ASTROPHYSICS

New Method Gives Size Of Smallest Quasars

➤ THE SMALLEST quasar—one of the brightest sources of radio and light radiation in the heavens—has been measured for size using a new method involving variations in the solar wind, the continuous stream of gas thrown spaceward by the sun.

The method showed that 3C-273 is only 34 parsecs in diameter, or only 653 million million miles across, relatively small for a source that radiates as much energy as an entire galaxy of billions of stars.

The quasar may even be much smaller than the measurement, which gave only an upper size, according to a report in Science, 153:745, 1966, by six scientists from Cornell University, Ithaca, N.Y. Dr. E. A. Salpeter and his five co-workers state that their method of determining angular size from scintillation studies gives the most accurate results yet obtained for diameters of radio sources.

MEDICINE

Scientists Volunteer For 186 Mosquito Bites

➤ TO PROVE that a type of malaria can be transmitted from man to monkey to man, two scientists at the Gorgas Memorial Laboratory, Balboa Heights, Canal Zone, let themselves be bitten by 186 mosquitoes. The scientists' blood containing vivax malaria from some of the mosquitoes was transmitted successfully for what is believed to be the first time to night monkeys.

The mosquitoes were *Anopheles albimanus*, one of the chief malaria-carrying Anopheles species of the world, and the full scientific name of the human malaria is *Plasmodium vivax*. The night monkeys used are *Aotus trivirgatus*.

Two night monkeys were first inoculated with blood drawn from a malaria patient living in Santa Rosa, a village on the Chagres River. The monkeys had had their spleens removed and at the time of inoculation they received by mouth an immunosuppressant drug, Imuran. The patient's blood had been treated with heparin to prevent coagulation before it was inoculated into the animals.

Before inoculation with human parasites the blood of the monkeys was examined repeatedly to rule out the possibility of a natural infection with malaria, although natural infections have never been reported from night monkeys.

These *Anopheles albimanus* mosquitoes, which have been in a colony at Gorgas for many years, were fed on one of the night monkeys that had previously been infected with parasites from the Santa Rosa patient. These mosquitoes then bit each of the two volunteers.

The only other animal reported to be susceptible to *P. vivax* is the chimpanzee *Pan satyrus*. The researchers said that current work at Gorgas Memorial Laboratory indicates that night monkeys may become useful hosts for the study of human malaria.

Reporting the experiment in Science, 153:1006, 1966, were the two volunteers, James A. Porter Jr., and Carl M. Johnson, with Martin D. Young.

SPACE

Space Age Product May Pave Roads

➤ SPACE AGE research is leading to progress on earth. In the future roads may be paved, swimming pools lined and houses roofed with a new thermoplastic rubber that is the by-product of a search for a powerful rocket fuel.

The new compound, a mixture of asphalt, oil and ordinary plastic, has a rubbery consistency and is more resilient and durable than asphalt alone.

It apparently can withstand Alaska's cold and California's heat for it was not damaged by laboratory temperatures ranging from 100 degrees below to 180 degrees above zero Fahrenheit.

Samples tested for over a year also seem to be resistant to smog which cracks most rubbers. It would also be less likely to be split by earthquakes than asphalt or concrete.

Dr. Frank J. Hendel of the California Institute of Technology invented this remarkable rubber which he envisions some day being rolled out on a highway like a carpet.

In the immediate future, however, it could be used to mend cracks in asphalt or concrete roads. By laying down a half-inch-thick carpet of thermoplastic rubber over the cracked surface of a highway, complete or partial replacement of the surface might be unnecessary.

The one major handicap to mass production of thermoplastic rubber is expense. It costs 20 cents a pound, or $400 a ton, compared to $7.50 for the type of asphalt commonly used to pave streets and driveways.

Dr. Hendel discovered thermoplastic rubber when he was mixing polymers in experiments to find solid propellant fuel binders at Caltech's Jet Propulsion Laboratory for the National Space and Aeronautics Administration.

After testing about two dozen blends of the plastic-like chemicals, Dr. Hendel revived a 20-year-old solid-fuel experiment using asphalt. He added the usual oil as well as the new polyethylene and ended up with the tough, rubbery product when it all cooled.

Ironically, the far ranging applications of thermoplastic rubber do not include use in rocket fuels for which it was originally tested.

IN SCIENC

GENERAL SCIENCE

House Rules Committee Kills Metric System Study

➤ THE RULES Committee of the House of Representatives, on a seven-to-seven vote, again this year declined to send to the House a Senate-passed bill to study letting the United States join most of the rest of the world on the metric system.

By any measurement, that action on Aug. 25 killed the bill for this session of Congress. Rules Chairman Howard W. Smith (D.-Va.), who is 83 and has been accused by liberals of meting out progress in inches, said there was no prospect that the vote will be reconsidered.

In September 1965, the Committee merely "deferred action" on the measure. At that time, it promised Space Committee chairman George P. Miller (D-Calif.) another chance this year to explain why the U.S. ought to give up feet, gallons, pounds and degrees Fahrenheit in favor of meters, liters, grams and degrees Centigrade.

Congressman Miller believed the fact that Thomas Jefferson was the first to propose the U.S. measure metrically would clinch referral of the bill. However, this fact did not sway Rep. Smith. Thomas Jefferson is credited with adoption by the U.S. of a metric, or decimal system for money.

SOCIOLOGY

Increase in Marriages Due to Viet Nam Draft

➤ A TOTAL of 7.4% more marriages occurred in the United States during the second half of 1965 than in the corresponding period of 1964, reflecting concern about the Viet Nam draft.

The greatest rise occurred in July and August 1965, prior to the Executive Order of Aug. 26, which removed the special draft deferment rules for men who married after that date. In fact, July and August marriages were more numerous in 1965 than in any other year except 1946 when the aftermath of World War II precipitated an all time high.

In the United States there were about 1,802,000 marriages in 1965, compared with 1,724,000 the year before and 1,656,000 in 1963.

Georgia was the only state reporting fewer marriages in 1965 than 1964. This can be attributable to stricter marriage license laws, including proof of age of all applicants as well as parental presence and consent for those 19 years old or under.

E FIELDS

TOXICOLOGY

Chimps Seen as "Middle Men" in Drug Tests

➤ CHIMPANZEES could be the answer to the scientists' question of when to end animal tests and begin testing humans.

The U.S. Food and Drug Administration is studying the feasibility of "certifying" chimps for testing new drugs at an intermediate stage before clinical trials get underway and after traditional animal studies are finished.

The chimp theory is being tested on six animals, being given the drug chloramphenicol, by contract of the FDA with the Aerospace Medical Laboratory, Alamagordo, N. Mex.

"We intend to find out how the chimps react to chloramphenicol and to compare these reactions with those we are quite familiar with in man," FDA Commissioner Dr. James L. Goddard said.

"If, as we suspect, there will be a close correlation, then we can proceed to the next step, to 'certify' the chimp as a threshold subject for at least some of modern toxicology."

ASTROPHYSICS

Comet's Temperature Taken for First Time

➤ A COMET'S temperature has been taken for the first time. It heated up from 700 degrees F. when it was 45 million miles from the sun to 1,200 degrees when some 20 million miles from the sun.

As Comet Ikeya-Seki sped away from the sun, it cooled down to the same temperatures at the two distances. When the comet was within 20 million miles of the sun, solar radiation drowned out the infrared signals on which the temperature measurements were based. Its energy was too faint to be detected when it was more than 45 million miles from the sun.

Eric E. Becklin and James A. Westphal of California Institute of Technology made the infrared observations for 19 days starting Oct. 14, 1965, using the 24-inch telescope at Mt. Wilson Observatory, operated jointly by Caltech and Carnegie Institution of Washington.

Details on the infrared studies, which were supported by the National Aeronautics and Space Administration, are reported in the Astrophysical Journal, 145 : 445, 1966.

"The steady increase and decrease in temperature with distance from the sun strongly suggests that the temperature of the comet was entirely dependent upon the sun," Mr. Westphal said. "So does the fact that the nucleus, or head, and the tail had the same temperature."

The observations, he noted, make it difficult to believe that comets are composed mainly of chunks of ice and dirt, as some astronomers have suggested. However, there could have been a small amount of ice to "glue" the nucleus together.

Instead of a significant amount of dirt and gravel, the comet evidently consisted of large amounts of metallic material. Comet Ikeya-Seki probably lost tons of iron and other metallic substances into space as it whipped around the sun, skimming within 14 million miles of earth's life-giving star on Oct. 20, 1965.

The comet was an unusual one not only because it came so close to the sun but also because it had evidently done so at least once before.

PHYSIOLOGY

Eat Less To Be More Active

➤ EATING less means doing more, or so it seems. In nutrition experiments with rats, a scientist has found that animals on a restricted diet exercised more than those that were well fed.

The animals were given diets balanced much the same as those eaten by an average person in the United States. Cornstarch represented starchy bread and potatoes; beef tallow and corn oils equalled fats and oils. They also were fed a daily supplement of proteins, vitamins and minerals.

Some of the experimental animals were liberally fed. Others received only 60% as many calories, but both groups were given the same amounts of proteins, vitamins and minerals.

All of the rats were still growing. Those receiving small meals gained an average of 33 grams during the 31-day test period. Their well fed friends gained an average of 87 grams—two and a half times as much.

Rats are normally active at night and these two groups were no exception. All of them were up and about, using their exercise wheel freely.

During the day, however, the well-fed rats rested, while those on the restricted diet ran in the wheel almost as much as at night. They averaged 9,790 spins compared to only 5,870 by the less active.

The sleep patterns of the two groups were also somewhat different too. The active runners took naps around the clock instead of sleeping for long stretches during the daytime as the well fed group did.

Physiologist R. A. Ahrens of the Agricultural Research Service, Beltsville, Md., conducted the studies reported in Agricultural Research, September 1966.

MEDICINE

Auto Fatigue Causes False Appendicitis

➤ MANY an apparent case of appendicitis developing in an auto driver is due to fatigue in his stomach muscles, British doctors have discovered.

The basic trouble is wrong positioning of controls in some cars, so that the driver cannot straighten his knees. The driver is forced to move his legs, using his hip joints and stomach muscles instead of his ankles to control the pedals.

"Unfortunately," said Dr. Rhona E. Beswick, assistant medical officer, Welsh Regional Hospital Board, "this unsatisfactory placement of seat relative to pedals is found in many small cars."

It was also found in any car when an adjustable seat was not properly positioned and also occasionally in buses and trucks when the driving seat was fixed too near the pedals, so that the driver could not straighten his knees.

Another feature which leads to excessive hip action is the positioning of the accelerator and foot brake pedals at different distances from the driver. The leg movements necessary produce fatigue in the stomach muscles, especially on the right side.

"The resulting pain," Dr. Beswick, said, "may easily be attributed to a cause, most often appendicitis, other than the physical effort of driving." The condition is not uncommon, but is not often diagnosed.

PHARMACOLOGY

Long Acting Aspirin Given Short Life by FDA

➤ MEASURIN, the first timed-release aspirin tablet to be put on the market as an over-the-counter product, is expected to be withdrawn because of disapproval by the U.S. Food and Drug Administration.

Measurin went on the market last February but although the initial licensing was approved by FDA, the drug's effectiveness was first questioned last spring.

Data on clinical investigations by Cass Research Associates submitted by Chesebrough-Pond's Inc., were found by FDA's Bureau of Medicine to contain "irregularities . . . of sufficient magnitude that such studies are not adequate." Formal notice of withdrawal action was published in the Federal Register, Aug. 19.

The manufacturer was given 30 days to request a public hearing but FDA said it will refuse to approve pending supplements that propose changes in the original application because safety and effectiveness ar lacking.

Time-release drugs are often prescribed by doctors so a patient's sleep will not be interrupted.