

# Clyde Tombaugh

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**Clyde William Tombaugh** (/ˈtɒmbaʊ/; February 4, 1906 – January 17, 1997) was an American astronomer. He discovered Pluto in 1930, the first object to be discovered in what would later be identified as the Kuiper belt. At the time of discovery, Pluto was considered a planet but was later reclassified as a dwarf planet. Tombaugh also discovered many asteroids. He also called for the serious scientific research of unidentified flying objects, or UFOs.

## Contents

- 1 Life and career
  - 1.1 Death
  - 1.2 Religion
  - 1.3 Family
- 2 Discovery of Pluto
- 3 Further search
- 4 Asteroids discovered
- 5 Interest in UFOs
- 6 Near-Earth satellite search
- 7 See also
- 8 References
- 9 Sources
- 10 External links

## Life and career

Tombaugh was born in Streator, Illinois, the son of Adella Pearl (Chritton) and Muron Dealvo Tombaugh, a farmer.<sup>[1]</sup> After his family moved to Burdett, Kansas in 1922, Tombaugh's plans for attending college were frustrated when a hailstorm ruined his family's farm crops.<sup>[2]</sup> Starting in 1926, he built several telescopes with lenses and mirrors by himself.<sup>[2]</sup> In order to better test his telescope mirrors, Tombaugh, with just a pick and shovel, dug a pit 24 feet long, 8 feet deep, and 7 feet wide. This cave provided a constant air temperature, free of air currents. It was also used by the family as a root cellar and emergency shelter.<sup>[3]</sup> He sent drawings of Jupiter and Mars to the Lowell Observatory, which offered him a job.<sup>[4]</sup> Tombaugh worked there from 1929 to 1945.

Following his discovery of Pluto, Tombaugh earned bachelor's and master's degrees in astronomy from the University of Kansas in 1936 and 1938.<sup>[2]</sup> During World War II he taught naval personnel navigation at Northern Arizona University.<sup>[2]</sup> He worked at White Sands Missile Range in the early 1950s, and taught astronomy at New Mexico State University from 1955 until his retirement in 1973.

### Clyde Tombaugh



Tombaugh at his family's farm with his homemade telescope (1928)

<b>Born</b>	Clyde William Tombaugh February 4, 1906 Streator, Illinois, U.S.
<b>Died</b>	January 17, 1997 (aged 90) Las Cruces, New Mexico, U.S.
<b>Nationality</b>	American
<b>Occupation</b>	Astronomer
<b>Known for</b>	Discovery of Pluto
<b>Spouse(s)</b>	Patricia
<b>Children</b>	Annette and Alden
<b>Relatives</b>	Clayton Kershaw (great-nephew) Matthew Tombaugh Richard Tombaugh
<b>Awards</b>	Jackson-Gwilt Medal (1931) Rittenhouse Medal (1990)

The asteroid 1604 Tombaugh,<sup>[5]</sup> discovered in 1931, is named after him. He discovered hundreds of asteroids, beginning with 2839 Annette in 1929, mostly as a by-product of his search for Pluto and his searches for other celestial objects.<sup>[2]</sup> Tombaugh named some of them after his wife, children and grandchildren. The Royal Astronomical Society awarded him the Jackson-Gwilt Medal in 1931.<sup>[6]</sup>

In 1980, he wrote a book "Out of the Darkness:The Planet Pluto" with Patrick Moore.<sup>[7]</sup>

In August 1992, JPL scientist Robert Staehle called Tombaugh, requesting permission to visit his planet. "I told him he was welcome to it," Tombaugh later remembered, "though he's got to go one long, cold trip."<sup>[8]</sup> The call eventually led to the launch of the New Horizons space probe to Pluto in 2006.

Following the passage on July 14, 2015 of Pluto by the New Horizons spacecraft the "Cold Heart of Pluto" was named Tombaugh Regio.

## Death

Tombaugh died on January 17, 1997, when he was in Las Cruces, New Mexico, at the age of 90. A small portion of his ashes was placed aboard the New Horizons spacecraft. The container includes the inscription: "Interned herein are remains of American Clyde W. Tombaugh, discoverer of Pluto and the solar system's 'third zone'. Adelle and Muron's boy, Patricia's husband, Annette and Alden's father, astronomer, teacher, punster, and friend: Clyde W. Tombaugh (1906–1997)".<sup>[9]</sup>

Tombaugh was survived by his wife, Patricia (1912–2012), and their children, Annette and Alden.<sup>[10]</sup>

## Religion

Tombaugh was an active Unitarian-Universalist, and he and his wife helped found the Unitarian Universalist Church of Las Cruces, New Mexico.<sup>[11]</sup>

## Family

Through the daughter of his youngest brother, Robert M., Tombaugh is the great uncle of Los Angeles Dodgers pitcher Clayton Kershaw.<sup>[12]</sup>

## Discovery of Pluto

While a young researcher working for the Lowell Observatory in Flagstaff, Arizona, Tombaugh was given the job to perform a systematic search for a trans-Neptunian planet (also called Planet X), which had been predicted by Percival Lowell and William Pickering.

Tombaugh used the observatory's 13-inch astrograph to take photographs of the same section of sky several nights apart. He then used a blink comparator to compare the different images. When he shifted between the two images, a moving object, such as a planet, would appear to jump from one position to another, while the more distant objects such as stars would appear stationary. Tombaugh noticed such a moving object in his search, near the place predicted by Lowell, and subsequent observations showed it to have an orbit beyond that of Neptune. This ruled out classification as an asteroid, and they decided this was the ninth planet that Lowell had predicted. The discovery was made on Tuesday, February 18, 1930,<sup>[7]</sup> using images taken the previous month.<sup>[13]</sup> The name "Pluto" was suggested by Venetia Burney, then an 11-year-old English schoolgirl, who died in April 2009, having lived to see the reclassification of Pluto as a dwarf planet. It won out over numerous other suggestions because it



Tombaugh created his photographic plates using this 13-inch astrograph

was the name of the Roman god of the underworld, who was able to render himself invisible, and because Percival Lowell's initials PL formed the first 2 letters. The name Pluto was officially adopted on May 1, 1930.

Following the discovery, starting in the 1990s, of other Kuiper belt objects, Pluto began to be seen not as a planet orbiting alone at 40 AU, but as the largest of a group of icy bodies in that region of space. After it was shown that at least one such body was more massive than Pluto, on August 24, 2006 the International Astronomical Union (IAU) reclassified Pluto, grouping it with two similarly sized "dwarf planets" rather than with the eight "classical planets".

Tombaugh's widow Patricia stated after the IAU's decision that while Clyde may have been disappointed with the change, since he had resisted attempts to remove Pluto's planetary status in his lifetime, he would have accepted the decision now if he were alive. She noted that he "was a scientist. He would understand they had a real problem when they start finding several of these things flying around the place."<sup>[14]</sup> Hal Levison offered this perspective on Tombaugh's place in history: "Clyde Tombaugh discovered the Kuiper Belt. That's a helluva lot more interesting than the ninth planet."<sup>[15]</sup>

## Further search

Tombaugh continued searching for some years after the discovery of Pluto, and the lack of further discoveries left him satisfied that no other object of a comparable apparent magnitude existed near the ecliptic. No more trans-Neptunian objects were discovered until (15760) 1992 QB<sub>1</sub>, in 1992.

However, more recently the relatively bright object Makemake has been discovered. It has a relatively high orbital inclination, but at the time of Tombaugh's discovery of Pluto, Makemake was only a few degrees from the ecliptic near the border of Taurus and Auriga<sup>[16]</sup> at an apparent magnitude of 16.<sup>[17]</sup> This position was also very near the galactic equator, making it almost impossible to find such an object within the dense concentration of background stars of the Milky Way. In the fourteen years of looking for planets, Tombaugh looked for motion in 90 million star images.<sup>[3]</sup>

## Asteroids discovered

Tombaugh is officially credited by the Minor Planet Center with discovering 15 asteroids, and he observed nearly 800 asteroids<sup>[18]</sup> during his search for Pluto and years of follow-up searches looking for another candidate for the postulated Planet X. Tombaugh is also credited with the discovery of periodic comet 274P/Tombaugh–Tenagra.<sup>[19]</sup> He also discovered hundreds of variable stars, as well as star clusters, galaxy clusters, and a galaxy supercluster.<sup>[2]</sup>

Asteroids discovered by Tombaugh

Designation	Discovery
2839 Annette	October 5, 1929
2941 Alden	December 24, 1930

3310 Patsy	October 9, 1931
3583 Burdett	October 5, 1929
3754 Kathleen	March 16, 1931
3775 Ellenbeth	October 6, 1931
3824 Brendalee	October 5, 1929
4510 Shawna	December 13, 1930
4755 Nicky	October 6, 1931
5701 Baltuck	November 3, 1929
6618 Jimsimons	September 16, 1936
7101 Haritina	October 17, 1930
7150 McKellar	October 11, 1929
(8778) 1931 TD <sub>3</sub>	October 10, 1931



Tombaugh compared his photographic plates using this blink comparator.

## Interest in UFOs

Tombaugh was probably the most eminent astronomer to have reported seeing unidentified flying objects and to support the extraterrestrial hypothesis. On August 20, 1949, Tombaugh saw several unidentified objects near Las Cruces, New Mexico. He described them as six to eight rectangular lights, stating: "I doubt that the phenomenon was any terrestrial reflection, because... nothing of the kind has ever appeared before or since... I was so unprepared for such a strange sight that I was really petrified with astonishment."

Tombaugh observed these rectangles of light for about 3 seconds and his wife saw them for about 1½ seconds. He never supported the interpretation as a spaceship that has often been attributed to him. He considered other possibilities, with a temperature inversion as the most likely cause.<sup>[20]</sup>

From my own studies of the solar system I cannot entertain any serious possibility for intelligent life on other planets, not even for Mars... The logistics of visitations from planets revolving around the nearer stars is staggering. In consideration of the hundreds of millions of years in the geologic time scale when such visits may have possibly occurred, the odds of a single visit in a given century or millennium are overwhelmingly against such an event.

A much more likely source of explanation is some natural optical phenomenon in our own atmosphere. In my 1949 sightings the faintness of the object, together with the manner of fading in intensity as it traveled away from the zenith towards the southeastern horizon, is quite suggestive of a reflection from an optical boundary or surface of slight contrast in refractive index, as in an inversion layer.

I have never seen anything like it before or since, and I have spent a lot of time where the night sky could be seen well. This suggests that the phenomenon involves a comparatively rare set of conditions or circumstances to produce it, but nothing like the odds of an interstellar visitation.

Another sighting by Tombaugh a year or two later while at a White Sands observatory was of an object of −6 magnitude, four times brighter than Venus at its brightest, going from the zenith to the southern horizon in about 3 seconds. The object executed the same maneuvers as in Tombaugh's first sighting.<sup>[21]</sup>

Tombaugh later reported having seen three of the mysterious green fireballs, which suddenly appeared over New Mexico in late 1948 and continued at least through the early 1950s. A researcher on Project Twinkle reported that Tombaugh "... never observed an unexplainable aerial object despite his continuous and extensive observations of the sky."<sup>[22]</sup>

According to an entry in "UFO updates", Tombaugh said: "I have seen three objects in the last seven years which defied any explanation of known phenomenon, such as Venus, atmospheric optic, meteors or planes. I am a professional, highly skilled, professional astronomer. In addition I have seen three green fireballs which were unusual in behavior from normal green fireballs... I think that several reputable scientists are being unscientific in refusing to entertain the possibility of extraterrestrial origin and nature."<sup>[23]</sup>

Shortly after this in January 1957, in an Associated Press article in the *Alamogordo Daily News* titled "Celestial Visitors May Be Invading Earth's Atmosphere," Tombaugh was again quoted on his sightings and opinion about them. "Although our own solar system is believed to support no other life than on Earth, other stars in the galaxy may have hundreds of thousands of habitable worlds. Races on these worlds may have been able to utilize the tremendous amounts of power required to bridge the space between the stars..." Tombaugh stated that he had observed celestial phenomena which he could not explain, but had seen none personally since 1951 or 1952. "These things, which do appear to be directed, are unlike any other phenomena I ever observed. Their apparent lack of obedience to the ordinary laws of celestial motion gives credence."<sup>[24]</sup>

In 1949, Tombaugh had also told the Naval missile director at White Sands Missile Range, Commander Robert McLaughlin, that he had seen a bright flash on Mars on August 27, 1941, which he now attributed to an atomic blast.<sup>[25]</sup> Tombaugh also noted that the first atomic bomb tested in New Mexico would have lit up the dark side of the Earth like a neon sign and that Mars was coincidentally quite close at the time, the implication apparently being that the atomic test would have been visible from Mars.

In June 1952, Dr. J. Allen Hynek, an astronomer acting as a scientific consultant to the Air Force's Project Blue Book UFO study, secretly conducted a survey of fellow astronomers on UFO sightings and attitudes while attending an astronomy convention. Tombaugh and four other astronomers, including Dr. Lincoln LaPaz of the University of New Mexico, told Hynek about their sightings. Tombaugh also told Hynek that his telescopes were at the Air Force's disposal for taking photos of UFOs, if he was properly alerted.<sup>[26]</sup>

## Near-Earth satellite search

Tombaugh's offer may have led to his involvement in a search for near-Earth satellites, first announced in late 1953 and sponsored by the Army Office of Ordnance Research. Another public statement was made on the search in March 1954, emphasizing the rationale that such an orbiting object would serve as a natural space station.<sup>[27]</sup> However, according to Donald Keyhoe, later director of the National Investigations Committee on Aerial Phenomena (NICAP), the real reason for the sudden search was because two near-Earth orbiting objects had been picked up on new long-range radar in the summer of 1953, according to his Pentagon source.

By May 1954, Keyhoe was making public statements that his sources told him the search had indeed been successful, and either one or two objects had been found.<sup>[28]</sup> However, the story did not break until August 23, 1954, when *Aviation Week* magazine stated that two satellites had been found only 400 and 600 miles out. They were termed "natural satellites" and implied that they had been recently captured, despite this being a virtual impossibility. The next day, the story was in many major newspapers. Dr. LaPaz was implicated in the discovery in

addition to Tombaugh. LaPaz had earlier conducted secret investigations on behalf of the Air Force on the green fireballs and other unidentified aerial phenomena over New Mexico. The *New York Times* reported on August 29 that "a source close to the O. O. R. unit here described as 'quite accurate' the report in the magazine *Aviation Week* that two previously unobserved satellites had been spotted and identified by Dr. Lincoln LaPaz of the University of New Mexico as natural and not artificial objects. This source also said there was absolutely no connection between the reported satellites and flying saucer reports."<sup>[29]</sup> However, in the October 10th issue, LaPaz said the magazine article was "false in every particular, in so far as reference to me is concerned."<sup>[30]</sup>

Both LaPaz and Tombaugh were to issue public denials that anything had been found. The October 1955 issue of *Popular Mechanics* magazine reported: "Professor Tombaugh is closemouthed about his results. He won't say whether or not any small natural satellites have been discovered. He does say, however, that newspaper reports of 18 months ago announcing the discovery of natural satellites at 400 and 600 miles out are not correct. He adds that there is no connection between the search program and the reports of so-called flying saucers."<sup>[31]</sup>

At a meteor conference in Los Angeles in 1957, Tombaugh reiterated that his four-year search for "natural satellites" had been unsuccessful.<sup>[32]</sup> In 1959, Tombaugh was to issue a final report stating that nothing had been found in his search. His personal 16-inch telescope was reassembled and dedicated on September 17, 2009 at Rancho Hidalgo, New Mexico (near Animas, New Mexico), adjacent to *Astronomy*'s new observatory.<sup>[33]</sup>

## See also

- Tombaugh (Martian crater)
- Tombaugh Cliffs
- Tombaugh Regio

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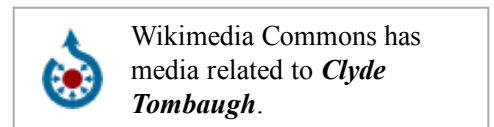
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## External links

- Many biographical articles on Clyde Tombaugh ([http://www.astro.uni-bonn.de/~pbrosche/persons/pers\\_t.html](http://www.astro.uni-bonn.de/~pbrosche/persons/pers_t.html))
- Biography, Interviews, Photo Gallery of Clyde Tombaugh (<http://www.achievement.org/autodoc/page/tom0gal-1>), achievement.org
- Illinois proposes a Pluto Day and reinstate Pluto as a Planet in honor of C. Tombaugh: Illinois General Assembly, Senate Resolution SR0046 2/26/2009 (<http://www.ilga.gov/legislation/96/SR/PDF/09600SR00461v.pdf>)



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Categories: 1906 births | 1997 deaths | American astronomers | American Unitarian Universalists | Discoverers of asteroids | Discoverers of trans-Neptunian objects | New Mexico State University faculty | Northern Arizona University alumni | People associated with Pluto | People from Flagstaff, Arizona | People from Las Cruces, New Mexico | People from Pawnee County, Kansas | People from Streator, Illinois | Planetary scientists | Scientists from Kansas | Space burials | University of Kansas alumni

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