words is to be used and not to be parsed. I am fully persuaded trolled by laws as uniform in their operation as those which govern that by making grammar in this way more practical, keeping the word 'grammar" itself out of sight, and loaving the formal science of language to be taken up at a much later stage, we would be able to show better results.

IV. PHILOLOGY.

Much the rame line of remark applies to philology, including under this term the history and derivation of words. In school a great deal of time is often wasted by asking the pupil to commit to memory long lists of roots, prefix's, and affixes, and to practise what is called "word-building." This is a very unpractical and, therefore, indefensible way of teaching philology. The history and derivation of words should be dealt with in the lower class only in so far as they can be made useful in getting at their true meaning, and thus aiding in a more thorough comprehension of literary toxts. There should be no learning of Lits of roots, and the first introduction of the pupil to philology should be through the medium of analysis, not of synthesis-word-resolution, not word-building. Philology so treated can be made incidentally the means of affording an excellent training in generalization or induction. Let the teacher take a number of commonly recurring words, in which the root is constant and the prefix variable-as, for ex-ample, precede, recede, secede, proceed, intercede-and show how the force of the root of the word is constant while that of the prefix varies. Let him next take a number of common words in which the prefix is constant and the root variable-as, for instance, intercede, intervene, interchange, intermix-and show how the force of the prefix remains constant while that of the stem varies. By pursuing this method he will so a train his pupils to become intelhgent observers of verbal phenomena, to discover for themselves a number of philological laws, and—what is of more importance—to reason carefully and correctly on the inductive method. At the end of any given time they may know by heart fewer root-words and appendages ; but they will have a more intelligent knowledge of philology and be possessed of a method which is the instrument, the organon, of all progress in the so-called in luctive sciences. Do not think that I disparage the science of philology by asking to have it dealt with in this way. It happens that it is one of the sub-jects of which I am exceptionally fond, and I would not think of depriving your pupils of the pleasure to be derived from such a widening of their horizon as only philology can give. There is no reason why they should not gradually and proticably be made acquainted with the fact that each individual word has its history; that some of our words have been taken by great masters of literature for their own use from other languages ; that in this way the original stock of English words has been greatly and advantageously in-creased; that these English words have themselves greatly changed in both their original and inflectional forms; that Milton's and Shakespeare's Euglish, and even that of our common Bible, differs greatly in outward appearance fron, their texts as we now invari-ably see them printed; that still older texts differ still more, so that we get tack at last to a time when English must be learned anew like a foreign language, that this old English came originally to England from Western Europe, that it was brought over in many different forms called dialects, which still exist, chiefly as local patois, but in some cases also as the vehicle of dialectal literature ; that English is closely related in descent and form to several European languages, such as the Dutch, the German, the Scundinavian; that the members of this great Teutome family are more distantly related to another European group, which includes the French, the Spanish, the Italian, and the Portuguese; that these Romance languages, formed by the decay of the Latin, the Latin itself, the Greek and the Sanskrit of India, form with the Teutonic languoges a still larger group known as Indo-European or Indo-Gormanic; and that all these are comprised under the common name Aryan, to distinguish them from another large group called Semitic, which includes the Arabic, Hebrew, and Aramaic and from a third group described as Monosyllabic, of which Chinese is the most familiar example. The process by which all these relationships have been determined is strictly analogous to the process by which the past history of the earth's crust has been reconstructed by the geologists, and it constitutes one of the most perfect specimens of inductive reasoning afforded by the whole circle of the sciences. By treating philology in school as strictly subordinate and subservient to the obtaining of a clearer comprehension of the meaning of words, and by training the pupil gradually and incidentally to look upon apparently isolated and capricious etymological facts as parts of one great system of development, con-

the formation of the stratified rocks and the order of succession of animal life on the earth's surface, you will make the subject attractive instead of repulsive ; and it will remain with him, whether his knowledge of it be much or little, a matter of deep scientific interest through life, just as literature properly treated will remain a perennial source of systhetic and intellectual enjoyment.

Teachers' Examinations.

EDUCATION DEPARTMENT, ONTARIO, JULY EXAMINATIONS, 1885.

FIRST-CLASS TEACHERS-GRADE C.

ALGEBRA.

Examiner-J. A. McLellan, LL. D.

- 1. (a) Find the value of $5x^{3}+497x^{4}+200x^{3}+196x^{2}-218x-2001$ when x = -99. And of (b) $z^3+3x^2-13x-38$ for x=3.58443.
- Investigate Horner's Method of Division. Divide $(x^3+5x^4-17x^3-6x^2-10x+2) \approx 2x^3-3x+1$ And express $x^4+8x^3-16x-10$ in powers of x+2.
- 3. When is an expression
 - (1) Symmetrical with respect to two of its letters,
 - (2) Completely symmetrical with respect to two or more let-ters? Give examples. State clearly "the Principle of Symmetry."
 - Show that $(2x-y-z)^2(2y-z-x)^2+anal+anal$ is a perfect sauare.
- 4. If $f(x_i)^n$ be divided by x a the remainder is $f(a)^n$ (Prove). (1) Find the value of $6x^2 + 9x^3 16a^4 5a^3 12a^2 6a + 60$ when $3a^4 + a - 4 = 0$.
 - (2) Determine the values of p and q which will make $x^{12} 5x^{10} + 10x^3 15x^6 + 29x^4 px^2 + q$ vanish, if

 $(x^{2}-2)^{2}=x^{2}-3.$

5. Find the G. C. M. of $x^5 - 49x^2 + 116x - 68$ and $x^6 - 21x^2 + 20$. If 10 be put for x in these expressions and in their G.C.M. examine the resultant, and explain.

6. Find the factors of

- (1) $a^3+b^3+c^3-3abc$
 - (2) (a-b)(x-a)(x-b)+(b-c)(x-b)(x-c)+(c-a)(x-c)(x-n)(3) $(a+b+c)^5 (a^5+b^5+c^5)$. (4) prove that

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

$$\frac{xy+yz+zz=1.$$

A

- 7. (1) If $(x y)u^2 + (x + y)^2 a + (x^2 y^2)(x + y)$ be a complete square find the relation between x and y.
 - (2) Find the values of *u* which will make $x^2 + nax + a^2a$ factor of $x^4 ax^3 + a^2x^3 a^3x + a^4$.
- 8. Solve the equations :
 - $\sqrt{(2x^2+1)} + \sqrt{(2x^2+3)} = 2(1-x).$ (1)
 - (2)
 - $\frac{ax+b}{ax-b} \frac{bx}{ax+b} = \frac{ax}{ax-b} \frac{(ax^2-2b)b}{a^2x^2-b^2}$
 - x+y+z=3a+b+c(3)
 - x+y+t=a+3b+c
 - $\begin{array}{l} x-z-t=a+b-c\\ y+z-t=3a-b-c \end{array}$

9. A grocer had three casks of wine containing in all 344 gallons. He sells 50 gallons from the first cask; then pours into the first one third of what is in the second, and then into the second onefifth of what is in the third, after which the first contains 10 gallons more than the second, and the second 10 more than the third. How much wine did each cask contain at first ?

10. Given the sum of an Arithmetical Progression, the first term, and the common difference, find the number of terms (n).

- Interpret the result when there is a negative value of n.
- 11. (1) If n geometric means be found between p and q, determine their product. above that (2)

If x, y, z, are in G. F., show that

$$x^2y^2z^2\left(\frac{1}{x^3} + \frac{1}{y^3} + \frac{1}{z^3}\right) = x^3 + 3 + y^3$$