As we are informed, that there are two vulcanoes opened, I am in great hopes theſe will prove a ſufficient vent to diſcharge all the remaining ſulphurous matter in the bowels of theſe countries, and put a ſtop to any further earthquakes here; at leaſt for many years to come.

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## XLIII. *A Letter from the late Reverend Mr.* Thomas Bayes, *F. R. S. to* John Canton, *M. A. and F. R. S.*

SIR,

Read Nov. 24, 1763.

IF the following obſervations do not ſeem to you to be too minute, I ſhould eſteem it as a favour, if you would pleaſe to communicate them to the Royal Society.

It has been aſſerted by ſome eminent mathematicians, that the ſum of the logarithms of the numbers 1.2.3.4. &c. to $z$, is equal to $\frac{1}{2}$ log. $c + \overline{z+\frac{1}{2}} \times$ log. $z$ leſſened by the ſeries $z - \frac{1}{12z} + \frac{1}{360z^3} - \frac{1}{1260z^5} + \frac{1}{1680z^7} - \frac{1}{1188z^9} +$ &c. if $c$ denote the circumference of a circle whoſe radius is unity. And it is true that this expreſſion will very nearly approach to the value of that ſum when $z$ is large, and you take in only a proper number of the firſt terms of the foregoing ſeries: but the whole ſeries can never properly ex-

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preſs any quantity at all; becauſe after the 5th term the coefficients begin to increaſe, and they afterwards increaſe at a greater rate than what can be compenſated by the increaſe of the powers of $z$, though $z$ repreſent a number ever ſo large; as will be evident by conſidering the following manner in which the coefficients of that ſeries may be formed. Take $a = \frac{1}{12}$, $5b = a^2$, $7c = 2ba$, $9d = 2ca + b^2$, $11e = 2da + 2cb$, $13f = 2ea + 2db + c^2$, $15g = 2fa + 2eb + 2dc$, and ſo on; then take $A = a$, $B = 2b$, $C = 2 \times 3 \times 4c$, $D = 2 \times 3 \times 4 \times 5 \times 6d$, $E = 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8e$ and ſo on, and A, B, C, D, E, F, &c. will be the coefficients of the foregoing ſeries: from whence it eaſily follows, that if any term in the ſeries after the 3 firſt be called $y$, and its diſtance from the firſt term $n$, the next term immediately following will be greater than $\frac{n \times \overline{2n-1}}{6n+9} \times \frac{y}{z^2}$. Wherefore at length the ſubſequent terms of this ſeries are greater than the preceding ones, and increaſe in infinitum, and therefore the whole ſeries can have no ultimate value whatſoever.

Much leſs can that ſeries have any ultimate value, which is deduced from it by taking $z = 1$, and is ſuppoſed to be equal to the logarithm of the ſquare root of the periphery of a circle whoſe radius is unity; and what is ſaid concerning the foregoing ſeries is true, and appears to be ſo, much in the ſame manner, concerning the ſeries for finding out the ſum of the logarithms of the odd numbers 3. 5. 7. &c.... $z$, and thoſe that are given for finding out the ſum of the infinite progreſſions, in which the ſeveral terms have the ſame numerator whilſt their denominators

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are any certain power of numbers increasing in arithmetical proportion. But it is needless particularly to insist upon these, because one instance is sufficient to shew that those methods are not to be depended upon, from which a conclusion follows that is not exact.

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## XLIV. *An Account of the Insect called the* Vegetable Fly: *by* William Watson, *M. D. F. R. S.*

To the Royal Society.

Gentlemen,

Read Nov. 24, 1763.

THE beginning of last month, I received a letter from our learned and ingenious member Dr. Huxham of Plymouth; in which among other things he informed me, that he lately had, by permission of commissioner Rogers, obtained a sight of what is called the *vegetable fly*, with the following description of it; both which he had from Mr. Newman, an officer of general Duroure's regiment, who came from the island *Dominica*. As this description seemed to the doctor exceedingly curious, he has sent it me, exactly transcribed from Mr. Newman's account, and is as follows.

" The *vegetable fly* is found in the island Dominica, " and (excepting that it has no wings) resembles the " drone both in size and colour more than any other " English insect. In the month of May it buries itself " in