

Unseen Companion

By pushing measurements to their limits, astronomers have tentatively identified a fourth star having an unseen companion—By Ann Ewing

► A FOURTH STAR has been tentatively identified as having an unseen companion, either a large planet or a small star.

The provisional identification was made by Dr. Peter van de Kamp, director of Swarthmore College's Sproul Observatory, Swarthmore, Pa., where observations of the other three stars having unseen companions were made.

Dr. van de Kamp told SCIENCE SERVICE that the tenth magnitude star is relatively close to the sun. DB plus five degrees 1668, as the star is known, is 13 light years away, or 78 million million miles.

The possible unseen companion was detected only by pushing measurements to their limit. Astronomers hope future observations will confirm the tentative identification.

Detected by Wobble

Unseen objects circling a visible star are detected by measuring the amount of wobble they produce in the motion of the main star. The companion of 1668 appears to have twice the mass of Jupiter, but this figure may have to be changed, Dr. van de Kamp said.

Confirmation of this calculation would strengthen the belief of many scientists that there are other planets in the universe besides the earth and the eight others in the solar system. Discovery of a planet named Barnard's Star B, which is a dark, lifeless giant half again as heavy as Jupiter, was reported by Dr. van de Kamp in April 1963.

Identifying this object as a planet indicated that the universe abounds with planets. Some astronomers estimate that at least 100 million of them have some form of life.

The two stars in addition to Barnard B that are known to have unseen companions are the 61 Cygni system, discovered in 1943 by Dr. Kaj Aa. Strand, now director of the U.S. Naval Observatory, and Lalande 21185, discovered in 1960 by Dr. Sarah Lee Lippincott.

Problems in Measuring

The problems involved in measuring the motions of stars were reported by Dr. van de Kamp to the Pennsylvania Academy of Science meeting in Bethlehem, Pa. He cited the 1668 object as an example of the difficulties involved in deciding whether or not the variations measured on photographic plates were real.

Dr. van de Kamp also said that he

and two graduate students were reporting the discovery of two new stellar systems to the sun's family of some 55 nearby stars. They are the first additions to be made to the sun's neighboring stars in 20 years.

Although both stars have been known before, they were not identified as being close to the sun until their motions were measured by Chao-Yuan Yang and Michael D. Worth. The three astronomers are reporting details of their measurements in the Publications of the Astronomical Society of the Pacific.

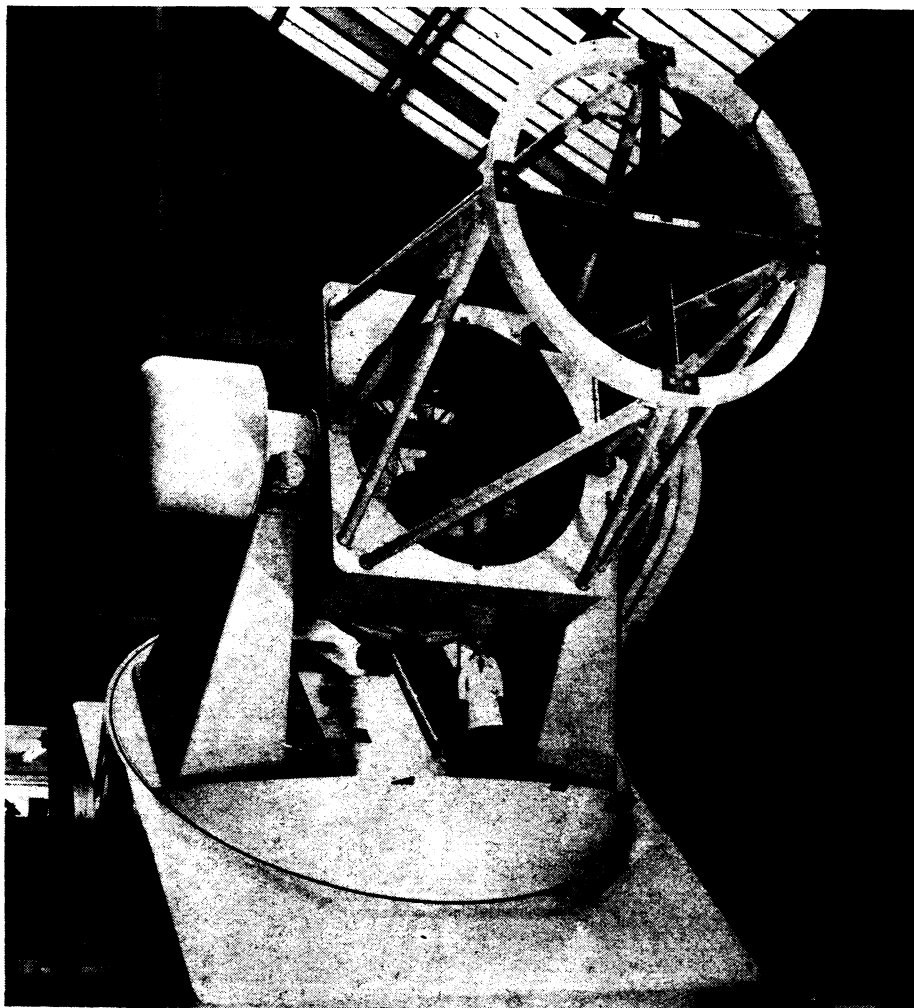
Nearby stars are considered to be those within 17 light years, or slightly more than 100 million million miles of the sun. One of the two stars is single, like the sun. The other is a double star.

The double star is of particular interest to astronomers because it consists of a red dwarf and a white dwarf. Observations to be made within the next 10 years should give the masses of the two stars, Dr. van de Kamp predicted.

White dwarf stars are hot stellar clinkers, believed to be the dying stage in stellar evolution. For only a few such stars is the mass known.

Nearby stars are detected by extremely precise measurements of their motions during a long period of time. The amount of motion measured is incredibly small but it can be determined. Dark stars or possible planets of stars that can be photographed are detected by precise measurements of wobbles in the main star's path produced by the gravitational attraction between the objects.

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F. C. Livingstone

OPTICAL TELESCOPE—The Isaac Newton telescope in the plant of Sir Howard Grubb, Parson's and Co., Newcastle-upon-Tyne, was made possible by the gift of a 98-inch Pyrex dish mirror from the MacGregor Trust of Michigan. Expected to be in use by the end of 1966, it is the largest optical telescope in Europe. The concave mirror is 98.2 inches in diameter, weighs 9,000 pounds and reflects starlight by a reflecting coat of aluminum evaporated onto the surface. →