

Notice of Traces of Eruptive Action in the Moon.

By the Rev. T. W. Webb.

The inquiry as to the continuance of volcanic or explosive action on the surface of the moon must be admitted to be a very interesting one. Astronomers are generally agreed as to its entire cessation on any conspicuous scale; but this would not necessarily infer the impossibility, or even improbability, of minor eruptions, which might still continue to result from a diminished but not wholly extinguished force. Till the publication of the labours of Beer and Mädler the necessary data for the determination of the question were very imperfect; and since that time the general impression would seem to be adverse to the idea of any physical change. Before, however, it is entirely acquiesced in, it may be well to see whether any evidence of an opposite nature exists. Want of leisure has hitherto prevented me from entering upon the subject in any other than the most incidental manner; but I would request permission to direct attention to one or two regions where an accurate investigation might be desirable.

Webb p. 27.

One of these is the spot named *Cichus*, near the south extremity of the *Mare Nubium*. Here, many years ago, in comparing Schröter's drawings with the moon, I was struck with the apparent enlargement of the small crater which has defaced one side of the ring. On procuring the map of Beer and Mädler I found that they had also seen it enlarged. Could we, in this instance, depend upon the older drawings, we might reasonably infer the probability of a change since the year 1792. Schröter was, undoubtedly, a coarse draftsman, but still he was faithful and careful; nor does there seem any appearance, but the reverse, that his designs were copied from one another to save trouble; if not, the agreement of three separate figures seems fair evidence that this little crater was not then of its present magnitude.

The second case seems more satisfactory. It is that of the spot *Messier*, in the *Mare Fecunditatis*, where two small craters lie side by side at the end of two parallel white streaks, resembling the divided tail of a comet. In consequence of an observation of Schröter, Beer and Mädler directed their attention especially to this region, and examined it more than 300 times between the years 1829 and 1837, with the result that the two craters were perfectly and singularly alike in size, shape, height of ring, depth of cavity, and even the position of some peaks upon the rings. I cannot say that I have ever been able to obtain a perfectly distinct view of this spot, from atmospheric causes; but every sight I have had of it has strengthened my impression that this remarkable similarity no longer exists. I first noticed a difference in the aspect of the two craters, 1855, Nov. 14. Since that time, in the occasional use of four instruments of very different size and power (one, an

object-glass of $5\frac{1}{2}$ inches by Alvan Clark, now in my possession), I have invariably felt convinced that neither in size, form, or depth, are those two craters any longer precisely similar, but that, on the contrary, under suitable angles of illumination, such as must have repeatedly occurred during the 300 examinations by Beer and Mädler, the difference between them is obviously so great as to indicate some permanent alteration in the surface during the space of twenty years.

May 12, 1859.

Sur la Variation Séculaire du Moyen Mouvement de la Lune.
Par M. de Pontécoulant.

(Communicated by the President.)

“ Dans la théorie de la Lune qui forme le quatrième volume de ma *Théorie Analytique du Système du Monde*,* j'avais adopté pour l'expression analytique du coefficient de *l'inégalité séculaire* de la longitude de la Lune, la formule trouvée par M. Plana dans son important ouvrage sur la même Théorie, mais depuis cette époque j'ai refait moi-même le calcul des différents termes qui composent cette expression, et j'ai trouvé, en négligeant les quantités dépendantes de l'excentricité et de l'inclinaison, pour déterminer l'inégalité dont il s'agit, l'équation suivante :—

$$\frac{dn}{ndt} = \frac{e'de'}{dt} \left(-3m^2 + \frac{2187}{64}m^4 + \frac{4455}{32}m^5 + \frac{480481}{768}m^6 + \frac{10244539}{576}m^7 \right).$$

“ Cette valeur coïncide avec celle de M. Plana jusqu'aux termes de l'ordre m^5 inclusivement et les différences que l'on remarque dans les coefficients des termes dépendants des puissances de m^6 et m^7 , tiennent sans doute à quelques incorrections qui se seront glissées dans la suite de ces longs calculs et qu'il sera facile de faire disparaître en les soumettant à une nouvelle révision. Mais si l'on compare l'expression précédente à celle donnée par M. Adams dans le No. du *Compte-Rendu Mensuel des Travaux de la Société Royale Astronomique* du 8 Avril, 1859 (p. 207), on voit que la discordance se fait sentir dès les termes de l'ordre m^4 , ce qui provient de la considération de nouveaux termes que M. Adams a cru devoir introduire dans les formules analytiques d'où cette expression est déduite et auxquels on n'avait point en égard jusqu'ici. Or l'influence de ces termes est considérable puis qu'elle ne va à rien moins qu'à réduire à $5''\cdot 7$, l'accélération du moyen mouvement lunaire dans un siècle, c'est à dire, à la moitié de la valeur à-peu-près

* *Théorie Analytique du Système du Monde*, vol. iv. p. 645.