ARITHMETIC.

(Continued.)

The next series of questions might be on reducing different denominations to some common lower denomination, and lower denominations to one higher denomination. 1st Example. Reduce 49 acres 28 p. 10 yds. 8 ft. and 112 inches to inches, and prove each step of every result.

a.	p.	y.	f.	in.
49	28	10	8	112

4
———
1962
40
———
7840 + 28
= 7868 poles.
$30\frac{1}{4}$
———
236040
1967 = ¼
———
238007 + 10
= 238017 yards.
9
———
2142153 + 8
= 2142161 feet.
144
———
8568644
8568644
2142161
———
308471184 + 112 = 308471296 inches.

Proof.

144)308471296
———
9)2142161 re. 112
———
$30\frac{1}{4}$ 230017 re. 8
4 4
———
121)952068
———
40)7868 re. 10
———
4)196 re. 28
———
49 re. 0 ∴

In. 308471296 = 49 a. 28 p. 10 y. 8 f. 112 in.

Otherwise, by reducing each denomination to inches, and multiplying it by the number of inches to which it is equal, thus—

6272640 = inches in 1 acre.
49 acres.
———
56453760
25090560
———
307359360 = inches in 49 acres.

39204 = inches in 1 pole.
28 poles.
———
313632
78408
———
1097712 = inches in 28 poles.

1296 = inches in 1 yard.
10
———
12960 = inches in 10 yards.

144 = inches in 1 foot.
8
———
1152 = inches in 8 feet.

Totals.

307359360 = inches in 49 acres.
1097712 = inches in 28 poles.
12960 = inches in 10 yards.
1152 = inches in 8 feet.
112 = inches
———
308471296 = inches in 49 acres. 28 pol. 10 yds. 8 ft. 112 in.

2nd. Example. Reduce 13829 yards 5288 poles and 722 roods to successive higher denominations: the highest acres—reducing them first to inches.

			a.	r.	p.	yds.
13829 × 1296 =	17922384	inches =	2	3	17	$4\frac{3}{4}$
5288 × 39204 =	207920752	" =	33	0	8	0
722 × 1568160 =	1132211520	" =	180	2	0	0
	1357444656	inches =	216	1	25	$4\frac{3}{4}$

The illustrations given of the three preceding Tables, with drill-questions, should be quite sufficient to make pupils understand the principles of reduction, and their various applications in processes and calculations. But to make them expert in applying them, they should be subjected to frequent review-drills. In our best schools, some subject, or part of a subject, is *daily under review.* Repetitions and reviews are indispensable in working everything taught into the scholar's mind. Without these, how little of teaching is retained! and of the little retained how lax is its hold on the memory! and how ill-prepared must the scholar be for examinatory drilling! Without these, how greatly is the teacher's labour increased, and small to the pupil must the amount of knowledge of any subject be! I strongly recommend to every teacher systematic reviewing.

Reviewing.

Every lesson has its parts; and these parts have their natural teaching-sequence. The teacher's duty is to consider well which of these should first be taken up—which should be his starting point; and that should be the one with which his pupils are most familiar. On it review till you are satisfied that their ideas on it are clear and correct. Consider, from the nature of the subject, which part should be next presented to them; and for reviewing on which, the *first would best prepare them.* Thus take up each part of the lesson, and each part of a part—passing on from what they *know* to what they know *less*—always taking care that the parts of the lesson have that arrangement which is most suited to the subject.

I have said that every subject has its parts, and sub-parts; and skilfully to teach each the most suitable sequence is supposed, by which the most elementary thing—the easiest for children to comprehend—that which admits of the plainest, the clearest, the most open to the mind, comes first, and first receives attention. And the clearer this elementary part is made to them, and the more it is worked into their understanding, and they, by repetitions and illustrations, master it, the better prepared are they successively to proceed from part to part. And this is much more than passing from the *known* to the *unknown.* It is advancing from the *clearly understood* part of a subject, to the *next well-brought-to-view succeeding part.*

No principle, no part of a subject can be clearly illustrated without bringing to view and partly unfolding the naturally succeeding principle or part. In arithmetic, especially in the fundamental rules, as many principles as possible should, in training, be combined, and in such a way as to make the one throw light on the other. All arithmetical principles have a depending connection which should be preserved in teaching. Adding involves the principle of subtracting, multiplying that of dividing; and the four should, with proper gradation, be taught together.

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