

# A HIDDEN EARTH

## STARS

By Patrick Moore

**F**or several years now we have been hearing about "new planets." There are suggestions that our familiar companions—Mercury, Venus, Mars, and the rest—may not be all there is to the sun's family, that one member or more still await discovery. This idea is not new. A century ago it was widely thought that another planet could be found within the orbit of Mercury. It was even given a name: Vulcan.

While Vulcan does not exist, the case for a planet orbiting at the outer rim of the solar system is much stronger. This seems even more likely now that we have found remote Pluto to be more like a couple of ice balls than an Earth-style planet. I can give no proof, but in my view, Planet Ten is probably real. However, it is bound to be so faint that its discovery will be largely a matter of luck.

(*En passant*, we must stop referring to Pluto as the outermost planet. Since January, it has been closer to the sun than Neptune is, and this will remain true until 1999. I hasten to add that Pluto's path is tilted so sharply that there is no reason to fear a head-on collision with Neptune when they cross in their orbits.)

But what about a planet much nearer to

home, moving in a path similar to our own? This brings us to "Counter-Earth," a hypothetical planet that used to be taken very seriously and still crops up occasionally in the literature.

The theory is straightforward enough. Earth moves round the sun at a mean distance of slightly less than 148.8 million kilometers, taking 365.25 days to complete its circuit. The orbit is not perfectly circular. We are somewhat closer to the sun in December than in June, but the variation is not great. The other planetary orbits are also nearly circular, apart from that of the enigmatic Pluto. Moreover, Earth's orbit is stable. Our mean distance from the sun is unchanging, with no suggestion that it will vary in the foreseeable future.

Now consider a planet exactly on the far side of the sun, also moving at a distance of 148.8 million kilometers in a period of 365.25 days. Obviously, the earth, the sun, and the extra planet—the Counter-Earth—would be lined up. We earth-dwellers could not see Counter-Earth at all, because it would be drowned in the sun's glare. It was once said that conditions there might well be much the same as they are here, allowing for the existence of intelligent life. In fact, as recently as 15

years ago, a science-fiction film portrayed a Counter-Earth so like our own planet that an astronaut landing there found what seemed to be his own wife and colleagues waiting!

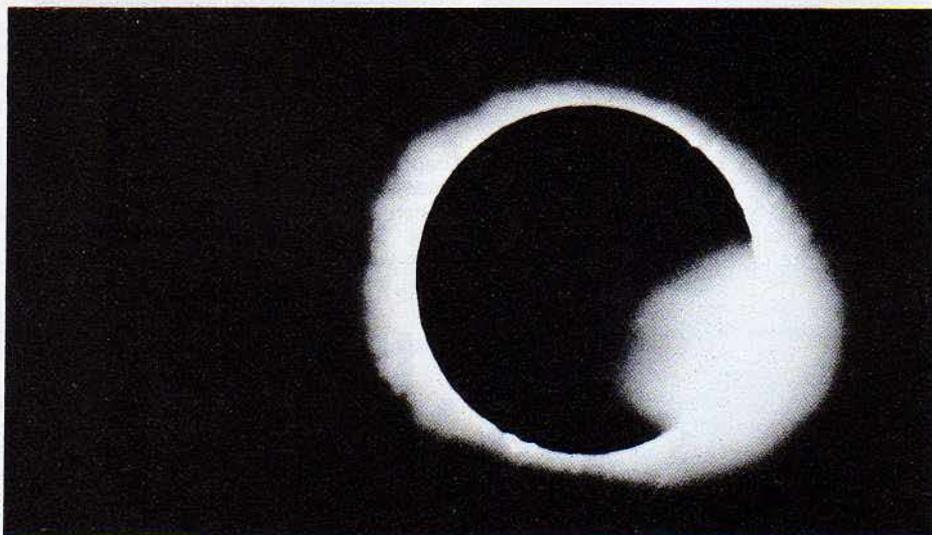
It is an intriguing theory and, of course, quite true that a planet exactly beyond the sun would be invisible. This applies to all the known planets. When a planet is directly beyond the sun, it is said to be at "superior conjunction." Mars passed through superior conjunction quite recently, which is why it has been absent from the night sky. We will not see it well again until later this year.

Unfortunately, science can be unromantic. Interesting as it would be to speculate about conditions on Counter-Earth, it would not be really profitable. There is an easy way to show that Counter-Earth does not exist.

All planets are perturbed—tugged aside in their orbits—by the gravity fields of other bodies. Because Earth and Counter-Earth would be separated by the whole diameter of their orbit, 297.6 million kilometers, the perturbing effects on them would differ. Result: Before long, the straight-line arrangement would be destroyed. Counter-Earth would swing out to the side of its arc, and we would see it. Moreover, Counter-Earth would produce its own perturbing effects upon Venus and the other planets, and these influences would have been detected long ago.

Nowadays, of course, there is direct proof that there is no massive, unknown body in our region of the solar system. Unmanned spacecraft have kept in touch with Earth even when almost on the far side of the sun, and their paths would have been violently twisted by the gravity of any lurking Counter-Earth. There could be some small asteroids moving more or less in our own orbit, but nothing more significant than that.

I have always thought that the Counter-Earth concept is one of the most fascinating in ancient lore. It is amusing to imagine a world perhaps identical to ours, with people of equal technological skill, less than 300 million kilometers away. And such a pity to realize that there is none! ☐



The sun: Though Vulcan and Counter-Earth are ruled out, new planets may yet be found.