

(cf. "Venus and the Mariner", *I.A.J.*, 6, p. 59, 1963). Also, the surface of Mars is found to be smoother than Venus, Mercury much rougher than Mars and about twice as rough as Venus.

Unusually Colourful Sunsets and sunrises appear to have been produced by the eruption of Agung Volcano on the island of Bali, Indonesia ($8^{\circ}25'$ Latitude South), on March 17, 1963, which caused thousands of deaths. Systematic observations are reported by Marjorie P. Meinel and A. B. Meinel, of Steward Observatory, Tucson, Arizona (*Science*, 142, p. 582, 1963). They find two layers of dust, probably volcanic ash suspended in the atmosphere, one at 22.3 km altitude, another fainter glow at 52.6 km. This is similar to the golden sunsets from the eruption of Krakatoa, Java, in 1883, when a glow at 18 km lasted for several years. On account of the low elevation, the golden twilight lasts but for a short while after the evening twilight, being succeeded by an unusual deep red glow quite close to the horizon. The phenomenon has been observed in November—January at Armagh Observatory; in September—October in Arizona, and some months earlier at Mount Stromlo, Australia (B.J. Bok); in August in Greece by the undersigned. A gradual spread from the southern toward the northern hemisphere seems to be indicated.

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Noctilucent Clouds are found to consist of non-volatile kernels, 0.5 - 5 micron in diameter, apparently of cosmic (meteoric) origin, surrounded by a coating of ice deposited on the cosmic dust in this coldest portion of the terrestrial atmosphere at 80 km (temperatures down to -114°C or 159°K , lower than the temperature of Jupiter's clouds). When the temperature is higher, or for other reasons, the ice is not deposited, fewer kernels are found and the noctilucent clouds are not seen. This follows from findings by rockets fired from the Kronogard range in northern Sweden (latitude 66°) in 1962. (C. L. Hemenway, R. K. Soberman, and G. Witt, *Nature*, 199, p. 269, 1963; R. K. Soberman, "Noctilucent Clouds", *Scientific American*, June 1963, pp. 51-59).

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Comet Humason 1961 e. Elliptical elements for this giant comet whose perihelion is beyond the orbit of Mars, have been published by B. G. Marsden (*I.A.U. Circ.* No. 1848, Nov. 18, 1963): perihelion $q = 2.133$ a.u., semi-major axis $a = 205$ a.u., period 2940 years, absolute magnitude $m_0 = 3.5$. This would correspond to a diameter of 30 km for the nucleus. A value of 41 km (*I.A.J.*, 6, p. 105, 1963), based on selectively treated estimates of magnitude ($m_0 = 2.85$) may be preferable.

Changes in the Earth's Axis of Rotation Due to Large Meteorite Collisions are polemically discussed by R. Gallant, and by F. Dacheille (*Nature*, 200, pp. 414, 415, 1963; and earlier). It is quite correct to say that such changes can be produced, and the effects calculated from the angular momentum