

HAMILTON.—Lightning, 21st, 22nd. Lightning and thunder with rain. 15th. Wind storm, 15th. Rain, 2nd, 4th, 11th, 15th, 16th, 23rd, 25th. Meteor, 19th, 20th, 23rd, N. moving W.

SIMCOE.—Lightning and thunder with rain, 24th. Wind storm, 23rd. Rain, 16th, 18th, 19th, 24th, 25th, 26th, 29th, 30th. An agreeable month. Crops promise more than average, except potatoes injured by the bug, which is also now attacking tomatoes and other vegetables.

WINDSOR.—Lightning, 10th, 11th, 22nd, 26th, 27th. Lightning and thunder, 7th. Lightning and thunder with rain, 21st. Wind storm, 13th. Fog, 30th. Rain, 12th, 21st. Three meteors, 11th and ten on 12th. Meteor through Sq. of Pegasus towards H. and one towards S. on 14th. One through Z. towards S. W., 18th. One in S. E. towards H., 19th. One in S. towards W., and one in W. towards H., 23rd.

VIII. Mathematical Department.

To the Mathematical Editor of the Journal of Education.

Sir,—I notice by the June number of the *Journal*, which has just come to hand, that you wish to "shut down" on "Interest that is interesting." Before you do so, permit me, in justice to myself, to offer a parting remark on the criticisms so liberally bestowed on my humble article by yourself and others, many of which related, not to my subject, but consisted in attempts to show that my answer was not correct according to the principles of compound interest, a fact which I never denied, though to prevent so uncalled for a piece of trouble I italicized and used as plain Queen's English as I could command. Some of my critics, and notably Mr. Scudamore, in true keeping with the rigid niceties of the pedagogue, discard such time-honoured institutions as Simple Interest, and tax "poor me" with asking for the solution of impossibilities, with being old foggy enough to suppose, as men of sense generally do, that "it's a poor rule that won't work both ways," and with believing in such absurdities as simple interest annuities.

That the subject is beset with fallacies on every hand the complicated investigations of many an able actuary give ample testimony, yet, notwithstanding Mr. Scudamore's bewildering array of "constructions," "approximations" and "functions," I fail to see how any one can for a moment deny the existence of *Simple Interest*.

And certainly, the convenience with which we can reckon the interest of a given principal for a given time and rate, may warrant its continuance, for when we say that $I = Prt$, what do we mean but that R the amount of \$1 for a year compound interest $= \sqrt[4]{14 vt. 1 + rt}$. So that if I consider that a dollar should amount to R per annum, I may reckon either by compound interest from the formula $A = P R^t$, or determine r from the equation $R = \sqrt[4]{1 + rt}$, and say $A = Prt$ and A will be precisely the same in both cases. Whence then the fallacies? From nothing else but from supposing R and r to remain constant for varying values of t . Into such errors many of my critics have fallen, Mr. Glashan accepting my questions as extremely easy, and swallowing whole the absurdity "lurking" in the data, while others pronounced me wrong only to flounder through processes full of fallacies.

Now for the correct solution. Evidently $1000 = 160 (R^{-1} + R^{-2} + \&c. + R^{-10})$ where R from its very essence is constant; consequently the r of Mr. Howell's analogous formula is variable, though he supposes it constant, and, of course, gets the wrong answer. Let x be the equated rate from the variables P and r .

$$x = \frac{4}{25} \left(\frac{1-R^{-1}}{1} + \frac{1-R^{-2}}{2} + \&c. \right) + \frac{1-R^{-10}}{10}$$

whence $100x = 11.6436672$ + the required rate.

This, I think, settles the matter beyond cavil.

I remain,

Yours truly,

JOHN CAMERON.

Arnott, Ont., 14th Aug., 1873.

In giving Mr. Cameron the privilege of "firing the parting shot," the following remarks, from the celebrated Augustus De Morgan, may be interesting to our mathematical readers:—

"Some writers have defined the present value, estimated at simple interest, of an annuity to continue any number of years, to be that sum the amount of which would, in the given number of years, be equal to the amount of the annuity. But the sum thus obtained is not the present value of the annuity, but of the amount of the annuity after the given number of years. This amount is,

$$nA + n \times \frac{n-1}{2} \times rA, \text{ and } P_1 \text{ being the present value,}$$

$$P_1 \times (1 + nr) = nA + n \times \frac{n-1}{2} \times rA, \text{ or}$$

$$\frac{nA + n \times \frac{n-1}{2} \times rA}{1 + nr}$$

$P_1 =$ which differs from P the present

value of the annuity, as would be shown by substituting any number greater than unity for n in the values of P and P_1 . The meaning we give to the expression present value would naturally lead us to expect the two quantities P and P_1 to be equal. Their inequality is the strongest proof of the inadequacy of a mode of calculation, like that of simple interest, which, as it were, sets a mark upon any sums of money that may have accrued by way of interest, and forbids their future accumulation. The reason of their inequality is easily explained. Suppose p to be the present

value of \$ m due in one year. Then $p = \frac{m}{1+r}$, and let us suppose m to be unpaid for a second year and charged with interest; it amounts to $m(1+r)$. But p in two years amounts to $p(1+2r)$, or to $m \frac{(1+2r)}{1+r}$, which is different from the amount of m , and the reason is, because pr , the interest on p for the first year, is not charged with interest for the second year; and, therefore, in one case m was charged with interest, and in the other only p . Therefore p , which is the present value of m , is not the present value of the amount of m after any number of years."

$$\text{Finally, } P_1 = \frac{nA + n \times \frac{n-1}{2} \times rA}{1 + nr}; \text{ Put } n = 10, A = 160,$$

then we have, $28r = 6$ and $r = \frac{3}{14}$, multiply by 100 and $r = 21\frac{3}{7}\%$,

the result which has caused so much alarm. Mr. Cameron, then, is not the originator of the fallacy.

MATHEMATICAL EDITOR.

IX. Biographical Sketches.

1. THE RIGHT REV. BISHOP FARRELL.

His Lordship was born in the City of Armagh, Ireland, on the 2nd June, 1820, where he resided until, with his family, he emigrated thence to this Province, and settled in the City of Kingston, in the year 1830, where the family have ever since resided.

After pursuing his studies for some time at Kingston, he was sent by the late Bishop Macdonnell to the College of St. Sulpice, at Montreal, where he remained till he completed his classical course. From this institution he entered the Sulpician Seminary, under the direction of the same Order, and remained there till the completion of his theological course. During his whole career both at the College and the Seminary he evinced great talent, and was pointed out as one who would make his mark. He had a large head and large mind, as well as a large Irish heart, which endeared him to the professors and his fellow-students, as well as to all who had the privilege of his acquaintance in after life.

On leaving the Seminary he was ordained priest at Montreal, in May, 1846, and returned to his Bishop at Kingston, shortly after which, although young, his Bishop appointed him parish priest of L'Orignal. After remaining at that station for about two years he was recalled to Kingston, where he spent some seven years, two of which he was a Professor in Regopolis College. In this latter sphere he had an opportunity, which he did not lose, of showing not only his scholarship, but his great administrative ability, which marked him out for early promotion in his Church.

From Kingston his Bishop, as a further token of appreciation of his genius for organization and discipline, appointed him parish priest of the Town of Peterboro', where he remained, governing the parish and discharging, with zeal and untiring energy, the duties of his sacred calling, as the Catholics of Peterboro' will remember to this day; and which was beautifully and warmly expressed by them in a congratulatory address which they presented to him on his withdrawing from the pastoral charge of that place after being called to the See of Hamilton.

In the year 1856, the Roman Catholic Diocese of Toronto, being considered too large for the charge of one Bishop, was divided into three dioceses, that is, Toronto, Hamilton and London; and by the unanimous voice of the Prelates of the Roman Catholic Church in Canada, the Reverend John Farrell, Parish Priest of Peterboro', was declared to be fully worthy and competent to bear rule over one of the newly constituted dioceses. Accordingly his name, with that of the Right Rev. Dr. Pinsonneault, was sent to Rome for the approval of the Pope, and by virtue of "Letters Apostolic" of the Sovereign Pontiff the office of Bishop of the Diocese of Hamilton was conferred upon him, and he was consecrated in the Catholic Cathedral of Kingston, on the 11th May, 1856.

His Lordship arrived in Hamilton on the 24th of May of the same year, and was most cordially and affectionately welcomed to his