

proposes to bring out triennially. The present two volumes form a continuation, and extend as far as § 5 of the second chapter in the second book. The author proceeds on the same lines as formerly, and places before the reader in a concise way all the new methods of development, measuring lenses, apparatus, &c., from the particulars of constitution which characterize developers down to the latest form of kodak or tie camera. Not only is each subject treated with the greatest care, but illustrations are numerous distributed. That which will add great value to the work as a whole is the insertion of references, for what, after all, is more annoying than having to wade through a great quantity of literature when the presence of one or two words would have eliminated all trouble? W.

The Reliquary: Quarterly Archaeological Journal and Review. Vol. VI. (New Series). (London: Bemrose and Sons, 1892.)

THIS volume consists of the four numbers of *The Reliquary* which have appeared during the present year. The contents include many things which do not quite come within the scope of NATURE; but it is satisfactory to be able to note that the writers, speaking generally, have done their work in a thoroughly scientific spirit. Mr. J. Lewis André contributes an interesting and well-illustrated paper on leather in the useful and ornamental arts, and a clear account is given by the editor of a part of an early dial, bearing runes, which he was lucky enough to find some months ago in the churchyard of Skelton, Cleveland. An illustration gives a good impression of the general character of the stone, the runes on which, according to Canon Browne, are "Danish." Among the other papers are two articles, by Mr. D. A. Walter, on ancient woodwork, and a discussion, by the Rev. A. Donovan, of some of the problems connected with the career of Columbus.

LETTERS TO THE EDITOR.

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Nova Aurigæ.

ON October 5 the Nova Aurigæ was again observed under favourable circumstances, and the observation as to precautions in focussing necessary on account of chromatic aberration of the refractor was amply verified. [NATURE, September 22, p. 489, in which note two corrections should be made: eighth line, for "varying" read "ranging," and fourteenth line, for "(?F)" read "(?G)"] The line near C was distinctly seen at times; but the blue and violet lines observed on September 14 were not seen; the three green lines were very distinct.

On October 14 the red line was much fainter, but there was an obvious bright line in the yellow, which may be the line which Dr. Copeland estimated as 580·1 on August 28 (NATURE, September 15), or may be that which has been measured several times at the Lick Observatory (*Astrophysics*, October, p. 717), and appears to have a wave length of about 575. It had escaped my notice before, but I was induced to look most carefully in the yellow by considerations arising out of an attempt to reconcile Mr. Barnard's observations of apparent nebulosity surrounding the Nova, as seen in the 36-inch refractor at Mount Hamilton, with my own observations of September 14. Mr. Barnard's "stellar nucleus" was the difficulty. There appears to be no doubt that the Nova is emitting a spectrum similar to that of a planetary nebula, but it seems to me necessary to have further spectroscopic evidence before it is established that nebulous extension can be seen; if it is to be seen with a simple eyepiece, it must be looked for in a reflecting telescope, as the following considerations will show.

Prof. Keeler's study of the chromatic correction of the Lick

refractor shows ("Pub. Ast. Soc. Pacific," Vol. II. p. 164) that the circle of aberration of F light on the focal plane for the D line has a diameter which is in terms of the focal length '000349. We may take this diameter as very nearly that of the circle of aberration of D light on the focal plane for the F line. Thus if a star emits only D and F light, and the F light is focussed, then the D light will fill a circle nearly 7" in diameter, and the star will look like a planetary nebula with a stellar nucleus. If the star emits light of wave lengths 500 and 575, then interpolation based on Keeler's measurements shows that round a stellar nucleus in the focus for wave length 500 there must be a circle of aberration of nearly 4" diameter.

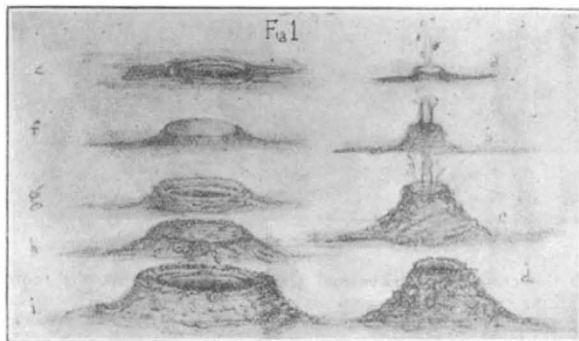
Mr. Campbell found lines of wave lengths 500 and 575 in the spectrum of Nova Aurigæ with respective intensities 10 and 1. Mr. Barnard describes the appearance of nebulosity as "pretty bright and dense," and as measuring 3" diameter. My own inability to see either the circle of aberration for the yellow line when the green was focussed, or the alleged nebulosity, may be explained in several ways (e.g. smaller aperture of object glass, climatic conditions, &c.). The spectroscope could probably decide the question at Mount Hamilton by showing whether the minimum length of any of the lines is that corresponding with 3" diameter on the slit. I have not been able to do more than observe that the yellow line is not visible when the 500 line is focussed on the slit of a spectroscope having an effective dispersion of two 60° prisms. H. F. NEWALL.

Observatory, Cambridge, October 24.

Formation of Lunar Volcanoes.

WHILE we have, on the lunar surface, a series of markings so evidently volcanic that no one thinks of applying any other term to them, we have on the other hand no explanation of their mode of formation which will stand examination. The explanation given by Messrs. Nasmyth and Carpenter in their splendid work on the moon, founded upon explosive expulsion of lava, fails to satisfy the mind when applied to wide craters with a low wall such as Shickard or Grimaldi, of which there are so many on the moon, and which look more like some disturbance in a semi-liquid surface than an accumulation of volcanic debris.

The umbrella-like eruption figured in Messrs. Nasmyth and Carpenter's book does not represent any phenomenon within our experience, as the erupted material (unless light enough to be driven by wind) invariably falls back into the neighbourhood of



the vent, and we could not conceive of its being shot neatly out twenty-five miles on every side to form the familiar ring.

An explanation of the mode of formation founded upon lunar tidal motion occurred to me about seventeen years ago, from observations on a cooling slag; but until the recent publication of Mr. Darwin's work on the history of the tides I was doubtful if that force were sufficient to account for observed results.

I had noticed that the rise and fall of a fused slag through holes in its solidifying crust, formed craters exactly like those in the moon; and I enclose a photograph of a piece of that slag in which is reproduced all the salient features of the lunar surface.

The mode of formation was as follows:—

The fused liquid (which was potash "black ash" containing a mixture of substances of very varied melting point) was still giving off some gas, which escaped as at *a* in Fig. 1, building up