The author here stands at the projector in the center of the planetarium chamber, which is formed by a 22-foot steel dome, the lower four feet of which may be raised flush with the ceiling when the room is used as a lecture hall. The Barnard Astronomical Society holds its meetings in this room. All photographs with this article are by Ken Spain.

The New Arthur J. Dyer Observatory

BY CARL K. SEYFERT, *Vanderbilt University*

EARLY in March of 1946, the writer received a telegram from Vanderbilt University in Nashville, Tenn., stating that they had a telescope mirror and were looking for an astronomer to go with it. Snow was still on the ground in Cleveland, Ohio, where I had been working at the Warner and Swasey Observatory for four years. Astronomers don't often have a chance to go south when the weather is dreary, and I welcomed the opportunity for a pleasant trip.

In Nashville, the grass was green, birds were singing, and roses were blooming. Added to nature's attractions, the opportunity offered by Vanderbilt appealed to me so much that I accepted, arriving in Nashville with my family in September.

On the university campus, there was a small observatory, named for Edward Emerson Barnard, housing a 6-inch Cooke refractor and a 4-inch meridian circle. During the war years Vanderbilt had been given a 24-inch telescope mirror by the Ferguson family of Cleveland, on the condition that ways and means be found to build a telescope around it and a modern observatory to house it. The finding of these "ways and means" provided me for the next six years with the most exciting, sometimes heartbreaking and certainly backbreaking days of my life. What spurred me on more than anything else was the warmhearted generosity of the people who helped us with our dream. Eighty firms and individuals, mainly in Nashville, co-operated in the new observatory project.

The campaign began with lectures on astronomy and the proposed observatory to various civic groups. There was already considerable interest in astronomy in Nashville since Barnard, the noted astronomer, had been born here.

After three years, such lecturing began to pay off. Following a talk at the Rotary Club, Arthur J. Dyer, founder of the Nashville Bridge Co., asked how to build a sundial for his home in Brentwood, a suburb of Nashville. I supplied him with the necessary information. This was probably the most expensive sundial ever built, since Mr. Dyer, for whom the observatory is named, and his bridge company became our largest contributors.

Mr. Dyer, a most energetic octogenarian, walked with me over most of the hills in and around Davidson County searching for the most suitable site. We found an ideal location consisting of a flat hilltop 1,100 feet high and nine acres in extent, in the Brentwood Hills 10 miles south of Nashville. Howard Gardner persuaded his brother, Carl, owner of the property, who lived in Morristown, N. J., to donate the land for the observatory site.

A road was the next problem, since the hilltop was more than a mile from the highway. The Oman Construction Co. agreed to use its machines and do the grading as a gift in memory of John Oman, Jr. Metal culverts were donated by another concern, dynamite by another, equipment and labor for blasting by a fourth, a black-top surface by still another, and finally the gravel topping by a sixth organization. The Nashville Electric Service Co. installed 2,000 feet of power line to the top of the hill as a gift.

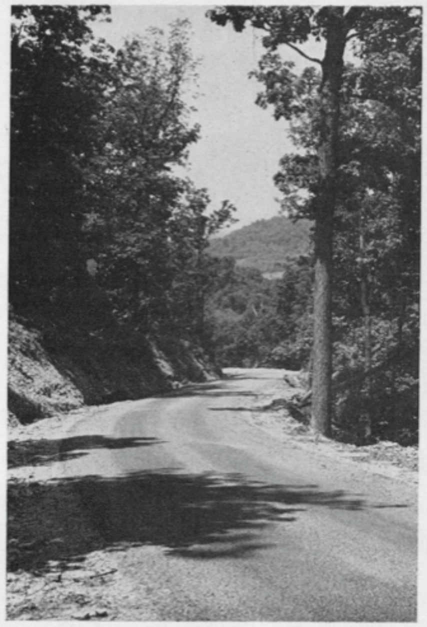
In Chattanooga, Tenn., there lived a friend of mine, the late Clarence T. Jones, an amateur astronomer of some note. He was an architect and had built and donated to the university there a very fine small observatory. He and his son, Bruce Jones, agreed to prepare the plans and engineering drawings for the observatory at a very nominal sum.

By this time it had become apparent that the cost of construction of the observatory itself would be prohibitive if the building were to be built in the usual fashion, so Mr. Dyer and I began calling on some of our friends. We were successful in obtaining all the sand and gravel, the bricks, the reinforcing steel, the electrical materials and their installation, all the hardware, form lumber, tile pipe, steel sash, glass and glazing. The mixing and delivery of concrete, four carloads of slag from Birmingham, Ala., for the concrete blocks, the construction of the blocks themselves, the trucking of the sand and gravel, and a large septic tank were all procured without cost. Jack Lee, of the Rock City Construction Co., agreed to do the general contracting for the project without any charge for overhead, but he insisted on a profit to his company of one dollar! Mr. Dyer and the Nashville Bridge Co. contributed the 24-foot revolving dome of ¼-inch steel plate for the telescope and the 22-foot steel planetarium dome in the auditorium.

The co-operation of the people of Nashville was heartwarming. Shortly after a radio talk on my favorite subject, a telephone call came from a man I had never met. "Do you have your plumbing fixtures?" he wanted to know. I said we didn't. He told me to come down the next day and he would give me all the necessary fixtures. With these in hand, figuratively speaking, I next went to a plumbing contractor, who agreed to install all the fixtures without charge. The whole project snowballed in this fashion. My catch phrase to prospective contributors became, "I know you won't want to be left out of this project." My wife warned me that someday someone might say, "Oh, yes I do." But no one ever did.

One unusual gift was that of a 50-foot hole in the ground presented by a well digger as the start of a 200-foot well. Unfortunately neither water nor oil was struck, and rain water is now caught on the roof area of the observatory, filtered, and stored in a 28,000-gallon cistern.

The mounting of the telescope was constructed by the J. W. Fecker Co., of Pittsburgh. The instrument itself consists of a combination 24-inch reflector and wide-angle Schmidt-type camera. In this latter form, the telescope will be of a new design invented by Dr. James G. Baker, research associate of the Harvard Observatory.



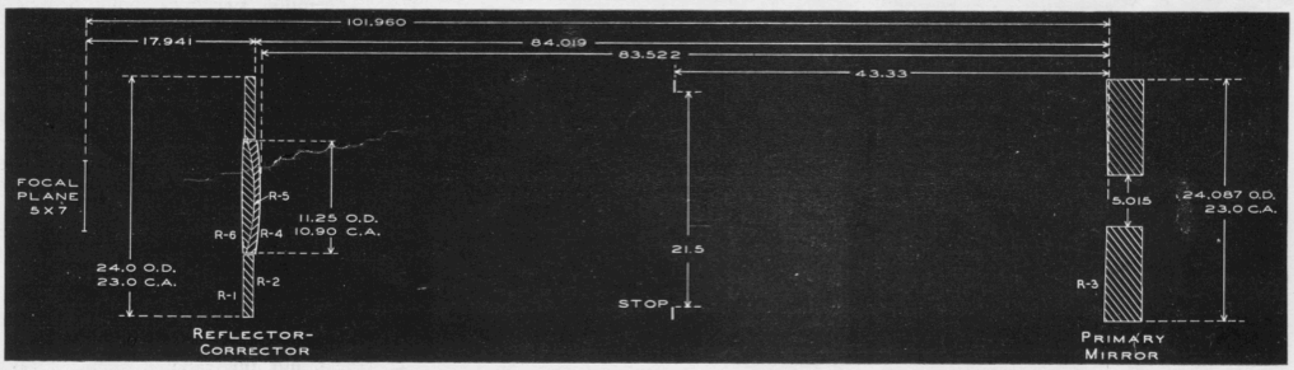
The road leading from the main highway to the Arthur J. Dyer Observatory.

The Baker reflector-corrector, as it is called, consists of an annular correcting plate with a low-power lens centered in the annulus and placed at about the position normally occupied by the Cassegrain secondary in a conventional reflector. Thus the starlight, after passing through the annular correcting plate, is reflected from the mirror back through the central lens to a focus at the center of the uppermost end of the tube. The photographic plate is placed at this point. The reflector-corrector lens transforms the narrow-angle reflecting telescope into a fast wide-angle, flat-field instrument.

Since this new telescope uses a parabolic primary, rather than a spherical mirror as in the case of the Schmidt telescope, it is possible to convert to a conventional reflector by replacing the reflector-corrector with one of the usual secondaries. Thus the telescope will have three possible focal lengths: seven feet (reflector-corrector), nine feet (Newtonian), and 33 feet (Cassegrainian). This convertible feature and the advantages of wide field, flat focal plane, and short tube length, make the Baker reflector-corrector telescope a unique and extremely versatile instrument.

During the dark of the moon, the telescope will be used with the reflector-corrector to photograph the Milky Way in a program designed to improve our knowledge of the structure of the galaxy. During the bright of the moon, when the fast-camera feature is least useful, the reflector-corrector will be removed, a Cassegrain secondary put in its place, and a photoelectric cell attached at the lower end of the tube. With this arrangement, studies will be made of the precise light variation of eclipsing stars for the determination of masses, diameters, and densities of these double systems. This latter work will extend an investigation conducted by the writer earlier with a 12-inch telescope built by John and Ward DeWitt, of Nashville.

Vanderbilt University furnished the funds necessary for the mounting of the telescope, and the Research Corporation of New York made a grant of $10,000 available for the optics. The Corning Glass Works donated a 24-inch blank of optical glass for an objective prism. Requests for estimates on the optics were sent to various concerns. Perkin-Elmer Corp., Norwalk, Conn., submitted an



REFLECTOR-CORRECTOR ARRANGEMENT OF THE DYER OBSERVATORY TELESCOPE

In this scale drawing all dimensions are given in inches, and the abbreviations O. D. and C. A. mean outside diameter and clear aperture, respectively. The primary mirror is a paraboloid, with a vertex radius of curvature (R-3) 214.50 inches and focal length 107.25 inches. However, the effective focal length of the telescope in this combination is 81.801 inches, with optimum correction at 4341 angstroms. The diagonal of the plate is six degrees. The focal plane can be moved an inch either way for focusing. The stop is used for photographic purposes only. The surfaces of the corrector have the following radii (in inches): R-1, infinite; R-2, aspheric (figured in parallel light to give a flat cutoff); R-4, 39.00 ±.030; R-5, 20.71 ±.030; R-6, 228.3 ±.30. Surfaces R-1 and R-2 are on 523586 glass; R-4-5, on 617366 glass; and R-5-6, on 517645 glass. Their thicknesses are R-1-2, 0.90 ±.10; R-4-5, 0.49 ±.02 (at vertex); and R-5-6, 1.062 (at vertex). When the telescope is used as a Newtonian or Cassegrainian, the corrector plate is swung out of the way and replaced by a secondary mirror. The first article in "Amateur Telescope Making — Book 3," edited by Albert G. Ingalls, is by Dr. James G. Baker, who describes there the advantages of this reflector-corrector design.

The director's residence on the grounds of the Dyer Observatory.

estimate of $15,000. When informed that our funds were not sufficient, Richard Perkin, the head of the company, sent Vanderbilt University a check for $5,000, which added to the $10,000 grant from the Research Corporation, enabled us to have Perkin-Elmer construct the optics.

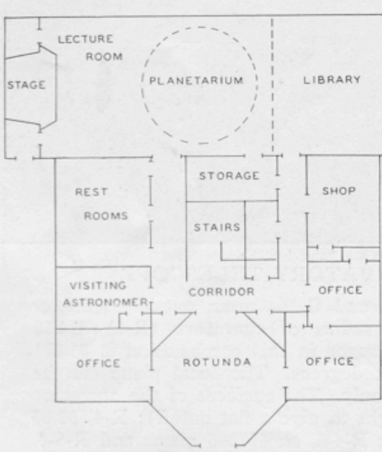
Of course, it takes more than bricks and plumbing to build an observatory. The necessary funds to purchase the materials that could not be obtained as gifts and to pay for the actual labor of construction were contributed jointly by Mr. Dyer and Vanderbilt University. Finally, a grant of $12,000 from the National Science Foundation assured the success of the whole project, the total valuation of which is in excess of a quarter of a million dollars.

At the end of March, 1952, after six years of planning, hoping, and struggling, the actual construction of the only graduate research observatory south of the Ohio River from eastern Virginia to western Texas was begun. During most of the construction my family and I lived in our house trailer on the site. As the observatory neared completion and the cold weather approached we scarcely waited for the building to be roofed over before moving into it, while construction was begun on the residence. In the meantime the historic Barnard Observatory had been torn down to make way for a new university dining hall, and the bricks were used in the construction of the residence.

The observatory houses, in addition to three offices, a visiting astronomer's apartment, a shop, an air-conditioned darkroom adjoining the observing dome, a 70- by 24-foot auditorium which is a combination lecture hall, library, and planetarium. The planetarium consists of a 22-foot steel hemisphere, the lowest four feet of which can be raised or lowered; when the room is used as an auditorium the dome is raised to ceiling height. The planetarium instrument was constructed in the shops of the Vanderbilt school of engineering. The research library, which can be closed off from the rest of the auditorium by an accordion door, contains a fine collection of astronomical publications. The publications of the Arthur J. Dyer Observatory have already begun. Reprints Nos. 1 and 2 have been distributed.

The new observatory will be open to the public at regular intervals for popular lectures, planetarium shows, and observations through the telescope. It is hoped that many astronomers will avail themselves of the visiting astronomer's apartment.

The dedication of the observatory and its telescope is scheduled for December 27, 1953. Representatives of the 80 firms and foundations which donated more than $200,000 in services, materials, and money, have been invited to be present when Mr. Dyer, representing the original contributors, presents the observatory to Vanderbilt University. The three days following the dedication are being devoted to the annual winter meeting of the American Astronomical Society.



The layout of the lower floor of the observatory. The observing chamber and darkroom are on the second floor.

LETTERS

Sir:

I have been asked by several professional and amateur astronomers to comment on the star list published by Comdr. Edwin A. Beito, of the U. S. Naval Academy, in the March, 1953, number of **Navigation,** which is referred to by Dr. Dorrit Hoffleit in the August News Notes of **Sky and Telescope.** This list contains proper names and the Bayer designations of the 57 selected stars of the **Nautical Almanac** and **Air Almanac.** Several changes in spelling have been made, such as Betelgeuse for Betelgeux, which help to make the list more nearly correct and more acceptable. Other names, however, have been gratuitously coined, and still others have been wrongly assigned to the stars.

There is a great and, in most cases, a very ancient tradition behind star names, which can be appreciated by anyone who will give a little thought and study to the subject. The amateur takes a certain amount of pride in being able to call the stars by their proper names, and the professional astronomer writes his learned and technical papers on Pleione, Arcturus, Algol, and Procyon. Several star names, such as Acrux and Miaplacidus, were fabricated over a century ago, and may well remain on our lists. But I sincerely and strenuously object to anyone taking upon himself the authority to begin a new era of star naming. Let us use the names that have come down to us through the centuries and be content with them.

Without further discussion, I recommend the following:

1. The following names should be deleted because they are simply meaningless fabrications: **Ankaa** for α Phoenicis, **Avior** for ε Carinae, **Gacrux** for γ Crucis, **Menkent** for θ Centauri, and **Atria** for α Trianguli Australis.
2. **Suhail** for λ Velorum should be deleted because it is the Arabic name of Canopus, and, without a modifying adjective, is not the name of any other star.
3. **Peacock** for α Pavonis should be deleted because it is the translation into English of the name of a modern **constellation,** not the name of a star.
4. **Al Na'ir** for α Gruis should be deleted because alone it is not the name of any specific star. In Arabic it simply means "the bright one."
5. **Hadari** (not **Hadar**) for β Centauri should be retained because it is one of the most ancient Arabic star names. It is pronounced **Hah-dah-ree,** with the accent on the second syllable. I have submitted an article on this star name to **Sky and Telescope,** in which I show that the name is an imperative verb and not a noun.

GEORGE A. DAVIS, JR.
800 M & T Bldg.
Buffalo 2, N. Y.