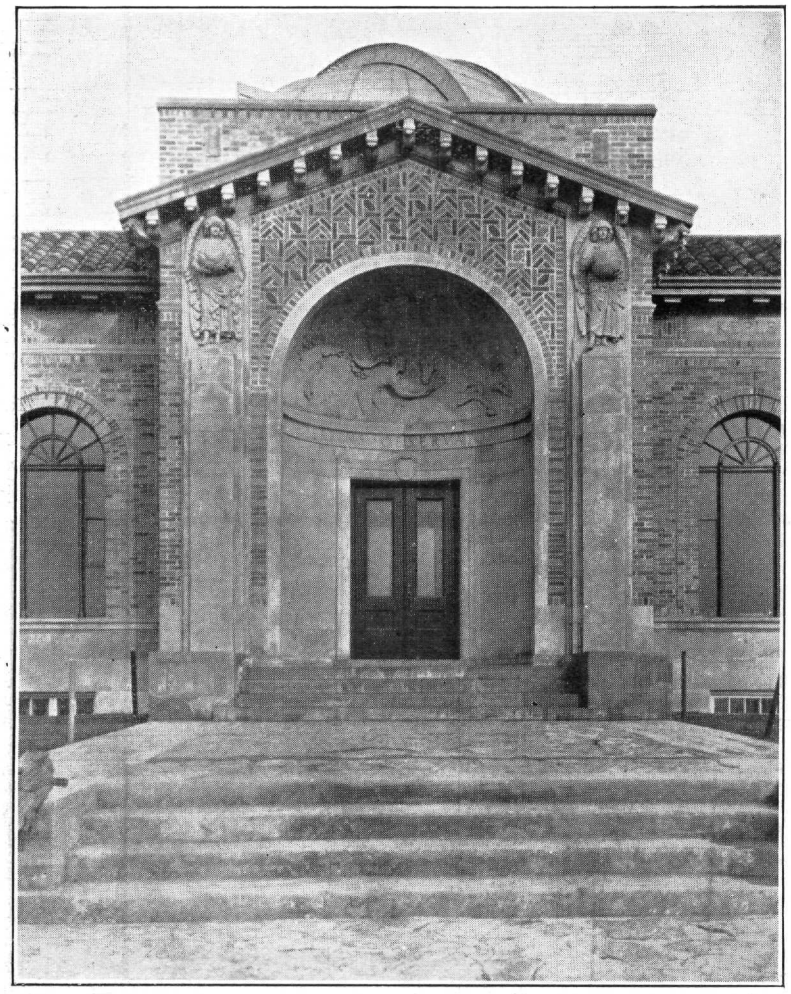
THE PERKINS OBSERVATORY

By FRANK DICKERSON, JR., '27

JUST south of Stratford on the Columbus-Marion road, and less than four miles from Delaware, is the new Perkins Observatory. The location is ideal and was well chosen. The beauty of the spot arouses interest immediately; but to the casual observer this is all. Although beauty was indispensable it was secondary to three other conditions necessary to make a truly successful observatory. On looking over the location one finds that there is no harmful vibration near, no powerful artificial light close by, no clouds of smoke to interfere.

The building was designed by Talmadge & Watson, Chicago architects. The construction of the building was started on November 1, 1923, by E. Elford, Contractor and Engineer, of Columbus, Ohio, and completed on September 1, 1924. The telescope was manufactured by the Warner & Swasey Company, of Cleveland, Ohio. There were many other companies that took part in constructing and equipping this fine building, but they are too numerous to mention here.

The building is in an Italian Renaissance style, with arched windows, red tile roof and wall decorations, and many shades of brown bricks. Under the jutting roof is a series of panels, alternating large and small, extending around the building. Carved in the larger panels are names that have come down to us through the ages as leaders in astronomy. The smaller panels contain relief carvings of the signs of the Zodiac. The entrance motive projects from the rest of the building and is a large niche with a door in the rear. On either side is a guardian angel holding a sphere in a gentle but firm embrace. Over the door-way is the legend of Apollo watering the horses, beautifully executed in stone. Just inside the door is the exquisite Memorial Hall with its quite unique starred ceiling. On the north wall is a bronze tablet with the profiles, in relief, of the donors. On either side is a door leading to a well-lighted, capacious class room. Directly across the hall from the bronze plaque is a large doorway leading into a most pleasing library. At the end of this hall is a large, curving stairway. The stair ascends a short way and then separates into two stairs, one curving up and to the right, the other to the left. The remainder of the first floor is used for offices. On the second floor there is a small outdoor room for observing the skies during the night classes. The circular telescope room, "the dome", is entered from the second flool level through a heavy steel fireproof door.



Entrance to The Perkins Observatory

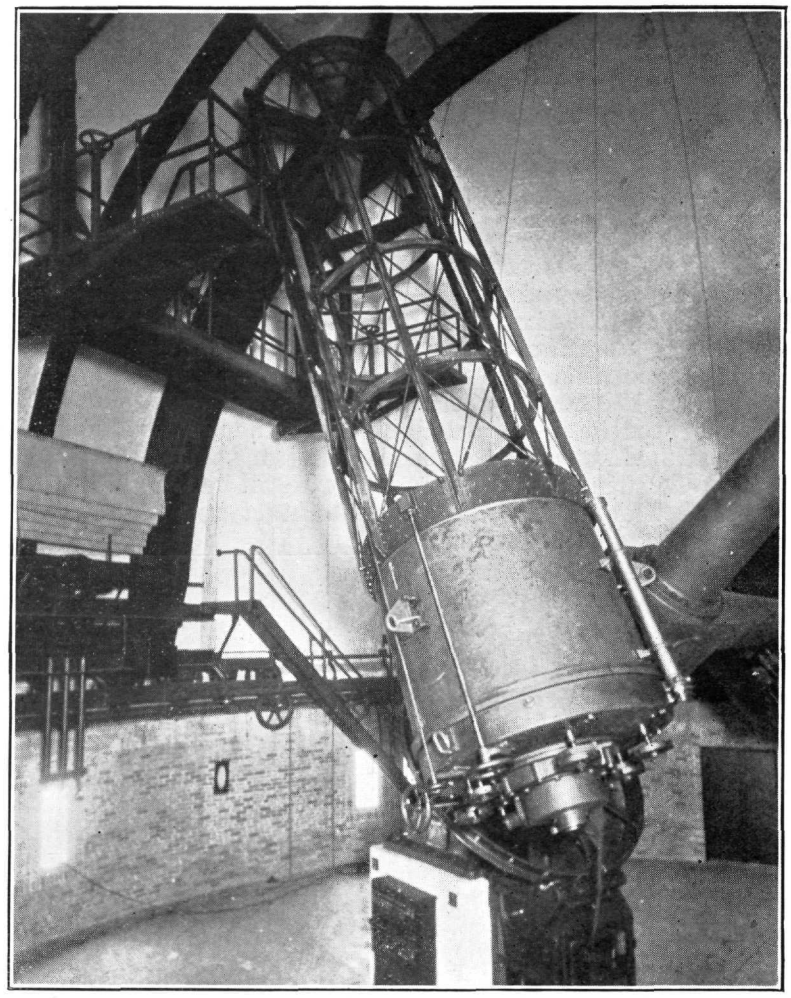
There are two types of telescopes in use at present in modern observatories; they are the refractor and the reflector. Of the two the reflector is being generally accepted as the better. In the reflecting telescope, there is no loss by absorption of the shorter wave lengths of light and no chromatic aberration. The two fields that occupy the leading places in the study of the prominent problems in astronomy are photography and spectroscopic work; and the reflecting telescope is the best suited for this work. The new Perkins Observatory has a 61-inch reflector.

The foundation for the telescope extends down to rock, which is about twenty-one feet below the surface at this point. It was absolutely necessary to have a firm, solid footing, for should there be any settlement, it would throw the finely adjusted instrument out of line. "The mounting is very similar to that of the Ann Arbor and Victoria reflectors. The telescope was designed and manufactured by the Warner & Swasey Company, under the direct supervision of Mr. E. P. Burrell. The tube of the instrument is of skeleton construction which is twenty-five feet in length. It is made of three main sections; the central section is a heavy ribbed cylindrical casting of 6700 pounds in weight which contains on one side, the seat for the declination axis; the lower section or the mirror cell, which contains the mir-

ror and its supporting mechanism; and the tube which is of skeleton construction, made of T-bars firmly united together and stiffened with tie rods and turn buckles. The tie rods provide great rigidity no matter in what position the telescope is placed; and tests have proven that the maximum deflection of the tube is well within the limits of the optical requirements. At the upper end of the tube are four radial webbs which carry a support for the secondary mirror which may be a 'flat' of 17½ inches in diameter for observing at the Newtonian focus or a convex mirror of 16 inches in diameter for observing at the Cassegrain focus. These mirrors can readily be removed and when neither mirror is in place, observations can be made at the prime focus. The weight of the tube and the moving parts of the instrument is approximately 30 tons." The stationary parts weigh an additional 10 tons.

"The instrument is rotated in an east-west direction by means of a polar axis, which is made of three heavy steel castings securely bolted together. The center section is a hollow cube measuring three feet on each edge, through which the declination axis passes. The upper and lower sections of the axis are slightly conical in shape and have, at their smaller ends, forged steel extensions upon which are mounted self-aligning radial ball bearings. These bearings are housed in heavy casings called the pier-heads which support the great weight of the instrument. The polar axis is mounted exactly parallel to the earth's axis. At right angles to this axis is the declination axis, a massive steel shaft bolted to a seat in the center piece of the tube. This axis rotates in ball bearings and enables the instrument to be rotated in a north and south direction. The power for moving the instrument in these coordinates is furnished by an electric motor which is located in the large housing at the outer end of the declination axis. This housing not only supports the mechanism that provides motion in a north and south direction, but it serves to counter-balance the weight of the telescope tube on the opposite side of the polar axis."

One of the most important features of the telescope is the driving clock. This is the mechanism that turns the telescope backward at the same rate at which the earth is moving forward, thereby keeping the telescope in alignment with the star all evening. "The main driving worm is mounted directly on top of the clock housing and is driven at the rate of one revolution every two minutes. This worm meshes with a very accurately cut bronze wormwheel, mounted on ball bearings at the lower end of the polar axis. Automatic winding of the clock is accomplished by a separate electric motor. Besides the motor used for winding the clock, only three others are used to run the remainder of the mechanism. All operating apparatus have been eliminated from the north and south pier heads. With this last improvement and a few other minor ones gives Ohio Wesleyan not only the third largest instrument of this kind but one that is superior to its predecessors."



The Telescope Mounting

The dome itself is an interesting feature. It is constructed on wheels, which run on a track built on top of the walls of the circular room. With this arrangement the dome can be turned through an angle of 360 deg. The opening in the dome is about eight feet wide and extends from an apeak tangent on the side to a horizontal tangent on the top. This aperture is covered by movable shutters which separate in the middle, extending the long way, one sliding to the left and the other to the right. This orifice in the dome can be covered with strong curtains, when it is deemed necessary, leaving just enough room for light rays from the stars to enter the telescope.

At the lower end of this opening is a movable bridge. It is about ten feet from the floor and is accessible by means of a slightly curved narrow iron stairway. This bridge accommodates six to eight observers. When it is loaded, a lever is turned and the bridge moves upward on tracks along the inner side of the dome. When it reaches the top of the telescope it is halted, for one must look into a small telescope apparatus near the top of the telescope tube. When the observations have been made, the bridge is lowered to its original position.

*From "The Ohio Wesleyan Magazine."

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When one steps into the room with that gigantic telescope a mysterious, awed sensation creeps up one's spine. You cannot explain it and you carry it away with you.

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