

ASTRONOMY

New "Farthest Out" Set At Three Sextillion Miles

**Tiny Nebula, Photographed With 100-Inch Telescope,
Using Ultra-Fast Plate, Required 3½-Hour Exposure**

ASTRONOMY'S "farthest out," a faint nebular "universe" of stars three sextillion miles (3,000,000,000,000,000,000,000 miles) from earth, has been sighted by the famous 100-inch world's largest telescope of the Carnegie Institution's Mt. Wilson Observatory.

Using a new, experimental photographic plate, the Mt. Wilson Observatory astronomers have thus extended the observational limits of the 100-inch telescope approximately a third as far again as the previous record.

The nebula just discovered, whose estimated distance is 500,000,000 light-years, to use the yardstick of the astronomers, is traveling through space outward at the amazing rate of 50,000 miles per second, which is more than a quarter of the 186,000 miles per second speed of light, fastest speed in the universe.

Dr. Edwin P. Hubble, veteran discoverer of nebulae and discoverer of the relation between nebular speed of recession and distance from earth, explained that this velocity is based on the assumption that the relationship between speed and distance holds true in the extreme outer reaches of the universe now probed by the giant Mt. Wilson telescope.

To capture the image of the nebula, the faintest object recorded, required a 3½-hour exposure. The photographic plate used was about twice as fast as those ordinarily employed to photograph faint objects. The most distant nebula appears as a minute spot.

The recessional speed of distant nebulae is based on the shift of the lines in their light spectrum toward the red, the so-called "red-shift." This displacement of lines has been interpreted as being caused by an actual rushing away of the nebulae. And the more distant the nebulae, the greater the red-shift and the speed of recession. This has been demonstrated by Dr. Hubble observationally and it also follows from the Einstein theory of relativity. The fact that the farthest out

portions of the universe are rushing away fastest gave rise to the idea that the whole universe is expanding at a tremendous rate.

Just last December the scientific world was told that Dr. Hubble has found a nebula with a recession of 24,500 miles per second, indicating a distance of 245,000,000 light-years. The new discovery just about doubles this record.

A light-year is the distance light travels in a year, about six trillion miles.

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ETHNOLOGY

Ancient Navajo Language Now to Be Written

AYALE professor, a scientist-priest, and a Navajo Indian are working together on a book.

It is to be a handbook, to aid the Office of Indian Affairs in its project to teach Navajo Indians to read and write their own language.

Thus, the Government forges ahead on an experiment which has extraordinary aspects.

The Navajo tribal language, spoken for centuries, kept alive even with pressure of English and Spanish around it, is entering upon a new estate. It is to become a language that can be read and written by its people.

Never before have Navajo Indians been able to see their "literature" in native print. Now, the biggest tribe in the United States, 42,000 strong on its reservation in New Mexico and Arizona, is to become bilingual in all-round fashion. The children are to take reading and writing lessons at school in two languages, English and Navajo. The Government will send its communications in both languages, so that any Navajo can see for himself what the Government has to say, or can have it read straight to him in his own language. Since many Navajos speak no English, they have had to depend on

interpreters in the past to explain the words of the Government.

An institute for interpreters is being held during January and February on the reservation, to bring the Navajo language up to date, so to speak. With Navajos busy with soil erosion projects, health programs, and education plans, interpreters who explain it all to Navajo-speaking Indians have a hard time. At the institute, specialists doing technical work on the reservation will help the interpreters to find the best Indian terms for modern projects.

The afore-mentioned handbook, being prepared by Prof. E. Sapir of Yale University, assisted by Father Berard Haile of Gallup, N. M., and Albert Sandoval, a member of the Navajo tribal council, is intended as a basis for teaching Navajo to Indian service workers in the field.

Navajo was studied and reduced to writing some years ago, for scientists only to read—most people would have said. Now, that scholarly study which seemed of interest to a small, select group only, has become the foundation for giving an Indian tribe a new cultural asset.

Science News Letter, February 9, 1935

PUBLIC HEALTH

Find Thousands of Germs On "Clean" Glasses

THOUSANDS of bacteria on the rims of supposedly clean, germ-free drinking glasses—as many as 50,000 to 100,000 bacteria on a single glass—were discovered by Prof. W. L. Mallmann and E. D. Devereux, research associate, of the Michigan State College.

These bacteriologists have been investigating the sanitary condition of glasses at roadhouses, taverns, and saloons in cooperation with the Lansing department of health.

"The possible role of eating utensils as a factor in the transmission of disease has been demonstrated from time to time over a period of years," they said in explaining their scientific report made to the Society of American Bacteriologists.

Tableware has been shown to be a carrier of the organisms causing diphtheria, pneumonia and tuberculosis and of two kinds of dangerous streptococcus "germs," they pointed out.

"Since the repeal of prohibition there have sprung up numerous road houses, taverns and saloons for the dispensing