[142r]

Ashley-Combe
Sunday. 21st Novr ['1841' inserted by later reader]

Mr Dear Mr De Morgan. [something crossed out]
I said Weddy. At least I meant to do so. On Tuesday I have already an engagement in the morning. Perhaps you have written Tuesday by mistake. But of you cannot come on Weddy, then I must put off my Tuesday's engagement, that I may see you then. If it is the same to you however, I should much prefer Weddy.

Can you kindly give me one line tomorrow to say which it is to be. I shall get ['it' inserted] in the evening in St James' Sqre. _ Now I proceed to business :
1stly: You have mistaken my intentions I think about the formulae of pages 155, 156. My enclosures 1 & 2 will explain. __
2ndly. Enclosure 3 contains the demonstration of "Exercise" page 159
3dly. Enclosure 4 . . . . "Exercise" page 158
4thly: About the Constant in page 141 : I still am [142v] unsatisfied. I perfectly understand that "any value" consists with everything in page 141. The principle is I conceive exactly the same as that by which in page 149, y is made $= a + \sin .x$ instead of $y = \sin x$.

I only mean that this result seems inconsistent with page 116 when it is shown that the Constant must $= \frac{w}{2}$. _
5thly: page 161, (line 14 from the top):

$$\varphi''(x+\theta h, y+k) - \varphi''(x+\theta h, y) = \varphi_1^{('')}(x+\theta h, y+vk).k \qquad v<1$$

Why is v introduced at all? __
I have as follows :

$$\frac{\varphi''(x+\theta h, y+k) - \varphi''(x+\theta h, y)}{k} = \varphi_1^{('')}(x+\theta h, y)$$

if k diminishes without limit ; (k being $= \Delta y$)

or $\varphi''(x+\theta h, y+k) - \varphi''(x+\theta h, y) = \varphi_1^{('')}(x+\theta h, y)k$

But I do not see how v comes in. __
6thly : I have several remarks to make altogether on the Article Operation. I will only now subjoin two. I believe on the whole that I understand the

Article very well.
See page 443, at the top, (2nd Column) :

$$\varphi^2 + 2\varphi\psi + \psi^2, \text{ or } (x^2)^2 + 2(x^3)^2 + (x^3)^3$$

should be it appears to me $\varphi^2 + 2\varphi\psi + \psi^2$, or $(x^2)^2 + 2x^3.x^3 + (x^3)^2$

$$\text{or } (x^2)^2 + 2(x^3)^2 + (x^3)^2$$
$$= (x^2)^2 + 3(x^3)^2$$

[143r] I only allude to $(x^3)^3$, instead of $(x^3)^2$ as I make it.
See page 444, at the bottom, (2nd column) :
"Where B_0, B_1, &c are the values of fy and its
"successive diff-co's [*sic*] when $y = 0$, &c, &c"
Surely it should be when $y = 1$.
The same as when immediately afterwards, (see page
445, 1st column, at the top), in developping [*sic*] $(2 + \Delta)^{-1}\varphi x$;
B_0, B_1 &c are the values of fy & its Co-efficients
when $y = 2$, &c, &c. ____

I have referred to Numbers of Bernoulli
& to Differences of Nothing ; in consequence of
reading this Article Operation. And find that
I must read that on Series also. __

I left off at page 165 of the Calculus ; &
suppose that I may now resume it ; (when I return
here that is). __

I will not trouble you further in this letter.
But I have a formidable list of small matters
down, against I see you. __

Yours most sincerely

A. A. Lovelace