may be inverted[4] and how the intensities may change rapidly with time[5].

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The X-ray Source *Sco X*-3

TAMMANN[1] has advanced the suggestion that a supernova observed by Albumazar in A.D. 827 may be connected with the X-ray source *Sco X*-3 in the H II region No. 114.

Dr. Tammann depends on Lundmark[2] for the report of Albumazar. It has been shown, however, that Lundmark's notice depends on a long chain of references far removed from the original report[3]. The original report is in Ali ibn Ridwan's commentary to Ptolemy's *Tetrabiblos* and refers to an apparition seen by Ali and clearly dated April 30, 1006. Ali gives the celestial longitude of the observed object as Scorpio 15° (which need not refer to the constellation Scorpio). In fact, on the basis of a variety of medieval reports of this supernova, many of them contemporary with the event, the position of the supernova has been determined. Gardner and Milne[4] report that, on the basis of radio evidence, the remnant of this supernova is located at 14^h59^m6, $-41°42'$ (epoch 1950.0).

Thus, *Sco X*-3 (17^h23^m, $-44{\cdot}3°$ (1950)) is not related to the supernova to which Tammann referred.

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PLANETARY SCIENCE

"Westward Drift" of the Satellite Geoid

RECENTLY, Dr. Tuman[1] compared the mean free air anomaly as calculated by Jeffreys[2] with the satellite geoids calculated by Izsak[3] and Kaula[4], and on the basis of this suggested that the satellite geoid may have a westward drift. If I were to admit that Jeffreys's geoid of 1943 was adequate for a comparison with the satellite results I might accept that Dr. Tuman's work was meaningful, yet I would still maintain that it is remarkable that Dr. Tuman failed to use better solutions of satellite geoid than Izsak's 1963 solution (many have since been published, for example, by Izsak[5], by Anderle[6] and by Guier and Newton[7]). But I must reject that attitude which maintains that Jeffreys's solution of 1943 is adequate for such a comparison. The problem that Jeffreys dealt with was a statistical one. Without observations in vast oceanic areas at the time of his analysis, it was not possible for him to be certain of how much of the gravity anomaly should be attributed to terms of degrees 2 and 3 and how much of it should be attributed to those of higher degrees. The uncertainties in his longitudinal terms were thus considerable. It is significant that the general features of Jeffreys's geoid are compatible with those of the satellite geoid, but the reliability of its detailed features—for example, the longitudinal positions of the maxima and minima of the geoidal height—requires considerable care.

The longitudinal positions of the maxima and minima of satellite geoids determined by various authors are not consistent among themselves. For purposes of comparison, a few of the available results are listed in Table 1.

Table 1

Approximate locations	Jeffreys (ref. 2)	Izsak (ref. 3)	Izsak (ref. 5)	Guier and Newton (ref. 7)	Kaula (ref. 8)	Gaposchkin (ref. 9)
Gulf of Calif. (min)	—	125° W.	115° W.	135° W.	135° W.	130° W.
Andes (max)	—	90° W.	75° W.	75° W.	—	70° W.
Guinea Basin (min)	80° W.	45° W.	50° W.	70° W.	65° W.	65° W.
South Africa (max)	20° E.	20° E.	55° E.	50° E.	50° E.	50° E.
Indian Ocean (min)	85° E.	65° E.	70° E.	75° E.	70° E.	75° E.
New Guinea (max)	165° E.	180°	155° E.	150° E.	145° E.	155° E.
West Europe (max)	10° E.	5° E.	35° W.	10° W.	0°	15° W.

Besides statistical reasons, the close agreement among the last three columns also supports the implication that they are more accurate than the others. "Drifts" of these geoids from Izsak's 1963 one are observed of 5°–30° (both in eastwardly and in westwardly directions). A comparison between Gaposchkin's solution and that of Jeffreys shows that a geoidal minimum near Guinea Basin and a maximum near South Africa "drift" eastward by 15° and 30°, respectively.

Dr. Tuman used Vogel's[10] and Egyed's[11] works to support his observations. I have already questioned[12] Vogel's work as the assumptions used in his calculation of the undulations at the core-mantle boundary are not consistent with his results. Egyed supported Vogel's hypothesis by using a much simplified model. Serious objections to Egyed's work were raised by Coode and Runcorn[13] and myself[12]. A comparison of modern information on geomagnetism with satellite geoid shows no obvious correlation such as was suggested by Vogel.

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Arc Quench Gap in Vacuum

THE purpose of these preliminary experiments was to determine the effect of vacuum pressure from 10^{-1} torr (100μ) to 10^{-3} torr (0·01μ) on the stability of a d.c. arc. A pressure of 100μ is obtained in space at an altitude of 40 miles, while 0·01μ is attained at 70 miles.

During the launch phase of unmanned instrumented artificial satellites or space probes, vibration of the grounding cables interconnecting electronic modules can become severe enough for high-voltage arcing between improperly shielded copper conductors and parts of the spacecraft structure or the shroud to occur. In a number of cases, because of their advantageous strength to weight ratio, magnesium alloys are used as a structural material in a number of spacecraft applications[1].

In this preliminary laboratory investigation of d.c. arc stability, electrodes of oxygen-free high-conductivity copper and the magnesium–thorium alloy *HM*21-*A* were chosen as a possible combination of materials that have been used. For example, the shrouds protecting the