CARAMONA
STREETE
CO. WESTMEATH

15/15

11th Jan.y 1897.

Φ,

No stars!!!

We have been trying to mend a Sprengel Pump to make a Crookes vacuum; but beyond a certain point of exhaustion we cannot get; the joints are faulty somewhere.

Wilson is going to send an Abstract of the last paper on your exp.ts with nitrogen, oxygen, hydrogen, &c., & the arc to Nature. This abstract accompanies this letter, in order that you may consider a doubt which occurs to me about your calculation of the state of affairs for Carbon vapour in

If you are right, you should send the abstract to Nature at once. If not, you must modify. Perhaps s is only a small integer, & then your result would be fairly true.

I dont know what to do – whether to move, or to pack up, or both. One good night would be worth waiting for 'till Wednesday night. I'm in a regular fix.

contact with liquid (or solid) Carbon.

I presume that in your equation Δv means $v_2 - v_1$, where v_2 = volume of 1 gram of vapour & v_1 = vol. of 1 gram of liquid (or solid). You make $\Delta v = 10^4$ about. [Your "q.p." is very awkward & misleading in appearance.]

Now if I am right in supposing that Δv is as above, we may say that Δv is simply v_2 ∵ v_1 is very small.

But unless we know the specific gravity of Carbon vapour with respect to air we cant find Δv; and I think that

$$\Delta v = \frac{10^4}{s}, \text{ \& not } = 10^4,$$

where s = sp. gr. of Carbon vapour.

Thus from the = ⁿ:

$$W(\text{grams}) = .4645 \frac{v^{\text{litres}} \times p^{\text{mm}} \cdot s}{T}$$

we have, if pressure = 1 atmosphere,

$$1 = .4645 \frac{v \times 760}{3800} \cdot s$$

$$10/15 = \frac{.4645\, v \times s \times 2}{10} = \frac{vs}{10} \text{ (about)}$$

$$\therefore v(\text{litres}) = \frac{10}{s}$$

$$\therefore v(\text{cub. cms}) = \frac{10^4}{s}.$$

It looks as if you had overlooked $\underline{s}$; but I may be wrong.

Now if I am right & s is unknown, your result will be

$$\frac{\delta T}{T} = \frac{10^{10}}{s.\lambda},$$

and a great deal may depend on s. If s = 10, your δT instead of being 220 will be 22; & if s = 100, δT = 2.2, so that your conclusions would not be correct. However, I may not correctly understand your thermodynamic equation, & perhaps you are right after all.