

3. Height of complementary seg=3, height of its trig. = $\frac{23^2}{2^2} - \frac{17^2}{2^2} = \frac{17}{2}$
 $\therefore$ its $(\frac{1}{2}$ chord) = $(\frac{23^2}{2^2} - \frac{17^2}{2^2}) = 60$, $\therefore$ chord = $4\sqrt{15}$.
- $\therefore$ chord of $\frac{1}{2}$ arc = $\sqrt{(60+9)} = \sqrt{69}$,
 length of arc = $\frac{1}{2}(8\sqrt{69} - 4\sqrt{15}) = \frac{1}{2}(2\sqrt{69} - \sqrt{15})$
 $= \frac{1}{2}(2 \times 8.306 - 4.872) = 16.986$,
 $\therefore$ area of sector = $\frac{1}{2} \times 16.986 \times 23 = 195.339$,
 area of its triangle = $3\sqrt{69} \times 3 = 8.306 \times 9 = 74.754$,
 $\therefore$ area of complementary seg = $195.339 - 74.754 = 120.585$,
 and area of seg. = area of circle - area of comp. seg.
 $= 23^2 \times .7854 - 120.585 = 415.4766 - 120.585 = 294.8916$.
4. Half chord = 168. Let h = height of seg. $\therefore$ (III. 35),
 $(625 - h)h = 168 \times 168$, i.e. $h^2 - 625h + 168^2 = 0$,
 $\therefore h = \frac{1}{2}(625 \pm \sqrt{625^2 - 4 \times 168^2}) = \frac{1}{2}(625 \pm \sqrt{461 \times 289})$,
 [for $(625)^2 - (2 \times 168)^2 = (625 + 336)(625 - 336)$]
 i.e. $h = \frac{1}{2}(625 \pm 31 \times 17) = \frac{1}{2}(625 \pm 527)$.
 Now the - sign does not apply, $\therefore h = 49$,
 $\therefore$ chord of $\frac{1}{2}$ arc = $\sqrt{(168^2 + 49^2)} = 175$,
 $\therefore$ length of arc = $\frac{1}{2}(8 \times 175 - 336) = 354\frac{2}{3}$ nearly.
5. Solidity = $33^2 \times 55 \times .5236 = 31361.022$.
6. The triangle is right angled, for $6^2 + 8^2 = 10^2$ $\therefore$ area = $3 \times 8 = 24$
 Side of equilateral triangle = 8, $\therefore$ area = $.433 \times 8^2 = 27.712$,
 difference = 3.712 .
7. Assuming cistern to be circular, it is two frustra of cones.
 $\therefore$ Area of bottom = $60^2 \times .7854 = 3600 \times .7854$,
 " mid. sec. = $50^2 \times .7854 = 2500 \times .7854$,
 " top = $65^2 \times .7854 = 4225 \times .7854$,
 Mean proportional between first two
 $= 50 \times 66 \times .7854 = 8000 \times .7854$,
 Mean proportional between second two
 $= 50 \times 65 \times .7854 = 3250 \times .7854$,
 $\therefore$ Solid'y low'r pt. = $(3600 + 2500 + 8000) \times .7854 \times \frac{2}{3}$,
 " upper " = $(4225 + 2500 + 3250) \times .7854 \times \frac{2}{3}$,
 " of cist'rn = $19075 \times .7854 \times \frac{2}{3}$, Imp. gal. = 277.274 c.in.
 $\therefore$ No. of gallons = $(19075 \times .2618 \times 20) \div 277.274 =$
8. 10 inches of upper part filled,
 $\therefore 10^3 : 20^3 =$ solidity of part : solidity of whole upper frustrum,
 $\therefore$ Solidity of part = $\frac{1}{8}$ that of upper frustrum,
 $= \frac{1}{8} \times 9975 \times .7854 \times \frac{2}{3} =$
 To which add solidity of lower part,
 $= 9100 \times .7854 \times \frac{2}{3}$,
 Content = $10346.875 \times .2618 \times 20$,
 Gallons = $10346.875 \times .2618 \times 20 \div 277.274 =$
 Bushels = " $\times$ " $\times$ " $\div 2150.4 =$

Correspondence.

SMITH'S FALLS, April, 1883.

To the Editor of the CANADA SCHOOL JOURNAL:

DEAR SIR, - Allow me to thank you for your most flattering notice in the April number of the JOURNAL, and to ask you to explain in the May number that, being under the impression that I could procure my release at a month's notice, I allowed my willingness to accept Strathroy head mastership to be known to my friends and the Board there; but finding, to my surprise, that my release could be procured by giving notice at the end of the year only, and that my Board were not willing to release me, although I had posted a suitable substitute in the working of my classes, I was obliged to resign the Strathroy appointment, with regret at causing any delay or disappointment in filling Mr. Embree's place. I regret that press of studies compelled me to neglect your request to furnish instances of errors in syntax, but I wish your success in your little venture in a much-needed reform: I am receiving the CANADA SCHOOL JOURNAL all right now, through the Lanark Teachers' Institute, although in some way the Secretary allowed my subscription to run out. I add, at Mr. McCreary's request, a criticism of your little Geography Primer, and hope it will be of service to you even yet. I have not the book myself, but you may send it in my order with Cato Major, German or English Literature for 1884, whenever, if ever, you publish them, and I will review them carefully.

Fraternally yours,

J. A. CLARKE, H.M.H.S.

Special Articles.

RELATION OF GRAMMAR AND LITERATURE.*

BY THE REV. DR. HUDSON.

(Concluded from last month.)

Not, however, but that something of special heed should be given to the Poet's language, and his use of words; for many of these are either unfamiliar or used in unfamiliar senses: but this part of the study should be kept strictly subordinate to the understanding of his thought and meaning, and should be pushed no further than is fairly needed to that end. But I have ample cause for saying, that in many cases, if not in most, altogether too much time and strength are spent in mere word-mongering and lingual dissection; a vice as old indeed as Cicero's time, who pointedly ridicules it in describing one as "a chanter of formulas, a bird-catcher of syllables." In fact, as we are now chiefly intent on educating people into talkers, not workers, so the drift of our whole education is, to make language an ultimate object of study, instead of using it as a medium for converse with things: for we all know, or ought to know, that the readiest and longest talkers are commonly those who have little or nothing to say. On every side, teachers are to be found attending very disproportionately, not to say exclusively, to questions of grammar, etymology, rhetoric, and the mere technicalities of speech; thus sticking for ever in the husk of language, instead of getting through into the kernel of matter and thought.

Now, as before implied, Shakespeare, least of all, ought to be taught or studied after this fashion. A constant dissecting of his words and syllables just chokes off all passage of his blood into the pupil's mind. Our supreme master in the knowledge of human nature, it is little less than downright sacrilege to be thus using him as the raw material of philological exertions. In the degree that it is important people should acquire a taste for him and learn to love him, just in that degree is it a sin to use him so; for such use can hardly fail to breed a distaste for him and an aversion to him. Doubtless there is a time for parsing, as there is for other things; but people cannot parse themselves or be parsed into a relish for Shakespeare's workmanship, or into a fruitful converse with his treasures of wisdom and power.

And with the young, especially, the study of vernacular authors should be prosecuted in entire subservience to the knowledge of things: if turned into a word-mongering process, it touches no free and natural springs of interest, and so becomes tedious and dull—just the thing to defeat all that pleasure which is the pulse of mental life. For the proper business, as also the healthy instinct of young minds, is to accumulate and lay in stores of matter: the analytic and discriminative processes naturally belong to a latter period; and to anticipate the proper time of them is a very bad mistake. But the knowledge of things proceeds too slowly and too silently for the ends of school-room show. Boys in school and college shine chiefly by the knowledge of words, for this is the mere work of memory; but, in practical life, men are useful and successful in proportion to their knowledge of things: which knowledge proceeds, to be sure, by the measures of *growth*, and therefore is far less available for competitive examinations and exhibitory purposes. And so, forsooth, our children must be continually drilled in a sort of microscopic verbalism, as if we had nothing so much at heart as to make them learned in words, ignorant of things. Hence, too, instead of learning how to *do* some one thing, or some few things, they must learn how to smatter of all things: instead, for example, of being taught to sing, they must be taught to prate scientifically about music.

* By permission of the Publishers, Ginn, Heath & Co., Boston.