Letters

'The mean density of the Earth'

From Mr R. M. Jenkins

David Hughes' article in the February *Journal* (*JBAA*, **116**(1), pp.21–24) contained a table of the densities of some of the other solid bodies in the solar system. In general he concludes that the terrestrial planets have an uncompressed density of around 3740 kg m^{-3} and that solid satellites of the outer gas giant planets are about 1660 kg m^{-3}.

He explains why Mercury and the Moon don't fit into this scheme. However there are two other anomalies in his table. These relate to the densities of the Jovian satellites Io and Europa. Their densities differ from the other two Galilean moons, Ganymede and Callisto, being much closer to those of the asteroids. What is the explanation for this variation in density and what does it imply about these satellites' formation?

Rod Jenkins

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From Professor David W. Hughes

Many thanks for sending me a copy of Rod Jenkins' letter to the editor of *JBAA*, and his comments on my article on 'The mean density of the Earth', (*JBAA* **116**(1) pp. 21–24, 2006).

I think that the Jovian system is rather like a mini-solar system. Jupiter was formed at the centre of a cloud of gas, ice and dust, this cloud condensing subsequently to form the Galilean satellites. The temperature of Jupiter, as it condensed, was so high (well over 1000K) that this cloud had a large temperature gradient, and its own division into an inner 'terrestrial' region and an outer 'dirty-snowball' region. This shows in the density distribution:

	Radius (km)	*Mass (kg)*	*Density (kg m^{-3})*
Io	1821.3	8.9316×10^{22}	3529
Europa	1565	4.7998×10^{22}	2989
Ganymede	2634	14.8186×10^{22}	1935
Callisto	2403	10.7593×10^{22}	1851

Io and Europa were formed of earthy materials, whereas Ganymede and Callisto, forming beyond the jovian 'snow-line', were mixtures of earthy material and water snow.

David W. Hughes

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Venus inferior conjunction, 2006 January 13

From Mr John Vetterlein

The recent inferior conjunction of Venus on January 13 took place with the planet 5.5° north of the Sun. I have observed Venus at similar conjunctions when the separation from the Sun has been less, but on this occasion I decided to try to photograph as close to the event as possible, using a basic digital camera with a good zoom.

The day and evening of January 8 was clear, though the seeing was abysmal here in Orkney with the low altitude of Venus (12°16') when I observed through the 175mm Maksutov at 11h 25m (Figure 1).

Later I took myself off to another part of the island where I would be better placed to observe Venus with the naked eye. I was able to observe the planet with binoculars for some time before it disappeared behind the ridge of a nearby hill. At this stage (16h 04m) it was possible to see Venus with the naked eye. I took a series of photographs with a Panasonic Lumix FX20 at maximum zoom (432mm, 35mm equiv.) (Figures 2 & 3).

The phase is of course exaggerated but quite clear, despite the poor seeing.

Figure 1. Venus imaged on 2006 Jan. 08 at 11h 25m UT. 174mm Maksutov ×120, 1/1000 sec, ISO 350. *J. C. Vetterlein.*

Figure 2. Venus imaged on 2006 Jan. 08 at 16h 04m UT. Panasonic FZ20 432mm, 1/500 sec f/2.8, ISO 400. *J. C. Vetterlein.*

Figure 3. An enlargement of Figure 2.

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Where have all the observers gone?

From Mr A.W. Heath, former Director, BAA Saturn Section

In this day and age we are seeing more and more use of technology and less use of our eyes. Visual observing and its associated skills is becoming a minority activity in favour of CCD imaging. 'Push button' technology has its place of course, but we see far too many images the contrast and colour of which have been enhanced and therefore lose their scientific credibility.

My attention was drawn recently to an apparent red spot on a CCD image of Saturn, clearly an artifact of processing. CCD images are fine if one just wishes to produce 'pretty pictures', but to be of scientific value must be backed up with careful visual observation if they are to be accepted into astronomical archives.

Apart from some of the drawbacks already mentioned, such images can be off-putting to newcomers who buy a telescope and expect to see what the images in publications portray. Interest often quickly wanes and the newcomer turns interest elsewhere.

Observing is a skill which requires care and patience from which the observer can build a reputation. I have seen images of Saturn in respectable publications where the shadow of the globe on the ring has been shown on the wrong side! No visual observer would make that mistake.

The reputation of the BAA was built on the dedication of observers who used their eyes, recording what they actually saw at the telescope, not what they think should be there. Are we to lose this reputation because new technology has made imaging easier?

I have been a visual observer for over fifty years and have, in my humble way, recorded what I have seen to the best of my ability. The new generation are in danger of never acquiring visual skills and one must therefore ask if some of the features appearing on CCD images are really there. CCD has a place of course but must be in addition to and not in place of visual observation.

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