

In case he should write again on this subject, I beg to propose the following questions:—

1st. Whether he did, or did not, investigate the law of coefficients previous to introducing his conclusion in reference to the law of expansion?

2nd. If not, whether any author of reputation can be cited as authority for such an omission?

3rd. If not this, then whether he can give any good and sufficient reason why he should introduce the practice? I readily admit that improvements in mathematical processes are now and then introduced, but those who introduce them must expect to have them challenged, and be prepared to give a reason.

In replying to my second objection, Professor Macleod quotes part of a sentence from my last letter, in which I had referred to the objection as made "on the score of too many assumptions," not supposing the phrase was likely to mislead any one who had read what I had previously written. On the authority of this phrase, however, he endeavors to convince himself that my objections had reference entirely to the number of assumptions. This point being gained he proceeds at once to the refutation. He first asserts his right to make two hundred assumptions, "provided that each of them held not only for the assumed values, but for the next greater integral value," and then declares that this proviso holds in the case of both his assumptions. *Ergo* the logic of his trigonometrical demonstration cannot be impeached.

All this seems fair; but in order to reach so happy a conclusion, it was necessary to use the same expansion in different and incompatible senses. The phrase, "provided that each of them held, etc.," to be true, must be understood to mean—provided that each of them can, by being combined with some *correct* equation, be shewn to have the same form for the next greater integral value. The same phrase, in order to help in patching up the professor's logic, would have to mean—provided that each of them can be made to have the same form for the next greater integral value by combining it with any other equation, true or false. This differs from that *toto coelo*. A mathematician has the right to make any number of assumptions that may suit his purpose, *provided the correctness of each of them is legitimately tested; but the combining of two hypothetical equations does not furnish a legitimate test*. I have previously pointed out the source of the error that would arise from combining one assumption with another, and need not now repeat the argument. In fact, the thing is so transparently wrong that argument seems scarcely necessary. To employ one hypothesis to prove the correctness of another, and then that other to prove the correctness of the first, is such sharp practice in the use of false logic that a mere statement of the case is sufficient to condemn it.

There seems some room for doubt, however, whether Professor Macleod is willing to allow that an assumption is hypothetical. He says he "was bound down in the form of his assumption by what was known to hold for particular numerical values," and he makes this statement in such a connection as to leave the impression that he regarded himself as having no liberty of choice. He must take that particular form or none. Now there is a sense in which his language, as above quoted, is true. Any man who makes a conjecture on any subject is, in a certain sense, bound down by the law that holds for particular cases, if he can find out what that law is. So the mathematician, if he can discover the law that holds for particular values, will, of course, make his assumption in accordance with that law. But it is not always easy to detect the law of expansion by considering a few numerical cases. It is, in fact, often impossible to do so; and mathematicians are frequently obliged to feel their way toward the true law by making assumptions which they suppose may be true, but which, when brought to the test, turn out to be false. A mathematician is not, therefore, in any proper sense, "bound down" to a particular form. If his assumption contains error, the progress of the argument is sure to disclose the fact, provided always the argument is properly conducted.

Yours truly,  
A. TEACHER.

#### GUYSBORO' COUNTY ACADEMY EXAMINATION.

MR. EDITOR.—The School term just closed has been one of general satisfaction and success. The Public Examinations of the various departments, which were held during the two last days of the term, reflected much credit both upon teachers and pupils, and were exhibitions of literary merit and improvement of the most gratifying character to all concerned. The entire Institution is a graded school, comprising the whole intermediate course, from the mere elementary, until it assumes the worthy dignity of a County Academy.

The Junior Elementary Department, taught by Miss Peart, has had 50 pupils in attendance during the term, with an average daily of 32. The perfect order and discipline manifest in this department, considering the age and number of children, were highly commendable, and the improvement in the various branches taught equally pleasing.

The Senior Elementary Department, taught by Miss Cahill,

has had 46 enrolled, and an average daily attendance of 33 during the term. Miss Cahill has been connected with the Institution for the last two years, and the present examination but goes to prove that her zeal and success have been unabated. The subjects in which the pupils were examined, were treated of in that prompt and intelligent manner, which evinced careful study on the part of the scholars, as well as unwearied drill on that of the teacher. Some of the Recitations and Dialogues were particularly well rendered. Miss Cahill, being about to resign her official position, which she has so faithfully filled, was presented with a complimentary address, signed by the Sheriff, the Ministers, and many of the principal persons of the town, expressive of their high appreciation of her virtues as a friend and a teacher. A similar address of affection and esteem was presented by the school, being wholly signed by her own pupils. Such expressions of regard are ever but the due of the faithful teacher, and cannot fail to afford encouragement, and inspire with true laudable zeal.

The Preparatory Department, under the very efficient management of Mr. Cox, has had in all 49 during the term, with an average daily attendance of 34. The pupils of this department, with scarcely an exception, acquitted themselves in a very creditable manner. The reading was generally excellent, and showed that a good amount of attention had been paid to this too much neglected, but important branch of education. English Analysis, Mental and Slate Arithmetic, were each treated of in a manner that shewed careful study and successful teaching. The Geography lesson was particularly interesting, being taught according to the natural and exhaustive divisions, as recently laid down by Mr. Calkin in his School Geography. The outlines of British History were scarcely less systematic in arrangement, or thoroughly understood and memorized. According to official inspection, this School is the only one in the County meriting a claim to the special grant for Superior Schools.

In the Academic Department, which is taught by Mr. McNaughton, B. A., there were 51 pupils in attendance, with an average daily of 32 during the term. At the March Examination for Teachers' License, 20 of these pupils applied for license of the several Grades from B to E, and it is believed with general success. Already numbers of teachers, which were greatly needed, have gone from the Institution to supply the surrounding School Sections. At the recent Public Examination, were very creditable specimens of Mapping and Drawing, tastefully arranged round the room by the amateur artists. There were also examination papers similarly arranged, having been carefully examined and corrected by the Head Master, on the following subjects, viz.:—Latin, French, Book-Keeping, Trigonometry, Navigation, Natural Philosophy, Chemistry, Geometry, History, &c., being in all nineteen different branches of study. The oral exercises in Reading, Prosody, British and Universal History, with Algebra, Geometry, and Mapping on blackboard from memory, were very satisfactory, and fully evinced the diligence and thought of the students, and are the best exponent of the teacher's efforts, ability, and success. Much of the rhetorical reading was especially good, perhaps with the exception, in some cases, of being too fast for the most accurate and distinct enunciation, and this is a prevalent defect.

The whole number of pupils in all the departments during the term was 196, and the average daily attendance was 132. Thus ends the semi-annual Public Examination, of one of the most pleasant and successful terms in the whole history of the present Institution. The entire examination was largely patronized by an intelligent and interested company of proprietors, visitors, and spectators; and at the close an apt eulogistic and retrospective address was offered by the Rev. George Johnson, who expressed his satisfaction with what he had witnessed of the order and proficiency of the School throughout, and contrasted the very favourable present educational position of Nova Scotia, with the years of the past. May Free Schools, and a liberal education, forever continue to bless our native land.

L. S. J.

#### DISCIPLINE.

Is order the *habit* of your school? Have you perfect *quietness* during writing? Do you *drill* your boys occasionally, with a view to securing habits of prompt obedience? Do you have the movements to and from the desks made in an orderly way? Do you sometimes have the movements made with perfect quietness, as a means of discipline? Are all the exercises conducted as *quietly* as is consistent with the full development of the powers of the children? Do you have all those subjects which depend for their improvement upon *practice*, such as reading, spelling, &c., taught *individually*? Is every exercise conducted *under observation*, that the pupils may feel that any inattention or disorder is certain of detection? *Have all the children at all times something to do, and a motive for doing it?* Do you abstain from giving a second command till the first has been obeyed? In stopping or directing the whole school, do you give your commands so loud as to be heard by all, and no louder? Are you *strict*, without being *severe*?