HIGH SCHOOL ATTENDANCE AND APPORTIONMENT FOR 1872.—*Continued.*

SCHOOLS.	Average First Half.	Apportioned at $9.75.	Added for Minimum.	Net Apportionment. First Half.	Average Second Half.	Apportioned at $8.	Added for Minimum.	Deducted as per note below. (*a*)	Net Apportionment. Second Half.
	$ cts.	$ cts.	$ cts.			$ cts.	$ cts	$ cts.	$ cts.
Toronto	111	1082 25		1082 25	129	1032 00			1032 00
Trenton	22	214 50		214 50	44	352 00			352 00
Uxbridge	22	214 50		214 50	23	184 00	1 50		*b* 185 50
Vankleekhill	16	156 00	44 00	200 00	22	176 00	24 00		200 00
Vienna	32	312 00		312 00	28	224 00			224 00
Walkerton	new school				20	160 00	40 00		200 00
Wardsville	28	273 00		273 00	24	192 00			*b* 192 00
Waterdown	25	243 75		243 75	24	192 00			*b* 192 00
Welland	40	390 00		390 00	38	304 00			304 00
Weston	32	312 00		312 00	25	200 00			200 00
Whitby	93	906 75		906 75	92	736 00			736 00
Williamstown	32	312 00		312 00	35	280 00			280 00
Windsor	19	185 25	14 75	200 00	48	384 00		14 75	369 25
Woodstock	42	409 50		409 50	36	288 00			288 00

NOTE.—The apportionment for the first half-year, distributed in July, was at the rate of $9 per pupil. Towards the close of the year, a balance remaining in consequence of certain projected new schools not having gone into operation, it was decided to distribute the money, which would otherwise have lapsed on 31st December, before the second half-year's returns had been received.

The balance was accordingly apportioned as follows:—

First,—A grant, at the rate of 75 cents per pupil (average attendance), in the first half-year of 1872, was made; and, secondly, those schools which did not thus obtain an apportionment of at least $200 (half of the legal minimum at the rate of $400), were allowed the difference, so that all should receive at least at the rate of $200 each for the half year. The balance was thus absorbed.

Some new schools being now about to go into operation, the rate per pupil, at least for the last half of 1872, had to be placed at $8, the grant being paid out of the vote of the current year. Should the attendance and the number of schools allow of a larger grant for the next half-year, an increased rate will be adopted.

a In the column for deductions are entered those amounts by which the grants on the basis of attendance for the second half-year were diminished, in consequence of the sums added to make up the $200 for the first half-year, together with the sum earned by attendance for the second half-year, exceeding the minimum at the rate of $400. No deduction is made where the attendance, without any added grant, has obtained a grant exceeding the rate of $400 for the year.

b Certain of the apportionments for the second half-year were less than $200, those for the first half being in excess; but in all cases the minimum at the rate of $400 for the year was granted to each of those schools.

VII. Mathematical Department.

(To the Editor of the Journal of Education.)

SIR,—I herewith send you for publication in the *Journal of Education* the solutions of the questions in Natural Philosophy and Algebra, proposed to candidates for First-class Certificates, at the recent examination of Public School Teachers.

It will be observed, that, instead of offering any solutions of my own of the questions in Natural Philosophy, I have transmitted, without alteration, the papers of Mr. Somerville, who has answered with substantial accuracy eight out of the nine questions proposed, and would undoubtedly have answered the remaining question also, had he not, in reading the question, inadvertently changed *cylinder* into *cone*. What he has written on this, the only problem which he did not succeed in solving, shows that he understood the principle involved; and, as the working of the problem happens to be extremely simple, he may be regarded as having virtually floored the paper. As Mr. Somerville was a pupil in the Normal School, I think it may fairly be inferred, from his admirable performance, that the instruction given in Natural Philosophy in the Normal School is of a very superior order.

The greatest number of marks, over the whole field, was obtained by a lady, Miss Anna Living. It is somewhat noteworthy that, in Algebra, among other subjects, she was decidedly ahead of all her competitors. You will find specimens of her work in the paper of solutions herewith transmitted. I send you also, for publication, specimens of her answers to the questions in History and English Literature. *They will show intending candidates for First-class certificates what sort of answers the examiners regard with satisfaction, and will, at the same time, convince intelligent persons throughout the Province that the examiners are faithfully observing the instructions they have received from the Council of Public Instruction, to place no candidates in the First-class who have not attained to a high degree of excellence.

I have the honour to be, Sir,
Your obedient servant,
GEORGE PAXTON YOUNG.

Toronto, 22nd Jan., 1873.

Mr. SOMERVILLE'S answers to the questions in Natural Philosophy:—

1st. Since the pressure of the air is equivalent to the weight of a column of mercury $2\frac{1}{2}$ feet high, it would balance a column of water $13{\cdot}57 \times 2\frac{1}{2} = 33{\cdot}925$ feet high.

But a cubic foot of water weighs 1000 oz. ∴ the pressure of the air is 33925 oz. on each square foot of surface.

Now, the surface of the sphere is $1^2 \times 3{\cdot}1416 = 3{\cdot}1416$ sq-feet. ∴ the pressure on it when in free external air would be $3{\cdot}1416 \times 33{,}925$ oz.

But the pressure of the air in the receiver is only $\frac{1}{3{\cdot}1416}$ that of the external air ∴ the pressure on the sphere is

$$\frac{3{\cdot}1416 \times 33{,}925}{3{\cdot}1416} = 33{,}925 \text{ oz.} \quad Ans.$$

2nd. Since No. 1 floats with $\frac{7}{10}$ of its volume immersed, its S. G. is $\frac{7}{11}$.

And since No. 2 floats in salt water with $\frac{26}{41}$ of its volume immersed, and that salt water is 1·025 times as heavy as fresh water ∴ its S. G. is

$$\frac{26}{41} \times \frac{1025}{1000} = {\cdot}65 \text{ or } \frac{13}{20}$$

Now, let x = weight of No. 1; then $x - 10$ = weight of No. 2.

And since the weight of a body, divided by its S. G., gives the volume, and the volume of each is the same ∴

$$\frac{10}{7}x = \frac{20}{13}(x - 10)$$
$$\text{or } 130x = 140x - 1400$$
$$\therefore\ 10x = 1400$$
$$\text{and } x = 140$$
$$\therefore\ x - 10 = 130. \quad Ans.$$

3rd. The C. G. of a sphere filled with water is in the centre, ∴ the pressure of the inner surface of a sphere is

$\pi d^2 \times \frac{1}{2}d \times$ weight of one cubic foot of water, because, to find the pressure, we multiply the area of the surface pressed (πd^2) by the depth of the C. G. below the upper surface, and that by the weight of a cubic foot of water. And the weight of the water is $\frac{\pi d^3}{6} \times$ weight of 1 cubic foot of water; but the pressure on the inner surface of the sphere is $\frac{1}{2}\pi d^3 \times$ weight of a cubic foot of water, ∴ the pressure on the inner surface is equal to three times the weight of the water.

4th. A uniformly accelerating force is measured by considering how much the velocity is increased in one unit of time.

When a body is moving with a velocity which is not uniform, its velocity at any instant is measured by considering how far it would

* Deferred for want of space until next month.—ED. *Journal of Education.*