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THE EARLY LIFE OF E. E. BARNARD
(Part II)

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In January 1881, Edward Barnard married Rhoda Calvert, a sister of two brothers who had worked as artists since 1875 for the Poole Photographic Gallery. On May 21 of the year of his marriage Barnard discovered his first comet near α Pegasi, and noted it again on the following night, but could not find it on subsequent nights. This comet was never listed or named because young Barnard, at that time, had no knowledge of how or to whom to announce such a discovery. He never counted it among his own discoveries, although there is no doubt in the minds of his colleagues, nor in his own mind, as to the validity of the observations.

This experience nurtured a deep interest in comets, indeed, a love which persisted through his career. He then began a systematic comet search, and on September 17 of the same year discovered Comet 1881 VI and announced it according to the proper procedures. He was delighted to learn that a prize of $200 was being offered by H. H. Warner of Rochester, New York, for the discovery of unexpected comets. Upon the award of this prize, Barnard and his bride deliberated as to the best use of the money and they decided to try to build a home of their own in a location that would provide a good view of the sky. As he later described the deci-

sion, "Times were hard in the last of the seventies and the first of the eighties, and money was scarce. It had taken all that I could save to buy my small telescope. After some saving and some borrowing and mainly a mortgage on the lot, we built a little

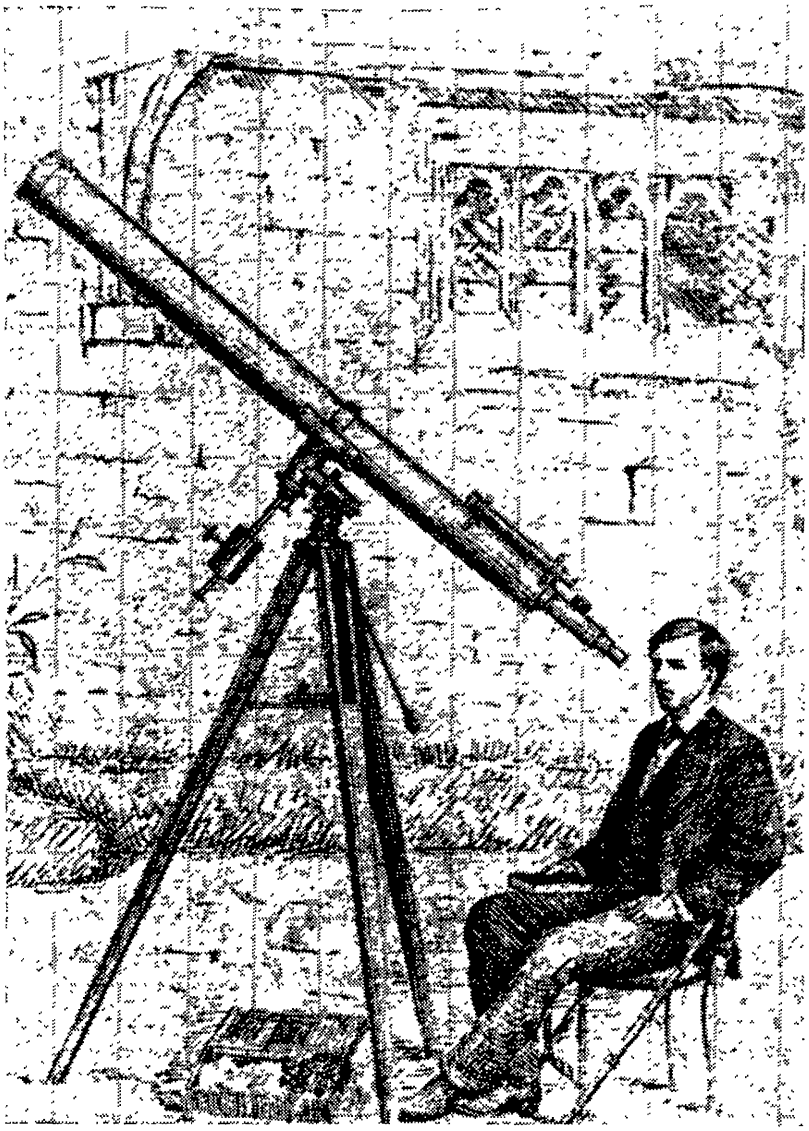

Fig. 1 — A sketch of E. E. Barnard, drawn by his brother-in-law, P. R. Calvert, and the 5-inch telescope with which he discovered his first comets.

frame cottage, where my mother, my wife, and I went to live. Those were happy days, though the struggle for life was a hard one, with working from early to late for the means of a bare existence and the hope of paying off the mortgage, and sitting up all the rest of the twenty-four hours hunting for comets.

"We could look forward only with dread to the meeting of the notes that must come due. However, the hand of Providence seemed to hover over our heads; for when the first note came due a faint comet was discovered wandering along the outskirts of creation, and the money went to meet the payments. The faithful comet, like the goose that laid the golden egg, conveniently timed its appearance to coincide with the advent of those dreadful

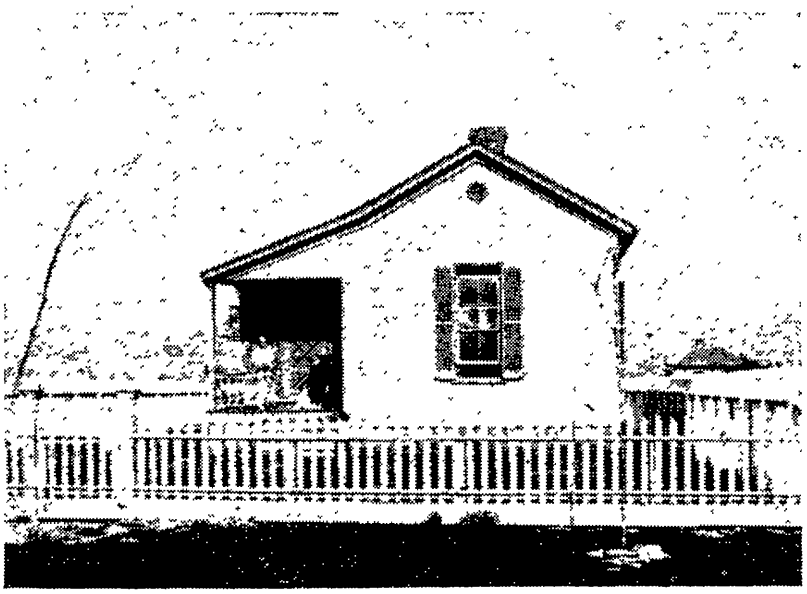

Fig. 2 — The "Comet House", Barnard's home in 1882 paid for by cash awards for comet discoveries. His mother is seated and his wife is standing on the porch. In the background is Vanderbilt University's first building.

notes. And thus it finally came about that this house was built entirely out of comets. This fact goes to prove further the great error of those scientific men who figure that a comet is but a flimsy affair after all; for here was a strong, compact house—albeit a small one—built entirely of them. True, it took several good-sized comets to do it; but it was done nevertheless."

The new home became known as the "Comet House" and it stood until recently when it was swept away to make room for a parking lot. Edwin B. Frost, Director of the Yerkes Observatory for many years, said "Few indeed are the astronomers whose keen eyesight and extraordinary diligence in the quest for celestial discovery have literally provided themselves a roof to sleep under. It was very little, however, that he slept under that roof when the sky was clear."

In 1882, a month after his second comet discovery (1882 III), he had a remarkable experience as recorded here in his own words. "My thoughts must have run strongly on comets during that time, for one night when thoroughly worn out I set my alarm clock and lay down for a short sleep. Possibly it was the noise of the clock that set my wits to work or perhaps it was the presence of that wonderful comet which was then (October 1882) gracing the morning skies, or perhaps, it was the worry over the mortgage and the hopes of finding another comet or two to wipe it out. Whatever the cause, I had a most wonderful dream. I thought I was looking at the sky which was filled with comets, long-tailed and short-tailed and with no tails at all. It was a marvelous sight, and I had just begun to gather in the crop when the alarm clock went off and the blessed vision of comets vanished. I took my telescope out in the yard and began sweeping the heav-

ens to the southwest of the great comet in the search for comets. Presently I ran upon a very cometary-looking object where there was no known nebula. Looking more carefully I saw several others in the field of view. Moving the telescope about I found that there must have been 10 or 15 comets at this point within the space of a few degrees. Before dawn killed them out I located six or eight of them. That morning I sent a telegram to Dr. Lewis Swift, notifying him of the discovery of six or eight "comets" at a certain position. Whether he thought I was trying to form a comet trust or had suddenly gone demented has never been clear to me, for he unfortunately did not forward the telegram. The observations were amply verified, however, both in this country and in Europe, by two other observers who saw some of these bodies. Unquestionably they were a group of small comets or fragments that had been disrupted from the great comet, perhaps when it whirled round the sun and grazed its surface several weeks earlier with the speed of nearly four hundred miles a second. The association of this dream with the reality has always seemed a strange thing to me."

In the spring of 1883 Barnard began his association with Vanderbilt University, then ten years old, in a most unusual way. His intellectual and scientific potential were brought by numerous friends to the attention of the president who soon recognized the young man's promise and persuaded the chancellor to take on Barnard as both instructor and student. The chancellor was initially reluctant to agree because of Barnard's lack of a school background but arranged nevertheless to have him enrolled as a special student, and his studies were restricted to a non-degree curriculum. His position as instructor of Practical Astronomy was nonethe-

less confirmed.

For Barnard the opportunity to acquire some university training was compelling even though it meant having to give up his position in the photographic studio. With a young wife and an invalid mother to support, taking a new position paying only $300 per year was a hazardous undertaking. But his wife was willing to struggle through the frugal years with him if it could mean dedicating his life to astronomy. To ease the burden and to help young Barnard, the university provided him with a dwelling located on the campus. The attraction of being put in charge of a permanently mounted 6-inch telescope and other substantial equipment in a new observatory was adequate reward.

As a special student very much preoccupied with his independent scientific work, he was often joked by his fellow-students. He gave the impression of being awkward and shy, and always rushed into his classes at the last minute and out of breath.

In four years of study Barnard achieved the foundations of an education, although he was not given a degree until later, after his work at the Lick Observatory brought him fame. During his years at Vanderbilt he continued his arduous observations, discovering seven more comets, independently establishing the reality of the gegenschein, and in discovering a new double star, β Capricorni. This latter was remarkable and illustrates his keen sense of scientific intuition. Burnham, the famous double-star observer, recorded the event as follows: "Barnard was observing an occultation of the well-known star β Capricorni by the moon. When the moon passed in front of the star he noticed that instead of disappearing instantly the process was gradual. The interval between the diminution and

the complete extinction of the light occupied only a few tenths of a second. Barnard called attention to this curious phenomenon in one of the astronomical journals and suggested that the most probable explanation was that the star was really composed of two stars so extremely close together that in the ordinary telescope they appeared as one star. It was also inferred that one of the stars must be considerably brighter than the other, from the fact that at the beginning of this fraction of a second the change in brightness was less than at the end." Subsequent examinations of the star with the 6-inch telescope with which the occultation was observed failed to show its binary character under the highest powers. The 18½-inch telescope of the Dearborn Observatory at Chicago was turned on the star by Burnham and it was seen to be a close and unequal double star (separation 0″8; mags., 6.1, 10.0), one which taxed the powers of that splendid instrument."

In 1887, when E. S. Holden was bringing together a strong group of astronomers to start work at the Lick Observatory, Barnard was among those invited to join the staff and he accepted the new position with much enthusiasm. Such an offer must have seemed to be unbelievable to him who just a few years earlier had been made grievously aware of the almost negligible chance of his making any useful contribution to astronomy!

At the Lick Observatory his brilliant career began and he became well known by more than 800 papers in the scientific journals treating of many remarkable discoveries and painstaking measures of the heavenly bodies. His observations were of the highest order and included many fields, such as comets, planets (especially Jupiter), satellites, the Milky Way, dark areas, stellar proper motions,

parallaxes, double stars, clusters, and astronomical photography. His accomplishments brought him the highest honors, awards, and medals from learned societies at home and abroad.

A few years after his discovery of Jupiter's Fifth Satellite at the Lick Observatory he was awarded the Doctor of Science degree by Vanderbilt University in recognition of his scientific contributions and his earlier college studies. On this occasion and later ones he delivered public lectures to such large audiences in Nashville that a theater had to be used and on one the Ryman Auditorium—originally an evangelical tabernacle but in more recent times the home of the Grand Ole Opry.

Besides being characterized by humility, integrity, and the utmost honesty, Barnard was an indefatigable observer, literally watching the sky at every favorable opportunity during his adult life with whatever instrument was available from a 6-inch comet seeker to the 40-inch Yerkes refractor. His mood on each successive day reflected the condition of the sky of the preceding night.

When the American Astronomical Society met in Nashville in 1953 the welcoming officer of the University mentioned several ways in which tribute had been paid by the University to Barnard's memory, including the dubious and most inappropriate one of naming one of Vanderbilt's dormitories after him—a man who was never known to sleep.