

BRIEF PAPERS.—No. ONE.—ON INTEREST.

Text.—“INTEREST is the sum of money paid for use or loan of some other sum of money.”

“INTEREST is divided into SIMPLE AND COMPOUND. When the interest is reckoned only on the principal or sum lent it is SIMPLE INTEREST.”—*Canadian Elementary Arithmetic*, p. 127.

Commentary.—The above statement is fallacious. There is but one kind of interest; there are not different species of allowances made for the use of money or that which can be valued in money. There are divers rules for computing the numerical value of the allowance. Of these, some give an imperfect result, but being of a simpler form, admit of convenient handling and speedy reference. Hence, they are frequently preferred in business (“time is money”) to more complex though strictly accurate formulae. This is more especially the case with such forms as approach so near to the truth as to exclude material error in their results.

The definition of simple interest above quoted further contains an implication that interest is something computed on money that is NOT lent. That cannot be, for interest is a function of the principal, rate, and time, that is $I = f(p, r, t)$, and the definition of principal declares it to be money LENT. You may say (what many do) that compound interest is “interest upon interest,” and thus try to mend one mistake by making another. It is impossible to logically construct any algorithm whereby interest shall be shown to be the function of interest or of any money not borrowed.

We are then forced to the conclusion that the terms *simple* and *compound*, as applied to interest, are MISNOMERS, and should consequently be expunged. Theoretical error leads to practical error, and the fallacies here refuted, though small, have in times past led to serious results, sometimes of most lamentable character.

The rules for computing interest may be divided into simple and complex. The term complex has a far different signification from compound. The complex rule is perfectly accurate, the simple rules are (all of them) approximations only, and, therefore, more or less inaccurate.

H. T. SCUDAMORE.

Sutherland's Corners, 17th Oct., 1872.

GENERAL RULE FOR EVOLUTION.

Divide the given number into two parts, such that the first part shall have an exact root. Unity would always suffice for the first part, since all its powers and roots are exact. But, for the sake of brevity, it is desirable that the first part be greater than the second, and the greater the excess the shorter will be the following process.

Then construct four columns of numbers in the following manner.

In the first column place the reciprocals of the series of natural numbers, commencing with unity, namely, $1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}$, &c. &c.

In the 2nd column place, as a first term, the index of the required root, (considered as a fractional power), and form the succeeding terms by successive additions of unity.

The terms in the 3rd column are all equal to one another, and are found by dividing the second part by the given number.

The first term of the 4th column is the root of the first part, and each succeeding term in this column is the continued product of the four terms of the next preceding horizontal line.

The sum of the fourth column is the required root.

EXAMPLES.

$\sqrt[5]{5} = \left\{ (\cdot 13) + \cdot 48024 \right\}^{\frac{1}{5}}$				$\sqrt[3]{9} = \cdot 729 + \cdot 171 \left\}^{\frac{1}{3}}$			
Col. 1.	Col. 2.	Col. 3.	Col. 4.	Col. 1.	Col. 2.	Col. 3.	Col. 4.
1	$\frac{1}{5}$	·086048	1·300 000 00	1	$\frac{1}{3}$	·19 900 000 00	
$\frac{1}{2}$	$\frac{1}{4}$	·086048	22 372 48	$\frac{1}{2}$	$\frac{1}{2}$	·19 57 000 00	
$\frac{1}{3}$	$\frac{1}{3}$	·086048	1 155 06	$\frac{1}{3}$	$\frac{2}{3}$	·19 7 220 00	
$\frac{1}{4}$	$\frac{1}{2}$	·086048	72 89	$\frac{1}{4}$	$\frac{3}{4}$	·19 1 059 95	
$\frac{1}{5}$	$\frac{3}{5}$	·086048	5 81	$\frac{1}{5}$	$\frac{4}{5}$	·19 167 83	
$\frac{1}{6}$	$\frac{2}{3}$	·086048		$\frac{1}{6}$	$\frac{5}{6}$	·19 27 64	
$\frac{1}{8}$	$\frac{5}{8}$	·086048		$\frac{1}{8}$	$\frac{7}{8}$	·19 4 67	
Total Col. 4. the root 1·323 606 66				Total Col. 4. the root ·96568049			

The product of the 1st line $1 \times \frac{1}{5}$
 $\times \cdot 086048 \times 1 \cdot 3$ forming 2nd term
 Col. 4, viz., $\cdot 022\ 372\ 48$ and $\frac{1}{5} \times 1 \cdot 3$
 $\times \cdot 086048 \times \cdot 022\ 372\ 48 = \cdot 001\ 155\ 06$, et cetera.

H. T. S.

Sutherland's Corners, 17th Oct., 1872.

Notwithstanding Mr. Scudamore's criticisms on the definitions of interest, as given in the text-books, we fail to discern any suggestion sufficient to either improve our knowledge of interest, or enable us to teach it with better success. Let any practical teacher try to make Mr. Scudamore's definition of interest more intelligible or useful than those given in the text-books. He says: “Interest is a function of the principal, rate, and time.” This, at least, has no claim to simplicity, the great charm in the art of teaching. Mr. S. declares the terms *simple* and *compound* to be misnomers, which should be expunged; but he has not given us words more suitable as substitutes. He says, “Theoretical error leads to practical error” This is exemplified in the late solutions headed “Interesting Interest,” by Mr. Cameron, whose fallacy has defied the logic and mathematical theory of Mr. Scudamore.

CHANGING TEACHERS.

To The Editor of the Journal of Education :

SIR,—This has remarkable in these parts for changing teachers. Situated in West Garafraxa, I cannot name one school having last year's teacher; nor are the villages an exception—Fergus, Mount Forest, Arthur, Alma and Douglas have all changed. I have had a letter lately from my Cousin, teacher, in the town of Killyleagh, County Down, Ireland. This man has managed to keep this school, or rather it has kept him, since, and before 1843, when I left him there. Since that year, I have been teaching in Canada, and I think the schools would outnumber, not only the years, but their halves. Were this a particular instance, the difference might be laid to the difference in the men. I wanted to write on the same theme as the Reverend William Cochrane, of Brantford, but, I refer your readers to the Journal for December, where they will find his article better than anything I could produce, and in my opinion, better than any other on the same subject.

The people have three reasons for changing teachers:—the first is, “that payment confers the right to employ, and the right to dismiss.” The popularity of this statement is owing to the palpable fairness on its surface; but it is fallacious, for, between the arbitrary right to dispose of money, and the judgment that should be employed in the disposal, there is no connexion at all.

2nd. “That the loss of this right would make teachers mere careless sinecures. Now suppose this right to employ and dismiss to be taken from the hands of trustees and placed in the hands of three well educated School Commissioners, one appointed by the Government, one by the people, and one by the teachers, would not the few competent trustees be relieved of an office both profitless and praiseless?”

If one function of these Commissioners were to nullify or certify the objections in a written petition signed by a majority of the ratepayers in a section wanting to remove its teacher, would this slow way of disposing of him make him more careless or more diligent? If he found himself secure against public caprice, and knew that he could not be removed but by a “fair trial” by competent judges, and if he were sure that nothing but established inefficiency or immorality could bias them against him, still he would endeavour to be popular; for, living a lifetime among a people wanting him away, is itself a consideration; and, let us remember, that one such removal do. Our present trustees form a petty “Star-Chamber” tribunal, exercising the same fatal certainty over position, that their prototype did over life, and against whose summary decisions remonstrance is futile. Many a clever man quits teaching altogether rather than succumb to the fiat of a crooked, boorish trustee. The 3rd, last, and worst argument of all is, “That popularity is the best test of worthiness or worthlessness.”

Public opinion is a public idol and has more devotees than any Eastern pantheon ever had. By public opinion, I understand public average intelligence—it must be the average, for public or general opinion is essentially not particular opinion. But what would be the probable opinion of a thousand men whom accident might convene? Would not the single opinion of one doctor, or one lawyer or one statesman be better in matters relating to his business, than the opinion of the thousand men outside the business? There is a positive absurdity in voting or passing judgment publicly on what one does not understand. The universality of the custom is apology, yet the apology is still worse than the custom—it is a futile attempt to establish this erroneous popular dogma.—What public opinion lacks in quality it can make up in quantity!

JOHN IRELAND,

Teacher.