Nombres, 3rd edition, vol. ii. p. 438.) But he has overlooked the existence of the equation of condition (ξ), without which, essentially linked as it is with the irreducibility of the proposed equation, such a system of successive equations could not exist. It appears that Legendre was not himself aware that there was any antagonism between the results at which he had arrived and those of Abel. If, however, the non-existence of the condition (ξ) could without error be assumed, the objection of the learned author of the treatise on the Calculus of Functions in the *Encyclopædia Metropolitana* (p. 382) would undoubtedly be applicable to Abel's method.

Long Stratton, Norfolk,
April 14, 1852.

[To be continued.]

LXV. *Observations on a New Theory of Multiplicity.* *By* J. J. SYLVESTER, *Barrister-at-Law*.*

IN the Postscript to my paper in the last Number of the Magazine, I mis-stated, or to speak more correctly, I understated the law of Evection applicable to functions having any given amount of distributive multiplicity. The law may be stated more perfectly, and at the same time more concisely, as follows. Every point represented by the coordinates $\alpha_1, \beta_1, \ldots \gamma_1$, for which the multiplicity is m_1, will give rise in *every evectant*† of the discriminant of the function to a factor $(\alpha_1 x+\beta_1 . y+\ldots\gamma_1 z)^{m_1 . n}$, ($n$) being supposed to be the degree of the function. Hence if there be r such points, for which the several multiplicities are $m_1, m_2, \ldots m_r$, every evectant must contain $(m_1+m_2+\ldots+m_r).n$ linear factors; and as the ιth evectant is of the degree $\iota.n$, it follows that all the evectants below the $(m_1+m_2+\ldots+m_r)$th evectant must vanish completely, and this Evectant itself be con-

* Communicated by the Author.

† Frequent use being made in what follows of the word Evectant, I repeat that the evectant of any expression connected with the coefficients of a given function (supposed to be expressed in the more usual manner with letters for the coefficients affected with the proper binomial or polynomial numerical multipliers) means the result of operating upon such expressions with a symbol formed from the given function by suppressing all the binomial or polynomial numerical parts of the coefficients to be suppressed, and writing in place of the literal parts of the coefficients a, b, c, &c. the symbols of differentiation $\frac{d}{da}, \frac{d}{db}, \frac{d}{dc}$, &c.; in all that follows it is the successive evectants of the discriminant alone which come under consideration. I need hardly repeat, that the discriminant of a function is the result of the process of elimination (clear from extraneous factors) performed between the partial differential quotients of the function in respect to the several variables which it contains, or to speak more accurately, is the characteristic of their coevanescibility.