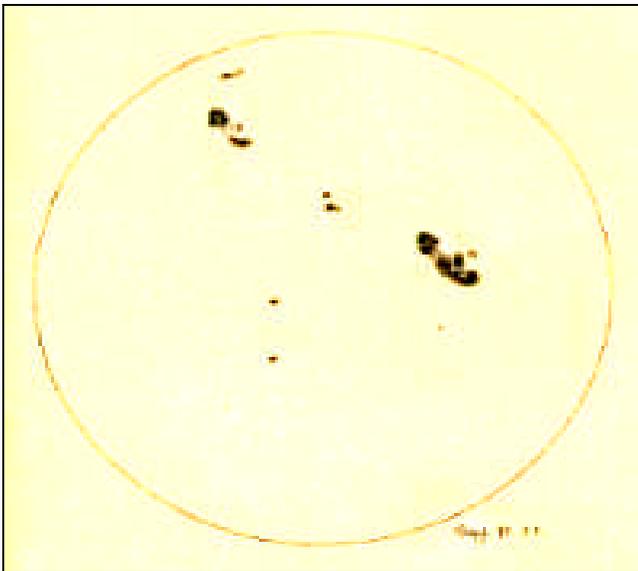


GALILEO'S RE-DISCOVERIES

The history of astronomy is littered with forgotten discoveries which, when later discovered again, were heralded as brand new knowledge. In fact there is nothing new under the sun (Ecclesiastes 1:9). The history of astronomy shows that human knowledge is not always progressive. Knowledge is often lost or forgotten, and many "new" discoveries may be only the regaining of old knowledge. **The "discoveries" of Galileo illustrate this concept.**

I. Galileo's Re-discovery of Sunspots

In 1609 Galileo focused his telescope on the sun and announced his discovery of sunspots. Sunspots appear to be small black blotches on the sun, though in fact, even the smallest sunspot visible to us is several times the size of the earth. Galileo's personal discovery of sunspots was not the first time sunspots had been known to mankind. In other words, "Galileo was not the discoverer of sunspots, as is sometimes claimed ..."¹



Drawing of Sunspots in Galileo's Notebook

More than a few ancient cultures knew of sunspots: "Sunspots were known to the ancient Greeks, but this knowledge was lost in the West and the spottiness of the Sun only rediscovered by Galileo in the early seventeenth century"² The ancient Chinese also recorded sunspot sightings in their astronomical logs.³

In contrast, Galileo claimed to be the first discoverer of sunspots, writing, "These spots have never been observed by anyone before me."⁴ Presumably Galileo was not making a dishonest claim of priority but was simply ignorant of the earlier knowledge.

II. Galileo's Re-discovery of Lunar Craters

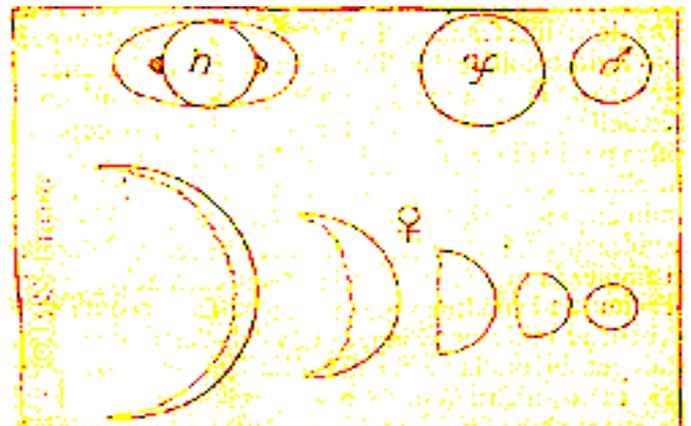
During a total solar eclipse, in the final seconds before totality, the moon does not cover the sun evenly. The last sliver of the sun's disk is split into spots of sunlight that modern astronomers call "Bailey's beads." **Ancient peoples recognized the occurrence of Bailey's beads, and they deduced from them that the moon must have a rough surface.** It must have mountains and valleys, and lunar mountains must cover the sun while shafts of sunlight continue to penetrate the lunar valleys.

By Galileo's time, however, the moon was believed to be perfectly smooth and incorruptible, like the sun.⁵ About the same time that Galileo telescopically observed sunspots, he telescopically observed, and duly announced, his sighting of lunar craters, the so-called "mountains of the moon."

Galileo thought, or at least claimed, that he had discovered the mountains of the moon. But he had simply *rediscovered* ancient knowledge that was lost. **Likewise, it is quite possible that many modern discoveries are, in fact, rediscoveries of ancient knowledge.** Ecclesiastes 1:11 refers to the forgetfulness of human memory -- "There is no remembrance of former things," the verse says, "neither shall there be any remembrance of things that are to come with those that shall come after." How much past knowledge has humanity forgotten?

III. Galileo's Re-discovery of the Phases of Venus

Venus exhibits phases noticeable through a telescope as it orbits the sun. "Venusian" phases look similar to lunar phases. Venus is smallest when it is farthest away from the earth, on the opposite side of the sun, and this is when it is seen in its full phase, fully illuminated by the sun's light. When Venus is on the same side of the sun as the earth, it shows its crescent phase.



Galileo's Drawings of the Phases of Venus

Around 1610 Galileo announced his sighting of the Venusian phases seen with his telescope. **However, the ancients without telescopes were aware of the phases of Venus.** In ancient times the crescent phases were dubbed "the horns of Venus."

Babylonian texts describe the horns of the planet Venus. "[T]he cuneiform texts ... speak of the right or the left horn of Venus. ... [T]he phases of Venus were observed already by the Babylonians ... Galileo, in the [1600s], was not the first to see them"⁶ As with sunspots and the lunar mountains, Galileo's "discovery" was actually a *rediscovery*.

IV. Galileo's (Possible) Re-discovery of the Galilean Moons

Galileo focused his early telescopes on Jupiter and announced his discovery of the four largest Jovian moons, to this day called the "Galilean moons" -- Io, Europa, Ganymede and Callisto. **There is evidence that some ancient peoples may have known of these moons:**

"In theory, Galileo's discovery could have been made long before the telescope. All four moons -- Ganymede, Callisto, Io, and Europa -- are bright enough to be seen with the naked eye ... [And] people have seen them. According to a manuscript unearthed ... in China, the astronomer Gan De noticed a 'small reddish star' attached to Jupiter in 364 B.C. It is believed he saw Ganymede, the brightest moon. To test that possibility, an astronomer in Peking recently asked half a dozen college students to look at Jupiter each night without a telescope and draw what they saw. All six located Ganymede, and three saw Europa as well."⁷

Notes

1 Theodore P. Snow, *Essentials of the Dynamic Universe*, West, 1984, p. 31.

2 John Gribbin, *The Death of the Sun*, Delacorte, 1980, p. 117.

3 *ibid.*, p. 124.

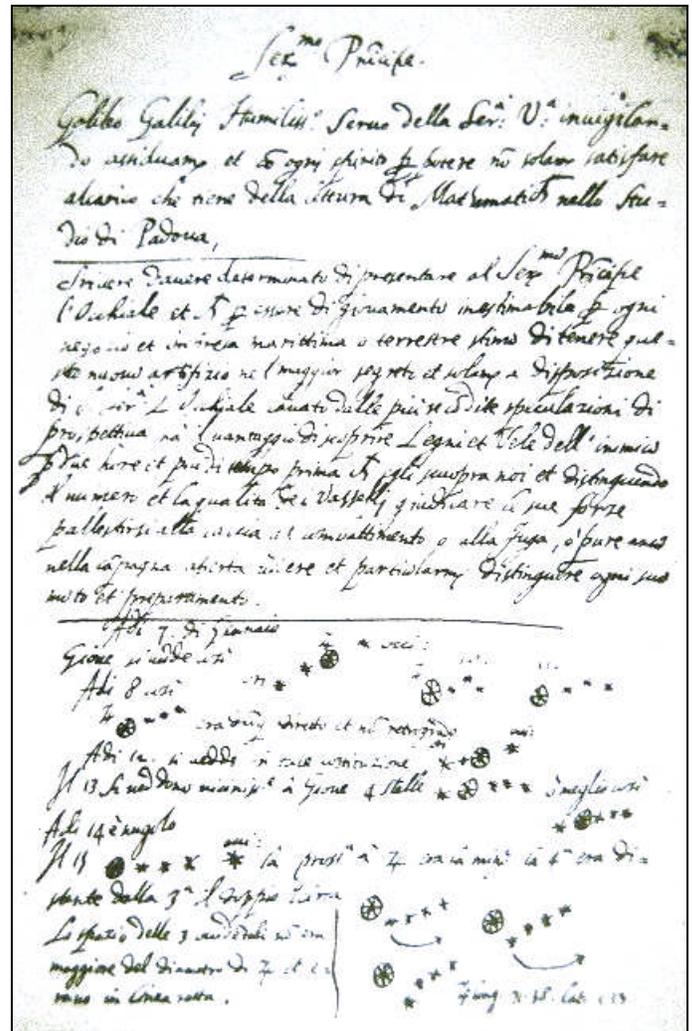
4 Holmes Boynton, editor, *The Beginnings of Modern Science*, Walter Black, 1948, p. 33.

5 Snow, *op. cit.*, p. 30.

6 Schaumberger, ?, *Die Horner der Venus (The horns of Venus)*, in F.X. Kugler, *Sternkunde und Sterndienst in Babel (Science and Religion of the Stars in Babylon)*,

Verlag der Aschendorffschen Verlagsbuchhandlung, Munster, 3rd Supplement, 1935, p. 302; English paraphrase in I. Velikovsky, *Worlds in Collision*, Doubleday, 1950, reprinted 1965, Dell, p. 167.

7 Terry Dunkle, "Looking for Ganymede," *Science* 82, Vol. 3 no. 6, 1982, p. 78.



Sketches of the Galilean Moons in Galileo's Notebook. The Galilean moons are the X's, sometimes in groups of four, circling the spherical Jupiter.