

Night sky in summer

QUAMRUL HAIDER

THE richness of the night sky in summer is exemplified by the splendour of thousands of brilliant stars and constellations scattered on a velvet backdrop. As darkness falls on balmy summer evenings, our perennial signpost, the Big Dipper in the constellation Ursa Major, can be seen in the northwest sky. Its handle will point toward Arcturus, the brilliant orange star that marks the constellation Boötes the Herdsman. To the southwest of

southeast of Vega is Altair, the third star of the Summer Triangle and the one farthest south. It is the second brightest of the three, but brightest star in the constellation Aquila. Just east of Altair is the constellation Delphinus the Dolphin. It is one of the smallest constellations in the sky.

To the north of Deneb lays the constellation Cepheus the King. Shaped rather like a bishop's hat, the southern corner of Cepheus is marked by a compact triangle of stars that includes Delta Cephei. This famous star is the prototype of the Cepheid variable star used to determine distances to distant galaxies. Sitting just northeast of the King is his wife Cassiopeia the Queen of Ethiopia.

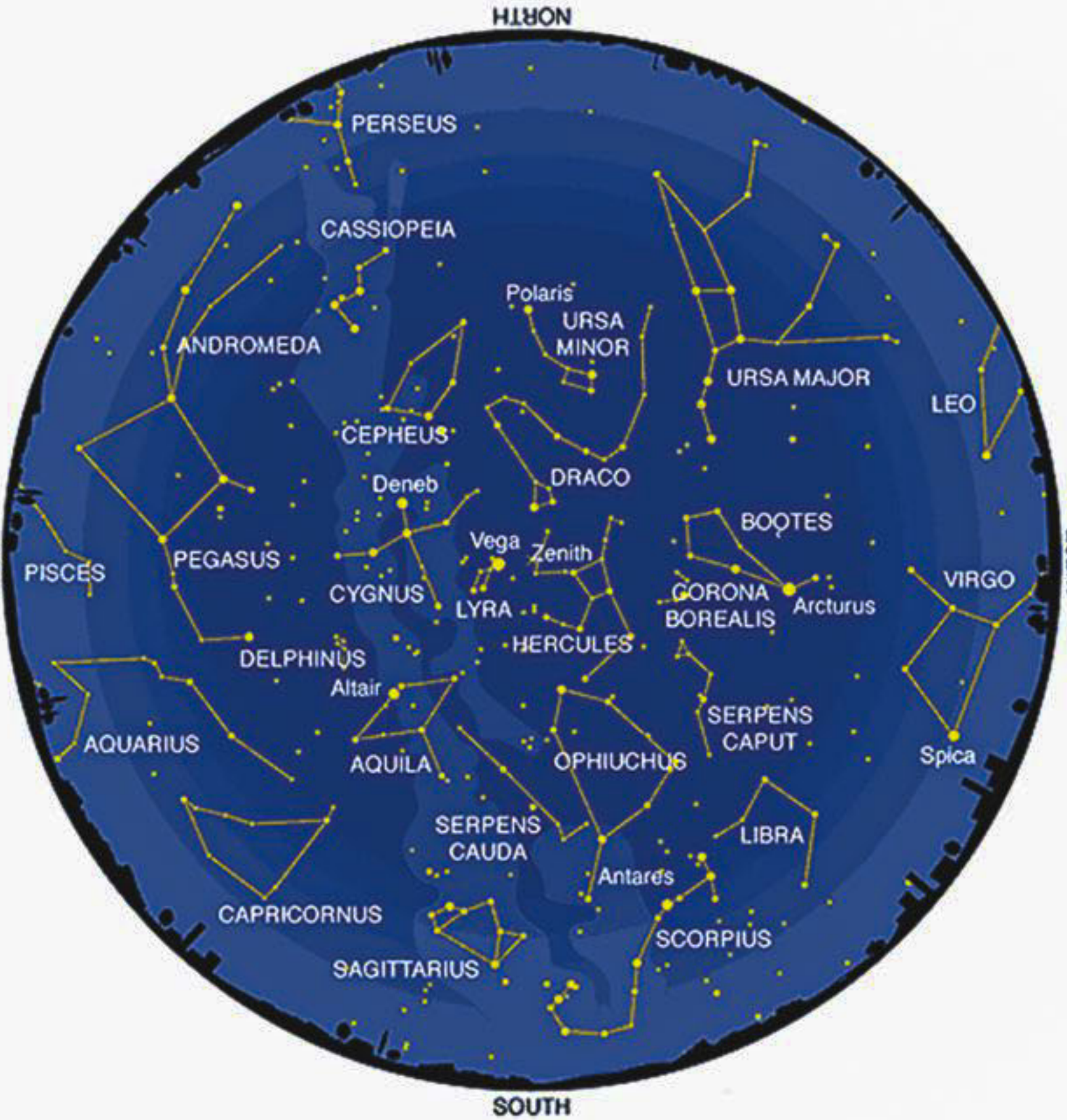
Hugging the southern horizon are the Zodiacal constellations Sagittarius the Archer and Scorpius the Scorpion. Scorpius is one of the few constellations that distinctly resemble the object after which it has been named. Its brightest star, Antares, is a fiery red supergiant star whose name means rival of Ares, the Greek God of War. Sagittarius has no obvious shape, though it is often nicknamed the Teapot; its brightest star is Sigma. Three other Zodiacal constellations visible in the summer months are Libra the Balance, Capricornus the Goat, and Aquarius the Water-Bearer. Libra can be seen in the southwestern part of the sky while the other two are closer to the southeastern horizon.

The region enclosed by lines joining Vega, Altair, Antares, and Arcturus is occupied by three large but faint and ill-formed constellations -- Hercules the Strongman, Ophiuchus the Serpent-Bearer, and Serpens the Serpent. Ophiuchus, though not officially classed as a constellation, intrudes into the Zodiac between Scorpius and Sagittarius.

Stretching from the northern horizon in Perseus, swinging through the constellation Cygnus overhead, and down to Sagittarius in the south, there will be a hazy patch containing hundreds of millions of stars, star clusters, nebulae, double stars, and variable stars. It is the Milky Way, our galactic home.

Filled with a treasure chest of sparkling jewels and the heavenly trinity, the beauty of the night sky in summer is for the eyes and mind to behold. Awed at the harmony in the seeming chaos of the heavens, a euphoric Ptolemy wrote: "When I follow at my pleasure the serried multitude of the stars in their circular course, my feet no longer touch the earth."

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Arcturus is Spica, which is the brightest star in the constellation Virgo the Maiden.

The "crown jewels" of the summer sky are three brilliant stars in the eastern sky -- Vega, Deneb, and Altair. They form a prominent pattern known as the Summer Triangle. They belong to different constellations though -- Vega in Lyra the Harp, Deneb in Cygnus the Swan, and Altair in Aquila the Eagle.

Vega, the first star to appear after sunset, will be high overhead. It is the brightest of the three -- brilliant blue-white that glistens like a diamond. Vega represents part of the Harp's handle, while four faint stars depict the instrument's main body where the strings are strung. Near Vega lies the double star, Epsilon Lyrae.

To the east of Vega lies the triangle's second star, Deneb. It marks the tail of the Swan. Deneb is a supergiant star that is about 70,000 times as powerful as the Sun. Below and to the

Perfume from bacteria

S. ASHRAF AHMED

MUCH of our characteristic body smells are attributed to the metabolic activity of the prevalent type of microorganisms a person harbours. This is due to the overwhelming presence of microorganisms in our body that one day may define human or animal as "made of microorganisms".

As a faculty at Dhaka University, I taught an organic chemistry class. To make this apparently boring subject interesting, I would offer (explain) my sleepy 8 AM-class with the chemical components of coffee (caffeine) brewed with cinnamon (stinky propionate), or offer a thirsty, sweaty and stinky noon-class with vanilla or vanillin (orthomethoxy-parahydroxy-benzaldehyde) ice cream flavour or the substitute for deer-musk perfume (dinitrobenzaldehyde). The trick was very effective! So, it is only natural that news of variations in the fragrance of vevitar grass oil (*Khas attar*), will not escape my attention.

In 2008, Italian scientists announced the discovery of two bacterial groups that are responsible for transforming sesquiterpene, the main component of the vevitar grass oil into secondary compounds giving rise to differences in fragrance. Microorganisms have long been used to produce almost all kinds of bio-molecules. From their discovery, the Italian scientists saw a great potential to advance fragrance and flavour chemistry by exploiting bacteria with biotechnology.

Then, *Chemical & Engineering News* gave an account ("The sweet smell of microbes," July 16, 2012) of the \$22 billion (2011 data) cosmetic and perfume manufacturers' efforts to produce plant fragrances in bacteria. After the price of patchouli oil increased following the recent volcanic eruptions in Indonesia, perfume buyers started to worry about all plant-derived fragrances. Valencene from orange and nootkatone from grapefruit are two different naphthalene derivatives belonging to sesquiterpenes. Others like rose (several cyclohex-butanone derivatives), sandalwood (isobornyl cyclohexanol), and jasmine (mostly benzyl acetate) fragrances have additional simpler chemicals.

Due to business secrecy, little of the biotechnological achievements are known, but several patent applications allowed a glimpse of the efforts to produce fragrance molecules. Typically a terpene synthase gene from a plant is inserted into the bacteria *E. coli* or the baker's yeast *S. cerevisiae*, and the whole fragrance synthetic route is engineered, so the microorganism can produce a specific sesquiterpene or another compound. One company has patented the microbial route to vanillin.

Genetic engineering of a soil bacterium has elucidated certain aromatic polyketide biosynthetic pathway (Acc Chem Res 42:631 (2009)). Similarly, aromatic shikimate pathway has been engineered in bacteria (Curr Opin Biotechnol 20:651 (2009)). In December of 2012, Swiss scientists cloned the machinery for synthesis of the highly priced sperm whale ambergis musk components in *E. coli* (JACS 134: 18900 (2012)). Therefore, it is only a matter of time to direct the friendlier microbe to produce the plant and animal fragrances of our liking. Bangalee scientists can

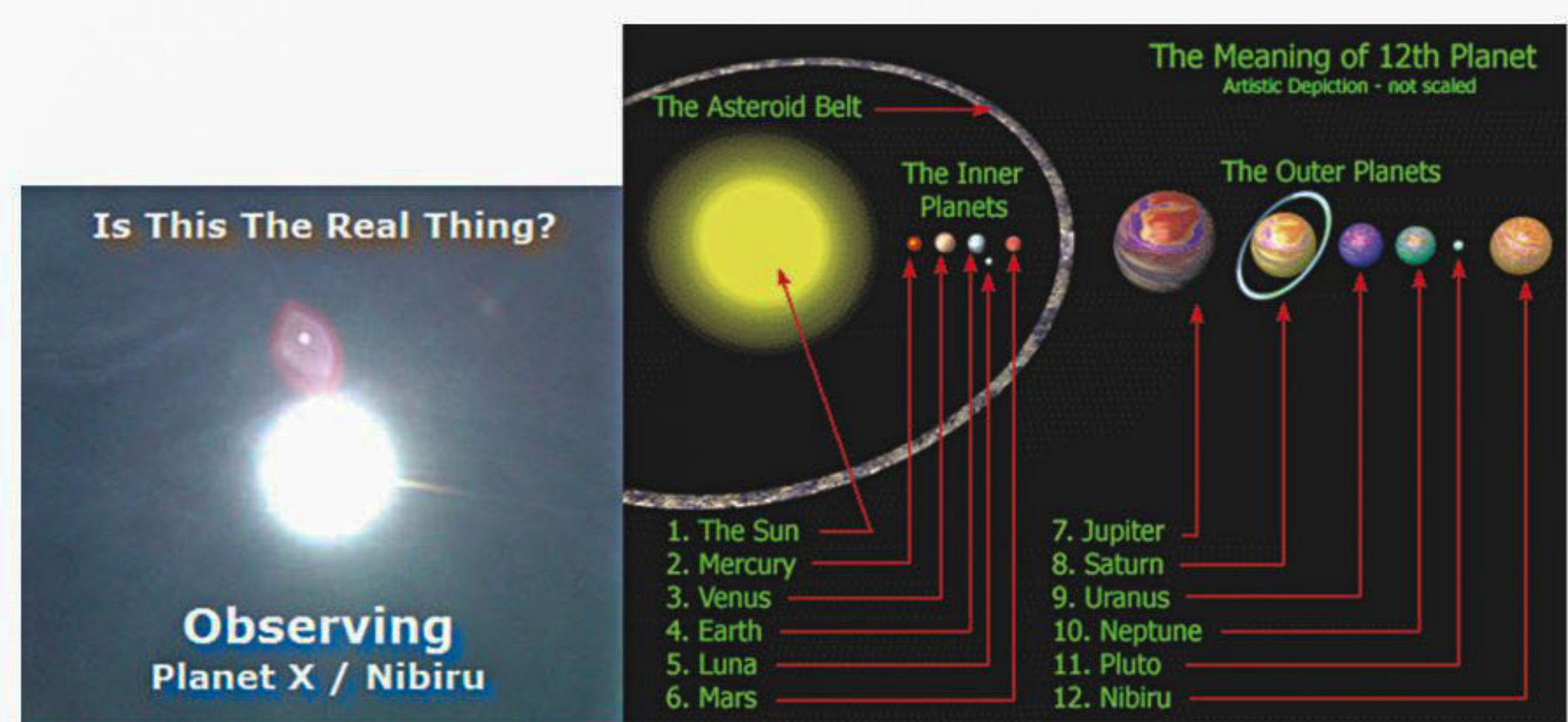


start working on our indigenous flowers producing unique fragrances; the field is barren!

Only imagination can lead to newer discoveries, technologies and styles. Our body harbours zillions of *E. coli* bacteria. How about transplanting some of their engineered, fragrance-producing relatives in our body? Shall we one day be able to suppress our body odor by such an *Eu de bacter* perfume?

The writer, a former Dhaka University teacher, is a biomedical scientist working in the USA.

Does planet 'X' exist?



SHAMEEMA NASRIN

WHAT do you really know about the existence of planet X? First of all the name "X" itself indicates it has no identification. However, how it got its name is at least known!

The year 2012 was full of rumours about the catastrophe that was coming because planet X would smash into the earth by December 2012. Well it didn't! Thus, it doesn't seem that planet X is actually up there; this assumption is also supported scientifically.

According to Dr. David Morrison, a NASA scientist, this prediction came to light through the discovery of Nibiru by the Sumerians; which is mistaken as planet X. Though it is claimed that the Sumerians made accurate astronomical predictions, they did not know about

Uranus, Neptune, and Pluto.

The photos present in the internet are not certified by NASA to be planet X/Nibiru and are just mere features near the sun. Also, as per the claims of amateur telescope users, the black rectangle in Orion in Google sky is just a processing error in the image stitching programme; and not a hiding place for planet X. Apart from all this, it is not possible for planet X to cross the orbit formations and hit the earth as all orbits are parallel to each other.

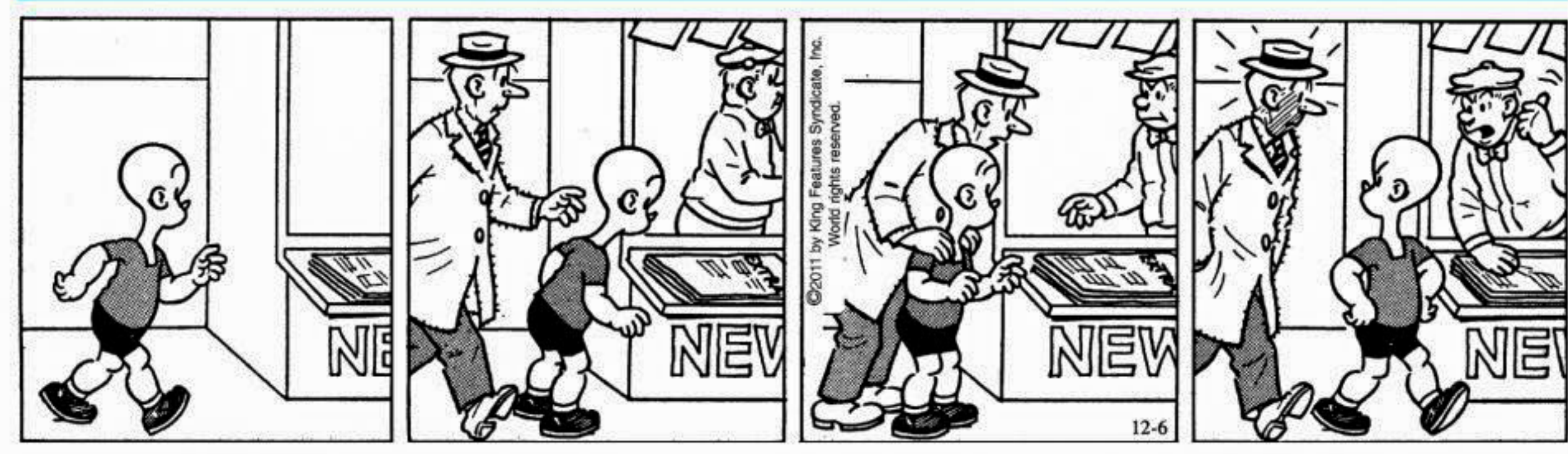
Finally, Dr. Morrison clarifies that even if planet X existed, the way it is claimed to be as per the predicted size and weight, it should have been visible to the naked eye at least by spring 2009. And none of us saw it!

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BEETLE BAILY by Mort Walker



HENRY by Don Trachte



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Saturday's Cryptoquip: THAT PECULIAR THIEF LOVES TO SWIPE VARIOUS SCARVES. IN FACT, TODAY HE WENT AND STOLE A STOLE.

Today's Cryptoquip Clue: O equals A

QUOTABLE Quotes

"There are people in the world so hungry, that God cannot appear to them except in the form of bread."

Mahatma Gandhi