481.

ON THE EXPRESSION OF M. DELAUNAY'S $h+g$ IN TERMS OF HIS FINALLY ADOPTED CONSTANTS.

[From the *Monthly Notices of the Royal Astronomical Society*, vol. XXXII. (1871—72), p. 74.]

I HAD the pleasure of receiving from M. Delaunay a letter dated Paris, 17th Dec. 1871, in which he informs me that, on referring to his papers, he had found there expressions for l, g, h, identical with those given by me in the November Number of the *Monthly Notices*,—with only a single typographical error, $\frac{23}{33}e'^2m^3$ instead of $\frac{23}{32}e'^2m^3$ [*ante* p. 532, corrected] in my expression of h.

M. Delaunay mentions also that he had obtained four additional terms in the expression for $h+g$ (longitude of the Moon's perigee), and that the complete expression in terms of the finally adopted constants is

$$
\begin{aligned}
h+g= \\
nt\Big\{ & \left(\tfrac{3}{4} - 6\gamma^2 - \tfrac{3}{8}e^2 + \tfrac{9}{8}e'^2 - \tfrac{45}{4}\gamma^4 + \tfrac{69}{8}\gamma^2e^2 - 9\gamma^2e'^2 - \tfrac{3}{32}e^4 - \tfrac{9}{16}e^2e'^2 + \tfrac{45}{32}e'^4\right)m^2 \\
& + \left(\tfrac{225}{32} - \tfrac{189}{8}\gamma^2 - \tfrac{675}{64}e^2 + \tfrac{825}{32}e'^2 + \tfrac{1107}{16}\gamma^4 + \tfrac{81}{32}\gamma^2e^2 - \tfrac{349}{4}\gamma^2e'^2 - \tfrac{2475}{64}e^2e'^2\right)m^3 \\
& + \left(\tfrac{4071}{128} - \tfrac{3963}{32}\gamma^2 - \tfrac{31605}{512}e^2 + \tfrac{61179}{256}e'^2\right)m^4 \\
& + \left(\tfrac{265493}{2048} - \tfrac{335403}{512}\gamma^2 - \tfrac{1483665}{4096}e^2 + \tfrac{1767849}{1024}e'^2\right)m^5 \\
& + \left(\tfrac{12822631}{24576} - \tfrac{25291729}{16384}e^2\right)m^6 \\
& + \left(\tfrac{1273925965}{589824} + \tfrac{352038855}{1179648}e^2\right)m^7 \\
& + \tfrac{71028685589}{7077888}m^8 \\
& + \tfrac{32145914707741}{679477248}m^9 \\
& + \left[\tfrac{45}{32}m^2 + \tfrac{7425}{512}m^3\right]\frac{a^2}{a'^2}\Big\}.
\end{aligned}
$$

[Observe that $h+g$ is $=nt-l$, and compare with the expression for l, *ante* p. 532.]