work done in our secondary schools.

THE LATE DEPARTMENTAL EXAMINATIONS.

SOME time ago an article appeared in this journal entitled "Departmental Reports and the Intermediate," in which strong objection was taken to the character of the English papers for the Intermediate, on the ground that too little importance had been attached to composition. The examiner has this year adopted a plan which, though somewhat unusual, cannot fail to do much to obviate the difficulty that existed. About one-third of the total value of the correct answers in Grammar and Literature has been assigned to "Literary Form." An examiner, if he knew his duty and did it, would, under any circumstances, attach considerable importance to this feature, and it is to be hoped that this has hitherto been done by the sub-examiners; but we believe that the course pursued this summer will direct more attention to the subject on the part of both teacher and pupil than has hitherto been paid to it. The objection raised against the former mode of examination has now been fairly met, and we anticipate good results from the change. But Literature and English Grammar are not the only subjects in the treatment of which good literary form is desirable. Although the necessity for this exists in varying degrees in most of the subjects of the examination, there is none in which correct modes of expression are more important than in the answers to the History paper. Indeed, on it an unusually good opportunity is presented of estimating the judgment and culture of the candidate. We should, therefore, have expected to find in marking it the same system adopted. It may have been intended that the Literary form should be an important element in estimating the values of the answers in History. The omission this year is, therefore, particularly unfortunate. It may not here be out of place to impress upon the Central Committee the necessity for uniformity of method in setting the papers and in valuing the answers. It is evident that this summer there has been no concerted action in the case of two of the examiners at any rate. The chairman of the committee, himself a good general scholar, might attend to this matter and secure not only uniformity of method but the preparation of papers of about the same degree of difficulty in the different subjects. It is notorious that every year there is, through no fault of the candidates, a general failure in some one or other of the papers. One year it is the Arithmetic, another the Algebra, and this year the honour is equally divided between the Arithmetic and the Literature. This is unfair. We contend that the standard in all subjects should remain uniform as far as possible, and that it is impolitic to alter it without due notice being given. Everyone will admit that the Intermediate Literature paper of this year is more difficult than any that have hitherto been set, and that in avoiding "cram" work the examiner in Grammar has gone to the other extreme. The spirit that has dictated these changes is the proper one; our examinations must not run in grooves; but in the effort to do his duty in this respect the examiner often falls into the error of making his questions unusually difficult. Those remarks apply with equal force to other Intermediate papers—to the Arithmetic in particular—and the present state of matters is an additional reason for "introducing new life" into the committee. It is gratifying to know from an authoritative source that a change of this nature is desired even by the members of the committee, and we look to the Minister to afford them speedy relief. The papers for First Class C present exaggerated forms of the defects to which the present system is liable. The Algebra, Natural Philosophy, Grammar, and History papers, are objectionable, but for different reasons. The paper in Philosophy is unusually and disproportionally easy; the Algebra may be regarded as its offset. The latter paper would not have been set by an examiner who understood his business. In Mathematics, particularly when a course is prescribed, it is only proper that the questions should cover it. To set all or nearly all the questions on the first half of the subject is as bad as to set them on the last half. Our examinations are not competitive, and the Minister has given special instructions to the Departmental examiners that their duty is to find out simply what the candidate knows. This, we assert, is not done by the examiner confining himself to the more elementary part of his subject. Such a course is as unfair to the candidate who has mastered the whole of the subject as it is to the one who has not been able to make himself acquainted with the more advanced portions. The Algebra paper is objectionable on this score. Further, several of the questions require more muscle than

brains, and there seems to be a desire to make up by the catchiness of some of them for the defects of others. We recommend to the examiner a diligent study of the junior and senior matriculation papers of Toronto University. The Central Committee is notorious enough already without him trying to make it more so. The English Grammar and History papers are well constructed, but they are altogether too long for the time allowed. This is an error Mr. Marling is sometimes guilty of, and it is one that produces most uncomfortable and unchristian feelings in the minds of candidates. If the papers count over the maximum no objection can be taken; but no notice has been given to this effect. We may remark in conclusion that it is a rather curious circumstance that the regulations in regard to the percentage of marks required for a C had not been made when the examination took place. This is an omission that should not have occurred. Having accustomed candidates at these examinations to a full account of what they have to expect, the Department should have arranged and published the details relating to the different grades of First Class certificates.

CONTEMPORARY LITERATURE.

THE ESSENTIALS OF ELEMENTARY CHEMISTRY AND CHEMICAL PHYSICS, for the assistance of High School Students and Intermediate Candidates, compiled and collated by A. W. Aytoun Findlay, Science Master, Brantford Collegiate Institute, etc. Toronto: W. Warwick & Son, Publishers, 1880.

WE cannot say that we are favourably impressed with the appearance of this contribution to our school literature. The desire on the part of the author and his publishers to furnish candidates for Departmental Examinations with a cheap manual has led them into errors that will detract from its value as an educational appliance. Its genesis "in notes collected at various times from many sources" as the preface tells us, sufficiently accounts for the conglomerate character of the matter, and there is an evident and well meant desire to give as much value as possible for the money, which has led to overcrowding and defective mechanical execution. The literary form of the work is, under the circumstances, highly creditable; but in a manual which covers so much ground means should have been taken by difference of typography or in some other way to distinguish the important from the unimportant. In view of the requirements of our school examinations objection, therefore, may fairly be taken to the scope of the work: it is too comprehensive for the use of candidates for Second Class Certificates, and it does not meet the wants of candidates for First Class. In treating also of the different parts of the subject there is not that uniformity of method which is essential in a text book. To illustrate; in discussing oxygen, there is given on p. 66 a series of experiments, but this valuable feature nowhere else occurs in the same desirable form. The arrangement of the matter is also, in our opinion, very defective. To use a printer's term, the pages are too "fat," and that help which proper paragraphing can give the reader is here withheld.

A few of the errors that occur in this volume are evidently typographical. For example on page 151 "phosphorus acid" occurs for "phosphorous acid;" but there are others that are not attributable to the printer. If the derivations of the names of the elements are to be given at all, they ought to be both explicit and accurate. The term, antimony, for instance, is better derived from *anti* and *moine*, as if "monk's bane," than from *anti* and *monos*. To mention the Latin *sulphurium* for sulphur is not very satisfactory instruction in Etymology. To have given *sal*, salt, and *pur*, fire, with a little more explanation, would have placed the matter in a much clearer light. Again, on pp. 100 and 101 the reader finds the expression "Carbonic" employed for either "carbon dioxide," "*carbonic anhydride*," or "*carbonic* acid gas;" also on pp. 134- 5- 6- and -7, "sulphurous acid" for "sulphur dioxide," or "sulphurous anhydride;" and on p. 154

"phosphoric acid" for "phosphorus pentoxide,"—a deficiency in method which is apt to confuse the beginner. In defence of the use of the terms "carbonic acid," "sulphurous acid," and "phosphoric acid," in such connection, it may be urged that they were formerly employed as names for the above mentioned oxides. Granted; but they are not correct terms when applied in this way, none of said oxides having the properties of an acid. Besides, there are real acids that now bear these names, and, therefore, it becomes highly inconvenient to use but *one* name for *two* different chemical substances. Then, on p. 160 the following passage exists: "Arsenic is rarely found native, but generally in union with iron, cobalt, copper, or nickel ore, or with sulphur." Is the arsenic found in union with the *ore* of the nickel, etc.? If so, we must consider the substance thus found to be "nickel ore plus arsenic." This, however, is not its true name, for to the whole substance including arsenic, nickel, cobalt, iron, etc., mineralogists invariably give the name "nickel ore." Objection may likewise be offered to a statement on p. 194, in which notwithstanding its organic nature and origin, it is asserted that coprolite is a *mineral*.

However, the gravest errors of the text-book are in relation to hydrogen, oxygen and nitrogen. That the author should be so far behind the times as to be unacquainted with the fact that these elements, which are gaseous at ordinary temperatures, have been condensed to the liquid condition, seems almost incredible. Yet such is the case. On turning to p. 64 we perceive the assertion that "oxygen is not condensible to a liquid;" p. 68 "hydrogen is not condensible to a liquid;" and p. 79 "nitrogen is not condensible to a liquid." The compiler and collater was plainly ignorant of the issues of those brilliant and successful experiments upon the aforesaid gases by M. Pictet in Geneva, and M. Cailletet in Paris, some two or three years ago. In the winter of 1877 and 1878 the scientific journals of Europe and America gave lengthy and detailed accounts of the apparatus and methods employed by these gentlemen in the condensation of the said gases to the liquid and then to the solid condition by great cold and pressure. Hydrogen when solidified was stated to be a somewhat bluish metal, while oxygen and nitrogen presented the appearance of non-metallic substances. That hydrogen is a true metal had long been believed by many chemists, because of its action in displacing other well-known metals in combination. Hence, we are considerably surprised to discover in a book published during the present year, and claiming as one of its "merits" that "it represents the latest results of the labours of the highest authorities in chemical and physical science," not only that hydrogen is discussed as a non-metallic substance, but also that hydrogen, oxygen and nitrogen are positively affirmed to be uncondensible gases. It may be as well also to remind the author that hydrogen has been found in a free state in "meteoric iron," in the solar atmosphere, and with volcanic gases.

Of course it would not be fair to hold Mr. Findlay responsible for the character of the Departmental Examination questions in chemistry which he has published at the end of his volume. It is only right, however, to say that in restricting himself to them the compiler has committed a serious error. What is wanted at present in connection with the study of chemistry in our High Schools is a good collection of examination papers, and, when one considers that Mr. Findlay might have availed himself of the labours of Thorpe, Wilson, Tilden, Williamson, etc., there is reason to regret that he did not pursue in the compilation of this part of the volume the system adopted in the rest.

In reference to question 8, p. 174, "Describe any two experiments you have performed yourself and the purpose for which you performed them," the author, curiously enough, under the heading "Ans." proceeds to say that "this question ought sufficiently to impress the student with the necessity for practical work." It is by no means clear that this would be the effect of such a

question. As a matter of fact very satisfactory answers have been given by students whose knowledge of chemical manipulation was derived from books and observation.

Although the author in his preface tells us that it has not been his desire "to adopt a mechanical method of question and answer, but, except in special cases, simply to assist the student in finding the answer for himself by directing him to the paragraphs where they will be found," he has given very elaborate solutions where they are unnecessary from any point of view, and has in some cases withheld help where it might reasonably be expected. As cases in point, we would refer amongst others to the solutions to 7, p. 172, and 1, p. 178, where an exemplification of the principle is all that is called for. No. 42, p. 196, is answered by referring to par. 37, where, we may say, the subject of *radicals* is imperfectly treated. By answering this question in detail Mr. Findlay might have given the subject a clearness it does not there possess. Some of the solutions are evidently incorrect. The answer to (3), 3, p. 179 is not the weight of the *commercial acid;* in (1), 2, p. 181, the volume of the O should be deduced from the conditions of the problem, and not from what is proved in par. 98; the answer to 3 in the same page is somewhat peculiar—Ammonia is neither nitric acid nor a nitrate; and to conclude, the answer to 33, p. 192 does not cover the ground intended; for the meaning at one time given to HO is not therein explained. When an author undertakes to solve a problem his answer should be a model of accuracy and of style. This requirement is not fulfilled in all cases in this collection.

We have spoken out plainly in reference to this manual. While we have called attention to some of its defects, we have done so in no censorious spirit. The book contains a great deal of valuable information and is in many respects creditable to the author; but if we are to succeed in our new-born zeal for native literature, we must set before us a high standard of excellence. The mistakes pointed out are not of so serious a nature as to materially affect the usefulness of the book as a whole; and we, therefore, hope that when the work reaches a second edition Mr. Findlay will avail himself of a criticism which has been penned in no unfriendly spirit.

MISTAKES IN TEACHING, by J. L. Hughes, Inspector of Public Schools, Toronto.

ATTENTION: HOW TO SECURE AND RETAIN, by the same. W. J. Gage & Co.'s Educational Series. Toronto, 1880.

WE are a little at a loss to imagine to whom Mr. Hughes supposes these manuals will prove of any service. We should think that the teachers of the Province were at least competent to elaborate sufficient commonplaces for home consumption, without needing to buy them in bulk. Certainly we should be disappointed if we found that any of the profession were under the delusion that commonplaces ceased to merit that homely name when honoured with the *imprimatur* of a Public School Inspector, and forming part of a so-called educational series. The style of informtion given may be inferred from the following:

"*It is a mistake for a teacher to stand on his head during lessons.* Although this practice may not strike every one as being necessarily a mistake, yet a little consideration will lead the candid reader to decidedly condemn it as such. It is true that it has a marked effect in riveting the attention of the scholars, but this effect is not a permanent one, and the gaining of the attention does not, in this instance, conduce to any distinctively educational aim. On the whole we would suggest, but without laying down any positive rule, that the exigencies of discipline require the teacher to do what standing on his head he finds *absolutely* necessary during recess, or at least behind a door. . . . ."

We have omitted to make a note of the page on which this very necessary caution is to be found,—perhaps we dreamt it when dozing over the pages which are full of warnings quite as much uncalled for as this.

In the manual on Attention (which, by the way, contains much of the Mistaken Manual hashed up over again), our eye was

arrested by the heading "Be Magnetic." *Our* attention was at once caught, since we had not known that it was any part of a master's duty to emulate an electric eel, or a black cat stroked the wrong way on a frosty night. We were disappointed at finding that the recommendation merely was to understand the subject, to be earnest, and not to be listless, cold or formal. Let us seriously ask Mr. Hughes if he thinks any listless teacher would derive much benefit from being told this.

We are informed that much of the matter in these little works is to be found in similar manuals published in the States. Certainly we should be pleased to think that a Canadian Inspector of Schools is not chargeable with composing such rubbish, but it is questionable whether our national position is much bettered by the discovery that he considered the stuff worth appropriating,

"Convey, the wise it call,"

and issuing under his name. Probably the author regards himself in a dual capacity, like the famous Prince-Bishop in "Gengulphus," and while the *Inspector's* consequence may be a little lowered by this petty huckstering of empty books, the *individual* may feel a compensating weight in his breeches pocket that will console and help him to bear up against the remarks of what he, no doubt, considers a too-censorious world.

SCIENCE PRIMERS, *Introductory*, by Professor Huxley. New York: D. Appleton & Co.; *Physiology*, by Dr. Foster; *Astronomy*, by J. Norman Lockyer, F.R.S. Toronto: James Campbell & Son; *Geology*, by Professor Geikie. London: Macmillan & Co. Toronto: James Campbell & Son.

THIS series of Primers, some of which are mentioned above, is edited by Professors Huxley, Roscoe, and Balfour Stewart, and goes hand-in-hand with the kindred series of History and Literature Primers edited by Mr. Green and already noticed in our columns.

Taking them in the order we have given, we find Professor Huxley introducing the student to the general methods of science, and teaching the simple and fundamental rules that should guide us in observing nature. A careless inquirer might think that, in reserving this general field for himself, the Professor had selected an easy task, and that it must be far harder to discourse on Geology or the Planetary system than to describe such simple subjects as Sensations and Things, Properties and Powers. But a very little thought will teach us that the very simplicity of the subject demands a great deal in the way of clearness and precision of statement. It is possible for a pedant to put forth a great show of knowledge over the orbit of Jupiter or the Devonian rocks, and yet be far from grasping the meaning of what he teaches, but if a man sets to work to tell you the properties of a glassful of water there can be no disguising any latent incapacity. He must either fail altogether, or else his comprehension of his subject must be as crystal clear as the fresh drawn contents of the beaker itself. There is nothing harder than to be scientifically correct in things of every-day life.

Running shortly over Mr. Huxley's little book, we find it divided into three heads. First comes a short dissertation upon Nature and Science, the eleven subdivisions of which carry us over the preliminary ground, defining sensations and things, properties and powers. It explains what we really mean by speaking of a law of nature, not, for instance, that stones fall to the ground in consequence of the law of gravitation, but that the law of gravitation is a "way of asserting that which invariably happens when heavy bodies at the surface of the earth are free to move." [p. 13.] We are shewn the effect these laws, when ascertained, have on our practical conduct; and the means by which they are discovered, Observation, Experiment, and Reasoning are laid before us.

Part II. treats of material objects, and is divided into two heads, Inorganic or Mineral Bodies, and Living Bodies. Part III. only contains a very few lines on the subject of Immaterial Objects, upon which the Professor refers his readers to the special work on Psychology.

The following comparison of the growth of a wheat-plant and that of a crystal will serve to shew the manner in which organic and inorganic life is contrasted. After describing the corn-field, turning from its tender green blades to the full ear the Professor continues: "In so far as this is a process of growth, accompanied by the assumption of a definite form, it might be compared with the growth of a crystal of salt in brine; but on closer examination it turns out to be very different. For the crystal of salt grows by taking to itself the salt contained in the brine, which is added to its exterior; whereas the plant grows by addition to its interior; and there is not a trace of the characteristic compounds of the plant's body, albumen, gluten, starch, cellulose or fat, in the soil, or in the water, or in the air."

The illustrations and diagrams contained in Dr. Foster's *Physiology* are taken from the more elaborate and yet Elementary Lessons in Physiology by Prof. Huxley (published by Macmillan, 11th Edition, 1878) to which it avowedly serves as an introduction. Formed as it is upon this model we are not surprised to find it a clearly written and easily understood manual, besides being well qualified to excite an interest in the student and a desire to push his researches further.

Peculiar difficulties attend the man who attempts to make the science of Astronomy interesting within the bounds of a primer. Mr. Norman Lockyer has done his best in this little volume. Perhaps it would not be too much to say the best possible, but the difficulties remain insuperable. The simplest problems of Astronomy demand the same grasp of mind as is exacted by its more complicated questions. To understand the primary movements of the moon or our own earth the pupil must really master the meanings wrapped up in the terms axis, ecliptic, plane, equator, etc. Too many children never can conceive an axis otherwise than as a knitting needle stuck through an orange, and the machinery of lines and planes which appear in plates to indicate the orbits and revolutions of the planets gets firmly fixed in the youthful mind as an actually existing framework or scaffolding upon which the universe may be supposed to run. We do not wish to be understood as impeaching the method of teaching astronomy by means of these imaginary lines. They are, of course, essential to its due understanding, but we regret that from the nature of things so much stress has to be laid upon fictions, and that the labour of learning them should impose such a burden upon immature minds as to prevent the imagination from readily grasping the fact of their non-existence. The equator has a great deal to answer for, and has probably received as much implicit faith as any other myth that ever numbered up its thousands of blind believers. We have felt that an uneducated man would derive benefit from the perusal of almost any of these Primers, even if his studies stopped there. In this case, and unless he could push his reading further, we should think it best for him not to take up the subject at all, and in saying this, we need scarcely add that we do not attach any blame whatever to Mr. Lockyer.

Professor Geikie's *Geology* we can praise without reserve. *It goes to the right point* and remains there. All it seeks to do is to rouse an intelligent interest in the stones and earth beneath our feet, and to shew how rock and ravine speak to us with voices as loud as those with which the stones in the Arabian tale called after Prince Bahman when he climbed the enchanted hill in search of the talking bird, the singing tree and the golden water. The fancies of the East are indeed surpassed by that natural magic which has locked up the secrets of the far distant past in the hardened mud of by-gone ages, and preserved the record of a rain-shower on the sand, when granite palaces have mouldered to decay.

Mr. Geikie avoids all encumbrance in the shape of unnecessary nomenclature and terminology. You will search his pages in vain for the word "Palœozoic." He contrives to give a good idea of a fossil without lugging in the Pterodactyle. The only

division he attempts to make of rocks is the simple one of Sedimentary, as, for instance, sandstone; Organic, as chalk; and Igneous, as granite. In explaining the origin and formation of these three classes he finds abundant opportunity to catch the interest of the pupil, and his concluding division, entitled "The Crust of the Earth" serves admirably to explain how these different rocks have been tilted, crumpled, broken up and thrown into the strangest juxtapositions.

EDITORIAL NOTES.

THE MORAL COLLAPSE OF THE CENTRAL COMMITTEE.

In the light of the controversy which has been aroused, the words of a writer in our last issue in commenting upon the editorial articles which have been appearing in this Magazine, on the subject of the offences of the Central Committee, may be said to be significant, if not prophetic. Referring to the fatuous indifference of the Minister of Education to the "book scandal" we had for eighteen months past brought constantly before him, the writer spoke of the matter as "*a question on which Mr. Crooks will shortly find public opinion express itself more loudly than he expects.*" The speedy and emphatic realization of this prediction, we take it, not only fully justifies our denunciation of the Committee's misdoings, but also attests the enormity of the offence we persistently sought to expose, and which has at last brought upon the culprits the righteous wrath of an indignant public. Secure in their entrenched position, the Committee, no doubt, little troubled themselves with thought of the "pestilent fellow" who was the censor of their misdeeds—so long, at least, as the Minister continued indifferent to the charges made against some of their number, and while the moral sense of all was blunted by condemning such acts of the McLellan ring as were not connived at by its members. Fortunately, the iteration of our charges, and the means we took to bring them, through a non-professional magazine, to the public ear, have caused such a flutter in the dove-cots of Normal School square, and set each bird to peck at its fellow, that we are not likely to see the nest befouled again with inmates of so motley a breed, if it be not incontinently swept out of existence by the fiat of those who are now thoroughly alive to its character. Towards those of the Committee whose hands are clean, public commiseration and sympathy have doubtless rightly been extended. While ourselves sharing in this feeling, we must at the same time express surprise that those of its members whose sense of the malfeasance of Dr. McLellan and his confederates was at all acute, should have for such a period tacitly acquiesced in acts so damnatory to the reputation of honourable men, and made themselves, in a sense, accessories to the outrage. From Prof. Young's published letter it is gratifying to know that in the counsels of the committee room, Dr. McLellan's action did not at least go unrebuked, however much the fact of this protest, if it reached Mr. Crooks's ears, as we cannot but think that it did, tells against that gentleman, in his allowing innocent men to bear the odium of acts in which the vulgar greed of a few made them *participes criminis*, and from which the honourable instincts of the head of the Department should have been careful to have shielded them. What the Minister may now do to repair matters and regain public confidence for his administration must be a matter of serious concern to Mr. Crooks's friends and to all who have the weal of education at heart. Certain it is that those who make light of the gravity of the situation, and, with the partizan journal that has espoused the cause of the book ring, seek to blunt the ethical sense of the public by pooh-poohing the offence or impudently as-

serting that there is none, will do great disservice both to the Minister and to those incriminated. After what has come to light, only the sheerest impertinence can array itself in the guise of innocence, and with a cheap swagger and smug conceit call for the evidence of guilt. The public are now past trifling with in the matter, and of all men the Minister should by this time know what course it will be safe for him to take to allay the distractions of the controversy and to purge the Department of what has so long defiled it. However the Central Committee may be reconstructed, this assurance at least must now be given, that no one shall again be suffered to take the business of intellectual culture in hand to degrade it by illegally trading in the implements of education, and, in alliance with intriguing publishers, to use the office for the purposes of his pocket. It was bad enough that the teaching profession should have been made familiar with the arts of inspectoral intrigue, and be held in bondage to its arrogance and official thumb-screwing, but far more criminal has it been to familiarize youth with the ethical standards which our chief preceptors have raised in their sight and hearing, and to have shattered in their minds the fair ideal of what ought to be their models of all that makes for the gentleman and the man of honour. Unfortunately, the system upon which examinations are founded and the Government grant apportioned, is itself responsible for much that is unlovely in the mental and moral aspects of our youth while under school training; but he is a vile man who would further bedevil the system by making it the catchpenny to his greed, and at the same time entrap literature to trick itself out in the catchy conundrums which the senior Inspector, among others, has apparently deemed the legitimate exercise of an examiner's calling. With so vicious a system of school tests and the disastrous necessity of cramming and forcing, to enable the schools to hold their own in the successive educational race-heats, it is not to be wondered at that the arts of the empiric and the charlatan have flourished; but aware of the weak points of the system, it was to be expected that the Minister would be doubly vigilant—not only to prevent imposition and to remove incompetence but to take note of abuses which, with open temptation on all sides to create them, were sure to attach to the working of the varied and complicated machinery of his Department. That Mr. Crooks has not met reasonable public expectation in regard to these points of his administration, is, we say it sympathizingly, a matter of universal regret. We are confident, however, that his failure to satisfy that expectation has not been occasioned by want either of ability or of good intentions. The explanation is rather to be found, if we seek for it in personal shortcomings, in a nervous constitutional timidity and unreadiness, a manner uninviting and haughty, and an impolitic impatience with those who seek an interview with him on the public business of his office. But the prime source of failure, manifestly, is in the unfortunate choice he made some years ago of the members of his advisory body—not one-half of whom are men of the stamp to be entrusted with the responsible duties assigned to them. To abolish the Committee, as some have clamoured for, is of course not to be thought of; it has its useful and legitimate purposes, and may be made a real and satisfactory aid to the Minister. It might well, however, be reduced in number and its duties considerably curtailed. We have long thought that the Intermediate Examination, which was recently cut down to an annual, instead of a semi-annual test of school progress, might with advantage be conducted not on independent Departmental tests, but based, with some necessary adaptations, upon the University Matriculation or local examinations. This would greatly relieve and simplify the work now falling upon the Central Committee, and would be a vast saving of expense to the country, besides getting rid of a system the tendency of which is to encourage, in some sinister form or other, evils which have seemed inseparable from Departmental inspection and examination.

But Mr. Crooks's instant and most imperious want is of a small knot of cultured men

of high character and unimpeachable honour, from whom he can draw his advisory body, appoint as Inspectors, and, in rotation, select as examiners. As far as practicable, the Committee should represent the different departments of the teaching profession, but it is an imperative necessity that it should be composed of men who will command respect, not only for their qualifications but for their punctilious regard for fair and honourable dealing. There are two or three members of the present Committee, we may remark, who may safely form the nucleus of a re-organized body, but whether or not, there are surely, in connection with educational affairs in the Province, men of more than hammer and tongs qualifications, who possess the instincts of gentlemen, and may be trusted to conduct themselves as such—men whose scholarship and teaching attainments are marked by breadth and tone, and who, in their personal demeanour and contact with their fellows are untainted by Philistinism and innocent of the arts of the showman. Mr. Crooks's duty, at all events, is plain. The cry has gone forth, in tones that cannot be mistaken, that the people of the Province will have no more scandals in connection with the Department of Education. If the Minister wishes to escape the continued vivisection to which the Press, irrespective of party, has for the past two months subjected him, he will speedily address himself to the reorganization of his advisory body and put himself unmistakably on record as preferring the highest and most permanent interests of education to those which party connection and office-inheritance have calamitously fastened upon him. Thus will he, in the first place, restore an era of grateful journalistic peace, in regard to a most forbidding subject, and in the second, save his administration from becoming, unless the just outcry against it be appeased, "a by-word and a hissing in the land."

THE PRESS AND EDUCATIONAL MATTERS.

In the current criticism of the public journals, anent the unhappy subjects now up for discussion connected with educational administration, two gratifying facts have been made apparent, viz., the hearty interest our people take in educational affairs, and the sincere desire of the press to discuss matters appertaining thereto apart from politics. Canadian journalism has, in regard to the discussion, risen to the high water mark of ability and enterprise, and shewn in a marked degree how independent it can be of party trammels in the presence of a grave and important subject. The non-party press is of course no less to be commended for the line it has taken on the question; and the criticism of the *Bystander*, the *Canadian Monthly*, and the Toronto *Telegram*, has been both helpful and sound. The *Mail*, from the earliest outbreak of the discussion, has done good service, and is yet rendering it, with the admirable judgment, good taste, and intimate knowledge of facts which of late years has signally characterized its writing on this and kindred subjects. Outside of Toronto, both questions—that of the Central Committee and that of the University appointments—have received almost daily atttention from the press of the two parties, and have been discussed with intelligence and fairness, as well as with a spirit not only gratifying to Canadian manliness and self-respect, but satisfactory to every dispassionate and high-minded critic. Of the criticism of the press of other centres nothing could well be more outspoken, and at the same time courteous and just, than that which has appeared in the leading journals of Hamilton, London, and other towns in the Province. The *Times* of Hamilton, and the *Advertiser* and *Free Press* of London, have each dealt with the topic in a series of articles that would do credit to the journalism of any land, while the Stratford *Beacon*, the Guelph *Herald*, the London *Herald*, the Lindsay *Post*, the Galt *Reformer*, and the Norfolk *Reformer*, have manifested a like intelligent and laudable interest in the discussion. Other journals, which have not come under our notice, we understand, have also come forward with important utterances on the subject, and we are perhaps not wrong in saying that of the country press there are

scarcely half a dozen journals in the Province that have failed to take up the discussion and to demand that Mr. Crooks shall reconstruct the Central Committee and pursue a different policy with regard to the University appointments. The notable exception to this striking unanimity of feeling displayed by the press is, as our readers of course are aware, the Toronto *Globe*. But the fact is notable only on account of the solitary and perverse position taken by that journal. Nothing could be more fatuous than its defence of Mr. Crooks and the Central Committee, but its inconsequent and disingenuous writing, and the shifts to which it has had to resort, have only made it a public laughing stock and a butt for the satire of *Grip*, the clever and sprightly weekly whose watchfulness of the subjects up in the public mind is only equalled by its success in "shooting folly as it flies." On this as on other subjects handled by it, *Grip* has been most happy and effective. The attitude of the press on the present educational *imbroglio* is a healthy sign of independence and will do much to prevent educational affairs from again getting into a similar muddle—no matter to what party the Minister belongs.

GRIP'S EXAMINATION QUESTIONS.

In view of the approaching examinations *Grip* supplies his readers with the following invaluable specimens of model examination questions, which will be found to convey information not attainable from the authorized or unauthorized School Manuals.

HISTORY.

An ancient ballad has the following verse :

Last night the Queen had four MARIES—
To-night she will have but three—
There was MARY BEATON and MARY SEATON,
And MARY CARMICHAEL, and me.

Who was "me"? Who was the Queen? What was it all about?

The word "Tory" originally signified a "robber." Shew from the history of the N.P. the etymological propriety of this party name.

Name in consecutive order King Henry the Eighth's mothers-in-law.

BOTANY.

Explain how you would turn over a new leaf? State the family to which the root of all evil belongs.

Is a genealogical tree necessarily an exotic?

With what flower of a natural order is it best to play the game "He loves me, he loves me not"?

PHYSIOLOGY AND HYGIENE.

Describe the Comic Vein. Give a diagram of an ear for music. State how you would dissect a Limb of the Law. Explain the action and functions of a dead-head. Is the heart out of position when it is worn upon the sleeve? How would you stop the circulation of a slander? What is the best course to pursue when cut by a lady? How would you give unbiased treatment to a dress which had been badly gored? How would you improve the hearing of a door-post? How would you resuscitate the Queen's English after it had been murdered by School Inspectors?

MENSURATION.

Compute the blunders in McLellan's School Manuals. Estimate, if possible, the amount of money which the Ontario public have been forced to pay to book-peddling Inspectors. Define the *square* on which the Education Department should act, but does not. Calculate to what fraction Mr. Goldwin Smith can give his neighbours a piece of his mind, and yet retain a portion for his own use.

COMPARATIVE GEOGRAPHY.

Shew the difference between scholarship in Canada and Oxford. Other things being equal, which should have the preference for promotion in this country?

Give the location, chief products and most flourishing industries of *Centreville*, *Slab City* and *Smith Town*?

Account for the relative effects of the Twelfth of July and of the Seventeenth of March at Toronto and at Montreal.

MATHEMATICS.

Express as an *asymptote* the results of the N.P.

The *Globe* does not act on the *square*, shew the impossibility of squaring that circle.

Draw a tangent to the circumference of the crinoline now coming into fashion? Calculate the relative velocity of the clocks on two young ladies' stockings at a ball.—*Grip*.

UNIVERSITY OF TORONTO.

Candidates who Passed the Recent Matriculation Examination.

SCHOLARSHIP LOCAL EXAMINATION FOR WOMEN, ETC.

THE following is the list, in alphabetical order, of candidates who have passed the Matriculation Examination in the University of Toronto, with the schools and colleges at which they were trained :—

FACULTY OF ARTS.

Aikenhead, W., Clinton H. S.
Argo, J., Guelph H. S.
Bain, R., Upper Canada College.
Balderson, J. H., Perth H. S.
Baldwin, J. M., Upper Canada College and private tuition.
Bartlett, A. R., Windsor H. S.
Bell, A. W., Toronto Coll. Inst.
Boulton, A. St. G., Galt Coll. Inst.
Boville, T. C., Ottawa Coll. Inst.
Bowerman, J. P., Hamilton Coll. Inst.
Bowes, J. H., Upper Canada College.
Box, R., St. Mary's Coll. Inst.
Boyd, A. J., Upper Canada College.
Boyd, E. W., Upper Canada College.
Brent, C., St. Thomas Coll. Inst.
Brown, J. F., Upper Canada College.
Bruce, E. W., Brantford Coll. Inst.
Cameron, Emma, Canadian Literary Institute, Woodstock.
Campbell, D., Port Perry H. S.
Cane, G. F., Newmarket H. S.
Carlyle, J. C., Toronto C. I.
Cherry, G. A., Richmond Hill H. S.
Clark, J., St. Mary's Coll. Inst.
Clarke, J. W., Pickering College.
Coleman, A. H., Galt Coll. Inst.
Collins, J. A., Strathroy H. S.
Cowan, G. H., Brantford Coll. Inst. and private study.
Davidson, H., Goderich H. S.
Deacon, G. P., Bowmanville, H. S. and private study.
Doherty, A. E., private study.
Drake, F. A., Galt Coll. Inst., 20 mos.; private tuition, six months.
Fields, J. C., Hamilton Coll. Inst.
Findlay, C. S., Caledonia H. S.
Gardiner, Ella, Ingersoll H. S.
Gray, R. A., Toronto Coll. Inst.
Hambly, G. W., Hamilton Coll. Inst.
Hambly, Margaret E., Bowmanville H. S.
Harrison, S. A., Whitby H. S.
Helliwell, A. C., Upper Canada College.
Henderson, A., Oshawa H. S.
Henry, E. M., Oshawa H. S.
Hogg, Martha W., Oshawa H. S., 1 yr; Toronto Coll. Inst., 1 yr.
Holmes, G. W., Brantford Coll. Inst.
Howell, J. H., Welland H. S.
Johnston, J., Whitby H. S.
Kelly, H. T., St. Michael's College.
Kerr, W., Harriston H. S.
Lennox, Mary, St. Mary's Coll. Inst.
Leslie, R. J., Kincardine H. S.
LeVesconte, R. C., Campbellford H. S.
Lindsay, J., Brampton H. S.
Little, R. A., Hamilton Coll. Inst.
MacMechan, A. McK., Hamilton C. I.
Manson, A., Brantford Coll. Inst.
May, A. F., Ottawa Coll. Inst.
Milligan, W. G., Toronto Coll. Inst.
Mills, W. G., private study and private tuition.
Mosure, T. B. B., Whitby H. S.
Muir, J. M., Bowmanville H. S.
Mulvey, T., St. Michael's College.
McDonald, N., St. Thomas Coll. Inst.
McEwan, T., Caledonia H. S.
McGillivray, J., Goderich H. S. and private study.
McKenzie, A. F., Goderich H. S.
McKenzie, D., Galt Coll. Inst.
McKenzie, W. P., Upper Canada College.
McKillop, J. A., St. Thomas Coll. Inst.
McWhinney, J. M., Windsor H. S.
Neilson, J., Galt Coll. Inst.
Nichol, W. B., Toronto Coll. Inst.
Parker, S., Toronto Coll. Inst.
Palmer, J. M., Whitby H. S.
Peters, J. L., Hamilton Coll. Inst.
Phillips, W. A., Listowel H. S.
Playter, Margaret G., Uxbridge H. S.
Powell, F. C., Upper Canada College.
Powles, G. A., Lindsay H. S.
Pratt, W. L., Upper Canada College.
Sisley, E. A., Richmond Hill H. S.
Smellie, A. G. P., Toronto Coll. Inst.
Smith, L. I., Upper Canada College.
Smith, W. H., Caledonia H. S.
Smith, W. H., Toronto Collegiate Inst.
Stewart, Margaret, Hamilton Coll. Inst.
Teasdell, W. J., Richmond Hill H. S.
Thompson, J. E., Brantford Coll. Inst.
Thompson, W. E., St. Catharines C. I.
Tolmie, J. C., Toronto Collegiate Inst.
Welsh, Jessie B., Uxbridge H. S.
Waterhouse, E. F., Ingersoll H. S.
White, H. L., Hamilton Collegiate Inst.
Wigle, E. S., Galt Collegiate Institute.
Wright, W. V., Port Perry H. S., 1 year; Pickering College, 1 year.
Yates, G. F., Brantford Collegiate Inst.
Young, J. McG., Picton H. S.

NOTE—The cases of candidates Nos. 130, 138, 151, and 164 are held over for further consideration.

The schools and collegiate institutes are represented in the faculty of Arts as follows : Upper Canada College, 10; Toronto Collegiate Institute, 9; Hamilton, 8; Brantford and Galt, 6 each; Whitby, 4; St. Thomas,

Goderich, Bowmanville, St. Mary's, Caledonia, Richmond Hill and Oshawa, 3 each; Pickering, St Michael's College, Uxbridge, Ingersoll, Ottawa and Port Perry, 2 each.

FACULTY OF MEDICINE.

Carr, L., Hamilton Collegiate Institute.
King, T. C., Toronto Collegiate Institute.
Krick, C. A., St. Catharines Collegiate Institute.
Richardson, W. A., Upper Canada Coll.
Smith, R. S., Chatham H. S.
Thompson, A. S., Upper Canada College.

FACULTY OF ARTS.

Honour Lists.

CLASSICS.—Class I.—1, Nichol; 2, Hambly, G. W.; 3, Boville; 4, Little, R. A.; 5, Smith; 6, Bowes and Kelley. Class II.—1, Holmes; 2, Bain; 3, Helliwell: 4, McKenzie, W. P.; 5, Young, Milligan, and Powell; 8, Gray; 9, Mosure.

LATIN ONLY.—Class II.—Stewart.

MATHEMATICS.—Class I.—1, Fields; 2, Holmes; 3, Bruce; 4, Gray; 5, Smith, W. H.; 6, Balderson; 7, Lennox; 8, Wright; 9, Milligan; 10, Bartlett; 11, Muir; 12, McWhinny, Mulvey, and Palmer; 15, Aikenhead; 16, Thompson, W. E. Class II.—1, McKenzie, A. F.; 2, Boville; 3, Campbell; 4, Cameron; 5, Hambly, M.E., Brown, Leslie, Killop; 9, Le Vesconte; 10, Playter; 11, Nichol; 12, Harrison and Henderson; 14, White; 15, Young; 16, Teasdell; 17, Welsh, McKenzie, W. P., and Sisley; 20, Davidson.

ENGLISH.—Class I.—1, McMechan; 2, Boville; 3, Thompson; 4, Gardiner; 5, McKenzie, W. P.; 6, Bowes; 7, Brent and Hogg: 9, Johnson and Milligan. Class II.—1, McKenzie, A. F., McKillop and Stewart; 1, Gray and Mosure; 6, Smith, W. H.; 7, Holmes and Nichol; 9, Powles; 10, Helliwell, Henderson and Welsh; 13, Playter; 14, Hambly, M. E.; 15, Harrison and Henry; 17, Cowan, Lennox and Pratt; 29, McGillivray; 21, Drake; 22, Brown, Cherry, Muir and Neilson; 26, Palmer; 27, Boyd, A. J., and Wigle.

HISTORY AND GEOGRAPHY.—Class I.—1, Nichol; 2, Milligan; 3, Henry; 4, McKenzie, W.P.; 5, Bowes, Gray and McGillivray; 8, Thompson; 9, Powell; 10, McKillop and Palmer. Class II.—1, Brent; 2, Boville and Muir; 4, Davidson and Fields; 6, McMechan; 7, Gardiner; 8, Neilson; 9, Bell, Smith, W. H., and Thompson, T. E.; 12, Harrison; 13, Mosure; 14, Boyd, E.W., Holmes and Lennox.

FACULTY OF MEDICINE—*Honour List.*

CLASSICS.—Class I.—Krick. Class II.—Richardson.

MATHEMATICS.—Class I.—Krick.

ENGLISH.—Class II.—1, King; 2, Krick.

Scholarships.

CLASSICS.—W. B. Nichol (double).

MATHEMATICS.—J. C. Fields.

MODERN LANGUAGES.—J. H. Bowes.

GENERAL PROFICIENCY.—1, W. H. Smith (double); 2, T. C. Boville, Nichol; 3, R. A. Gray; 4, W. G. Milligan.

PRINCE OF WALES SCHOLARSHIP.—W. H. Smith.

LOCAL EXAMINATIONS FOR WOMEN.

The following candidates have passed in the groups opposite to their names. Group II. embraces the Mathematics, and Group III. the English, French, and History and Geography, of the Junior Matriculation examination:

Name.	*Trained at.*	*Group.*
Adams, M.	Ingersoll H. S.	II. III
Alport, A. B.	Brantford Y. L. C.	II. III
Armour, A	Dunnville H. S.	II.
Balmer, A. R.	Brantford Y. L. S.	II. III
Barr, A.	Ingersoll H. S.	II.
Barr, L.	Ingersoll H. S.	II. III
Brown, M.	Dunnville H. S.	II.
Cameron, H.	Brantford Y. L. C.	II.
Chambers, A.	Dunnville H. S.	II.
Crawford, E.	Ingersoll H. S.	II.
Crawford, S.	Ingersoll H. S.	II. III
Dale, M. A.	Thorold H. S	II. III
Flowers, M.	Dunnville H. S.	II.
Foster, M.	Ingersoll H. S.	II.
Fleming, L.	Brantford Y. L. C.	II.
Gunther, S. S.	Private tuition	III.
Haney, A.	Dunnville H. S.	II.
Harris, N	Ingersoll H. S.	II.
Hendrig, H.	Dunnville H. S.	II. III
Keele, S	Peterboro' C. I.	II. III
Knight, E	Can. Lit. Inst., Wdstck	III.
MacMurchy, H.	Toronto Col. Inst.	III.
Mylne, J.	Dunnville H. S.	III.
McKenzie, M.	Brantford Y. L. C.	III.
McLean, M.	Brantford Y. L. C.	III.
Parry, A.	Dunnville H. S.	II. III
Rogers, J.	Ingersoll H. S.	II.
Shaw, M.	" "	II. III
Sinclair, M.	" "	III.
Staunton, M.	" "	II.
Sutherland, A.	" "	II.
Stevenson, A.	Dunnville H. S.	II. II
Tainsh, E.	Brantford Y. L. C.	III.
Taylor, A.	Dunnville H. S.	III.
Taylor, J	" "	II.
Thomas, J.	Toronto Col. Inst.	III.
Wallace, N. V	Brantford Y. L. C.	III.

Honour List.

ENGLISH.—Class I.—1, Thomas, J.; 2, MacMurchy, H. Class II.—1, Gunther, S. S.; 2, Keele, S.; 3, McLean, M.; 4, Tainsh, E.; 5, Knight, E.

FRENCH.—Class I.—Thomas. Class II.—1, MacMurchy; 2, Gunther; 3, Alport, Balmer, McKenzie, Keele, Knight.

HISTORY AND GEOGRAPHY.—Class I.—1, MacMurchy; 2, Gunther. Class II.—1, Tainsh; 2, Alport, Thomas; 4, Knight; 5, McKenzie.

GERMAN.—Class I.—Gunther. Class II.—Knight.