

FIRST PHOTOGRAPH

The moon was first to pose before the new 82-inch diameter mirror of McDonald Observatory. Seldom will the new telescope be aimed at such near-by objects. Extremely faint stars and great gas clouds will be investigated.

ASTRONOMY

Texas' New Telescope Giant Goes Into Action In May

Great Glass Mirror, Nearly Seven Feet Across, Will Search for New Dwarf Stars and Clouds of Glowing Gas

See Front Cover

UPON a mountain top in Texas, science has a new looking glass for the heavens. It is the second largest telescope in the world, and the most perfect.

The great glass mirror of McDonald Observatory is nearly seven feet across, 82 inches in diameter. Its shiny coating of aluminum is laid on an arduously and patiently fashioned glass surface accurate to a millionth of an inch.

Astronomers expect great discoveries from this precise tool for exploration of the universe, this \$800,000 investment that will pay dividends in scientific knowledge.

Watch for these discoveries!

New white-hot, dwarf stars so compressed that they are as tiny as our earth, with each cubic inch weighing several tons.

New clouds of glowing gas in the universe, remains of disintegrated stars and planets.

Mt. Locke towers nearly 6,900 feet in the Davis Mountains resort region of

western Texas. McDonald Observatory's great dome perches upon it, tall as a five story building, shiny, electrically operated, center of a little scientific colony, 45 miles remote from the railroad and 16 miles from the closest village.

Two great universities cooperate to operate this outpost of astronomy. With a bequest from a Paris, Texas, banker, William J. McDonald, the University of Texas paid for the observatory. The University of Chicago, long parent to famous Yerkes Observatory at Williams Bay, Wis., joins in its operation. For nearly six years, the Warner & Swasey Company of Cleveland, builder of precision machine tools and telescopes, has been designing and constructing the telescope and observatory, fashioning the mirror from a great glass disk poured at Corning, N. Y.

Finally on May 5, in the presence of a notable gathering of American and foreign astronomers, the new observatory will be dedicated. The completed observatory is pictured on the front cover

of this week's SCIENCE NEWS LETTER.

Already the great glass has been swung into action under the guidance of Dr. Otto Struve, director of McDonald and Yerkes Observatories. It is living up to the hopes of the astronomers.

Only One Larger

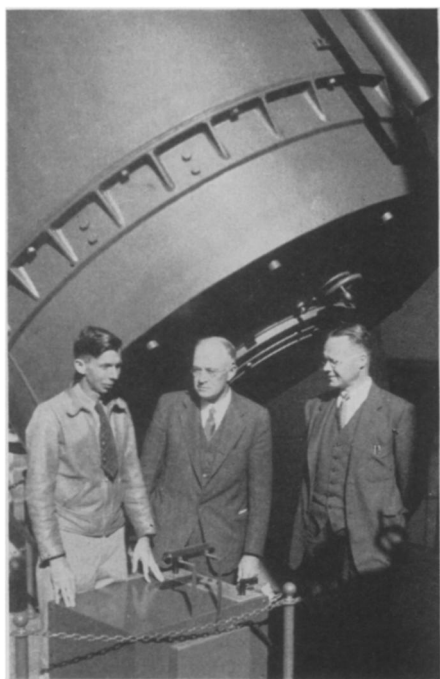
Only the 100-inch telescope, in operation for two decades on Mt. Wilson, Calif., now exceeds in size the McDonald telescope. Both these telescopes will be topped in size by the 200-inch reflector for Mt. Palomar, Calif., when it is completed, probably next year. But such heavy astronomical artillery is too precious to be used competitively. Each of these great telescopes has its own tasks. The operating astronomers cooperate in making their plans so that their precious observing hours are not wasted in duplication.

If a man could fly 3,000 miles out in space, the McDonald mirror could still pick up his image. So powerful is it that photographs can be taken of stars which are a million times fainter than the faintest seen with the unaided eye. Some of these stars are so distant that it takes light 400,000,000 years to travel from them to earth.

The observatory itself is a three-story cylindrical house, surmounted by a 62-foot diameter hemispherical dome containing the telescope itself. The telescope is 26 feet long and weighs 75 tons, including the three-ton mirror. But so carefully poised is the instrument that a one-third horsepower motor drives it accurately to a hair's breadth. The dome weighs 115 tons and the telescope is sighted at the heavens through an 18-foot wide slot.

Dr. Struve, director of McDonald and Yerkes Observatories, comes of an astronomical family, his father, grandfather and great-grandfather having been world-famous astronomers in Russia under the Czars. Dr. C. T. Elvey is second in command at McDonald Observatory. Other McDonald-Yerkes astronomers who will use the new telescope are: Dr. George Van Biesbroeck, famous for comet observations; Dr. G. P. Kuiper, who specializes on extra-heavy dwarf stars; Prof. W. W. Morgan, authority on star spectra; Prof. S. Chandrasekhar, who specializes on the constitution of stars, and Prof. Karl E. Seyfert. Prof. Chandrasekhar is an East Indian, and his name is appropriate to an astronomer since it means "the man who carries the moon." He happens to be a nephew of Nobelist C. V. Raman.

Most of the large telescopes are of the



THE MIRROR END

Near the electric control of McDonald Observatory's great 82-inch telescope are Dr. Otto Struve, director (right), Dr. H. G. Gale, head of the University of Chicago's physics department (center) and Dr. C. T. Elvey, second in command (left).

reflecting or mirror type like that of McDonald Observatory. Among these large reflecting telescopes smaller than McDonald's 82-inch are: Dunlop Observatory's 74-inch near Toronto, Dominion Observatory's 72-inch at Victoria, British Columbia; Ohio Wesleyan's 69-inch at Delaware, Ohio; Harvard's 61-inch at Oak Ridge, Mass.; Harvard's 60-inch in South Africa. The largest of the refracting or lens telescopes is at McDonald's older sister institution, Yerkes Observatory, Williams Bay, Wis., which has a 40-inch instrument.

Science News Letter, April 29, 1939

Adding calcium salts to tomatoes is found effective in keeping the tomatoes firm and whole in canning.

● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the Jesuit Seismological Association resulted in the location of the following preliminary epicenter:
Tuesday, April 18, 1:22.7 a. m., EST

On coast of Chile, near the town of Copiapo. Latitude 27 degrees south, longitude 71 degrees west.

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL August 13.

BIOLOGY

Sex Determination In Rats Achieved Through Diet

When Fathers Eat Lots of Protein and Mammals Eat None, The Babies Born Include Larger Proportion of Males

IF MEN were rats, Papas wanting sons might be advised to eat all the beefsteaks and other protein foods at the family dinner table, leaving only a small bit for the mammas.

This sort of diet—high protein for the papas and low protein for the mammas—when fed to rats resulted in a sex ratio of 145 males to 100 females in the offspring, Drs. F. Hoelzel, Esther Da Costa and Prof. A. J. Carlson of the University of Chicago have just announced.

When the diets of the same rats were reversed, giving the mammas more protein than the papas, the sex ratio in the offspring was reversed to 92 males to 100 females.

"This is a striking decrease in the male ratio as the normal seasonal (spring) effect is an increase in the male ratio," the Chicago scientists comment in reporting their findings to the Society for Experimental Biology and Medicine.

"It is too early to say whether diet could be used to practical advantage to control sex in animal breeding," Dr. Hoelzel replied to a Science Service inquiry.

"Our results however may mean that the greater number of boy babies, particularly after some wars, are due to the fathers obtaining a higher proportion of protein in the diet than the mothers.

"The most significant suggestion from our results seems to be that the 30 to 40 per cent. of abortions or resorptions of fetuses that are known to occur in domestic animals and humans may be serving an important role in evolution by eliminating the least fit at this early stage of life."

The theory that the better nourished parent tends to determine the same sex in the offspring was proposed many years ago. These studies seem to confirm the theory.

The explanation given by the Chicago scientists is that the state of protein metabolism induced in the parent evidently also affects the germ cells and tends to determine the survival value of the same sex among the embryos.

"The survival of a larger percentage

representing the better nourished sex might be due to the expected transmission of sex-linked characteristics. The results would also be explained if mammalian reproduction is a modification of parthenogenesis in which each sex tends to reproduce itself with survival of the fittest."

Science News Letter, April 29, 1939

PHYSICS

Magicians' Trick Puts Glasses on Museum Guests

AN OLD-TIME but still mystifying trick of magicians is being used to "fit" visitors with spectacles in a new exhibit at the New York Museum of Science and Industry.

In its new Hall of Optical Science, prepared especially for the World's Fair visitor, one looks into the exhibit and sees his face reflected apparently from a regular mirror. But across the bridge of his nose is superimposed any one of six pairs of spectacle frames from the old-fashioned kind of Ben Franklin's epoch to the modern streamlined style.

It's done with a mirror which is only half-silvered and semi-transparent.

Behind it is a revolving drum on which are mounted six different kinds of spectacle frames. The visitor looks at the mirror, sees the reflection of his face and at the same time sees a pair of spectacles behind the mirror so aligned that the spectacles appear to be on the observer's nose.

The spectacles can be "changed" by turning a knob.

The new exhibit, showing also basic principles of optical science and the manufacture of optical parts, were first displayed at a special luncheon (April 20) honoring the 25th anniversary of William Bausch's first experiments in making optical glass in what is now the Bausch and Lomb Optical Company plant.

Science News Letter, April 29, 1939

Far from being simple H₂O, ordinary water contains 33 substances, an engineer points out.