

SIMCOE.—Hail or sleet on nights of 8th and 30th. Windstorms, 4th, 13th, 15th, 19th—21st, 23rd, 25th, 30th, 31st. Fog 9th. Snow, 14th, 18th, 23rd, 25th, 30th. Rain, 9th, 10th, 30th, 31st. Much stormy weather and many ship-wrecks. On night of 30th very high wind East by North, attended by storms of snow, sleet and rain in succession. Telegraph poles thrown down. Intense cold on 2nd, 3rd, 4th, 5th, 6th, 20th.

WINDSOR.—On 17th, halcyon. Wind-storms, 8th, 9th, 18th—21st, 23rd, 30th, 31st. Snow, 3rd, 4th, 8th, 15th, 18th, 22nd, 23rd, 29th, 30th. Rain, 18th, 25th, 30th, 31st.

III. Correspondence with the "Journal."

INTEREST THAT IS INTERESTING.

To the Editor of the Journal of Education.

SIR,—Mr. McLellan's note on one of the problems in the recent examination papers induces me to make a few remarks on a similar one which I have since noticed, on page 203 of Sangster's Algebra. Inferring from the answer, the text-book reasons that as \$1 is due the last day, \$2 the preceding one and so on, the whole principal is equal \$1 for $(1+2+3 \dots 60)$ days, or \$1 for 1830 days. Interest on \$1 for one day = $\frac{1}{1830}$ and for 1830 days = $\frac{1830}{1830}$; this divided by number of payments gives $\frac{1}{1830}$. $\therefore$ daily payment = $1 + \frac{1}{1830} = \$1.00 \frac{1}{1830}$; or, in other words, it is assumed that \$1 plus interest on remaining debt is paid each day and that the sum of the payments divided by their number is the equal daily payment, = $\left\{ 2(1 \frac{1}{1830}) + (60-1) \times \frac{1}{1830} \right\} \frac{60}{2} \div 60 = \$1.00 \frac{1}{1830}$. This evidently is unfair to the payer as he loses interest by part of his payment being made in advance. The following seems a better solution. Let a = daily payment.

Then 1st day's interest = $\frac{1}{1830}(60)$
 2nd " " = $\frac{1}{1830}(60-a)$
 3rd " " = $\frac{1}{1830}(60-2a)$
 4th " " = $\frac{1}{1830}(60-3a)$ &c.

This being a series whose first term, common difference, and number of terms respectively are $\frac{1}{1830}$, $-\frac{a}{1830}$, and 60, we have

$$60a = 60 + \left\{ 2 \left(\frac{1}{1830} \right) + 59 \times -\frac{a}{1830} \right\} \frac{60}{2} \text{ whence } a = \$1.00 \frac{1}{1830}$$

Solving the \$5000 farm problem by the text-book principle, we get the annual payment = \$1437.50, while by the latter method above it is \$1422, 01 $\frac{1}{10}$, making, on the whole, a difference of very nearly \$62.

Taking compound interest which only is fair we reason thus. Let a = daily payment as before, and r = daily interest on \$1. Then first day's principal and interest = $60(1+r)$; deducting daily payment $60(1+r)-a$ is left; this at interest for the second day amounts to $\{ 60(1+r)-a \} (1+r)$

Similarly, third day's amount = $\{ \{ 60(1+r)-a \} (1+r)-a \} (1+r)$
 " fourth " $\{ \{ \{ 60(1+r)-a \} (1+r)-a \} (1+r)-a \} (1+r)$

Deducting a and removing brackets we find the principal at the end of the fourth day = $60(1+r)^4 - a(1+r)^3 - a(1+r)^2 - a(1+r) - a$

In like manner, we find, at the end of the n th day the remaining principal = $60(1+r)^n - a(1+r)^{n-1} - a(1+r)^{n-2} \dots a$
 $= 60(1+r)^n - a \{ (1+r)^{n-1} + (1+r)^{n-2} + (1+r)^{n-3} \dots 1 \}$

$= 60(1+r)^n - a \left\{ \frac{(1+r)^n - 1}{r} \right\}$ But when the debt is paid, the above expression = 0; therefore

$$60(1+r)^n = a \left\{ \frac{(1+r)^n - 1}{r} \right\}$$

whence $a = \frac{60r(1+r)^n}{(1+r)^n - 1}$ =, in the case before, to

$$60 \times \frac{1}{1830} \times \left(\frac{10001}{10000} \right)^{60} = \frac{\$01 \times 1 \cdot 010138}{010138}$$

$\left(\frac{10001}{10000} \right)^{60} - 1$
 Applying this to the examination question, we get $a = 5000 \times .06 \times 1 \cdot 06^4$

$$1 \cdot 06^4 - 1$$

The following somewhat similar question was discussed by the legal and commercial men of a town in Western Canada, but entirely

failing to agree they submitted it to the writer for his decision. It arose from a protested case in money-lending.

A lends B \$1000 payable in ten annual instalments of \$160 each. What rate per cent. *simple interest* does B pay for his money?

A majority thought his rate to be $10 \frac{1}{11}$ which is in accordance with the text-book principle, but from the following it will be seen that he paid the usurious per centage of $21 \frac{3}{7}$

$$\begin{aligned} \text{Interest for first year} &= 1000r. \\ \text{" for second "} &= (1000-160)r. \\ \text{" for third "} &= (1000-2 \times 160)r. \\ \text{" for fourth "} &= (1000-3 \times 160)r \text{ \&c.} \end{aligned}$$

From this series we get the total interest $\$600 = 2800r$ where r = yearly interest on one dollar. Hence rate per cent. = $600 \div 28 = 21 \frac{3}{7}$

I am pleased to note, for reasons too many to mention here, the prominence given to commercial arithmetic by the central committee of examiners.

I remain, Sir,

Your obedient servant,

JOHN CAMERON.

COLLEGIATE INSTITUTE,
 Cobourg, March 25th, 1872.

To the Editor of the Journal of Education.

SIR,—In reading Huxley's "Lay Sermons," I have been struck with his assertion that the Christian Clergy are either in general ignorance of the truths arrived at of late years by science, or that they know and fear to communicate to those under their teaching doctrines which they think incompatible with faith in the Christian revolution.

There is no harm in profiting by this opportunity to

"See ourselves as others see us,"

Nor can we be wrong in availing ourselves of a hint from a professed opponent of our Faith.

And there is too much truth in the assertion that the Clergy have not headed the present movement of thought in the direction of physical science. The present generation of University men have been too often imperfectly instructed in chemistry, biology and geology. They are ignorant, and on the principle of "*unum ignotum pro terribili*," they amathematise such theories as that of Darwin, and patch up pseudo-geological systems (like that of poor Hugh Miller) ignoring the fact that the opinion of all best qualified to judge on scientific questions is against them. It is the old Inquisition spirit. Men of science reply with this anathemic of "bigotry," they argue that because many ignorant or partially instructed christian teachers dread science, that therefore science is formidable to christianity! And as they have the public press on their side, and as the scientific anathema is considerably shriller than that of the clergy, the latter are very generally condemned as ignorant bigots, and the study of the laws of chemistry and of natural history is supposed to lead in some unexplained way to scepticism! Holding that spiritual revelation and scientific research more on entirely different plans and therefore can never by any possibility come in conflict. I desire to prove to the study of science among them committed to any spiritual care. Much that Mr. Huxley puts forward with regard to the practical as well as educational value of popularized scientific teaching, seems to me well worth the attention both of the christian teacher and of those engaged in promoting the cause of education in this country.

Admirable as is our Canadian School System, I find few of our young men engaged as Public School teachers have any knowledge of the laws of chemistry, of geology, or physiology, (I speak of them who have not been pupils at the Normal School.)

The object of this letter is to submit to government whether it might not be well to encourage competent persons to deliver a series of lectures on these subjects in local townships. Much might in this way be done to interest the young men in knowing somewhat of the world in which they live. Witness the "Manchester Science Lectures" and to my own knowledge those delivered in Dublin by the Professor of the Industrial Institute and of the Dublin Society.

It is with this object that I propose giving a series of lectures in the Township of Huntley, having no fear whatever that anything worth being called Christian Faith can ever be endangered by any possible discovery as to the work and laws of nature's God.

I am, sir, with much respect,

Yours,

CHARLES PELHAM MULVANY, M. A.,
 Incumbent of Huntley.