ASTRONOMY

Three New White Dwarfs Weigh 3 Tons Per Inch

THREE more "white dwarf" stars, heavyweights of the heavens, have been found by Prof. Gerard P. Kuiper of the McDonald Observatory, raising the number known to 25. White dwarf stars are relatively close to earth and some of them weigh a million pounds per cubic inch.

The new white dwarfs are Wolf 1, Ross 548, and the faint star in what astronomers call Selected Area 26. They are all comparatively light weights, with densities of about 3 tons per cubic inch, which still is thousands of times the weight of earthly matter.

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ARCHAEOLOGY

Unearth Greek Home Of "Winged Victory"

EXCAVATING the sanctuary at Samothrace, where the famous "Winged Victory," now in the Louvre, once stood, archaeologists have learned more about mystery rites of ancient Greece.

A large hall was used for the dramatic performances and rites of initiation when new members were added to the religious cult of the Great Gods of Samothrace, Dr. K. Lehmann-Hartleben, of New York University, told the Archaeological Institute of America, meeting at Ann Arbor, Michigan. On two sides of the great hall were rows of wooden benches, possibly for ambassadors who came to the festival from many towns, and on the south side of the hall was a sloping platform for spectators.

Nearly in the center a round wood platform, still discernible in the burnt debris, marks the spot where the new members of the religious community were exhibited to the crowd. In the southeast corner, a round sacrificial structure was for pouring liquids into a pit under the open sky. After initiation, the new members entered a side chamber and a higher level, where they had a final revelation.

Pronouncing the sanctuary building unique in its type and installation, Dr. Lehmann-Hartleben said that it had a long life of about 900 years, since the structure dated from about 500 B.C. and the cult was still active in the fourth century A.D. The interior he described shows its appearance about 300 B.C.

The Victory statue, he said, stood on a platform framed by terrace walls, and overlooked the romantic valley of the sanctuary.

Great masses of architectural relics, sculptures, coins, and clay wares have made it necessary to start building a museum. The expedition of the Archaeological Research Fund of New York University was carried out under auspices of the American School of Classical Studies in Athens.

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GEOLOGY

Radium in Navajo Rugs; Dye Made from Carnotite

CARNOTITE, canary-yellow colored ore of radium, uranium, and vanadium, is one of the sources of the Indian weavers' black dye, says Dr. Daniel T. O'Connell, geologist of the College of the City of New York. (*Science,* Sept. 22)

Navajos roast yellow carnotite powder in a frying pan until it turns black, then mix with pitch roasted to powder. A third ingredient is a brew from the entire plant of the squaw-berry bush, which must be boiled to a tea-color. The dye is diluted with water.

A good many Navajo weavers now use coal tar dyes, Dr. O'Connell says. But some of the better modern rugs are dyed with the old-time natural dyes, which the Indians themselves concoct from local plant and mineral sources.

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PSYCHOLOGY

Sleep Quality Important For Good Spirits Next Day

YOU must sleep well if you are to be in high spirits the next day, Dr. Weston A. Bousfield, of the University of Connecticut, told the meeting of the American Association for the Advancement of Science in Columbus.

Quality as well as quantity of sleep is important in producing that sense of well-being known to psychologists as "euphoria," Dr. Bousfield has found. If you get six to six and three-quarters hours of slumber of high quality, you will have higher euphoria than if you had the recommended eight or even eight and three-quarter hours of low quality sleep.

Although Dr. Bousfield did not mention it, his results suggest that sleep disturbed by worry of air raid alarms or by a bad conscience does not lead to gay spirits on the morning after.

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IN SCIEN

PHYSIOLOGY

"Pep Pills" Fight Sleep Through Brain Respiration

SO-CALLED "pep pills" of benzedrine, resorted to, sometimes dangerously, by college students for wakefulness during cramming sessions, owe their sleepfighting effect to their influence on brain respiration, Drs. P. J. G. Mann and J. H. Quastel, of Cardiff City Mental Hospital, report. (*Nature,* Dec. 2.)

Benzedrine has "unquestioned value," the Cardiff doctors point out, in the treatment of narcolepsy, that strange condition in which the patient is seized, often at inconvenient and even dangerous times, with an uncontrollable desire to sleep. The condition is also known as paroxysmal sleep or sleep epilepsy.

Chemical studies by the Cardiff scientists suggest that benzedrine may fight this condition by retarding the formation of poisonous substances such as aldehydes which depress the respiration or oxygen uptake of the brain. Benzedrine does retard aldehyde formation, Drs. Mann and Quastel found. The next step will be to determine whether these or similar substances accumulate in the brains of patients with narcolepsy.

The Cardiff studies were made on brain tissue outside the body to which a chemical called tyramine was added. Tyramine and most other chemicals belonging to the amine group greatly diminish brain respiration or oxygen uptake. When benzedrine is added, this effect is neutralized.

Slowing of brain respiration is not so much due to the presence of tyramine itself as to accumulation of aldehyde. This chemical, highly poisonous to respiratory processes in the brain, is formed from tyramine or other amines by the action of an enzyme. Benzedrine also combines with this enzyme, but no aldehyde is formed from this combination. In the competition with benzedrine for the enzyme, tyramine comes off second best, the Cardiff studies showed, with the result that aldehyde formation is checked, and there is no slowing of brain tissue respiration.

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CE FIELDS

ZOOLOGY

"Highest-Up" Rodents Brought Back from Andes

"HIGHEST-UP" among the world's rats and mice are specimens collected above the 15,000-foot level in the Andes by the Magellanic Expedition of the Field Museum, just returned. One species is a chocolate-red mouse, another a somewhat larger rodent called locally "rata Andina." The expedition collected something over 2300 specimens of the principal animal groups, many of them representing evolutionary adaptations to high-altitude life.

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PUBLIC HEALTH

Influenza Increases, Hint of Coming Epidemic

HINT of a coming epidemic of influenza appears in reports to the U. S. Public Health Service, although incomplete reports for the last week in December, latest available, showed a drop in the number of cases.

The number of cases has been steadily increasing ever since October and during December ran from 1,000 to 5,000 cases higher per week than during the five-year median for the same period. For the week ending Dec. 30 there were 4,836 cases reported, but two states, among them South Carolina which has had the highest figures, have not yet reported. The week of Dec. 16, there were 6,455 cases reported throughout the nation, 2,353 of them in South Carolina. The number fell during the week of Dec. 23, and dropped still lower during the week of Dec. 30, but incomplete reporting during the holidays may account for this drop in reported cases.

For the week ending Dec. 30, public health statisticians expected an increase of 25% over the previous week. Unless South Carolina reports a new high figure, this expectation will not be fulfilled. While this seems encouraging, the "steady but not alarming" increase during the winter suggests that an epidemic may nevertheless be on the way.

Two states besides South Carolina have had more than their share of influenza, the reports show. Alabama reported 1,298 cases for the week ending Dec. 30, and Utah reported 964. These figures are considered high in relation to the small population of the states.

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BOTANY

"Plant Architect" Asks Aid From Chemistry

WANTED: More help from chemistry.

This notice is inserted in the *American Journal of Botany* by the man who has lately been doing most toward a chemical control over the evolutionary process in plants, and hence toward a new revolution in practical plant breeding, Dr. Albert F. Blakeslee, of the Cold Spring Harbor, N. Y., laboratories of the Carnegie Institution of Washington.

Dr. Blakeslee's outstanding contribution has been the use of the old-time rheumatism remedy, colchicine, to force a doubling up of the number of the heredity-bearing chromosomes in the cells of plants. This makes possible the juggling of genetic characters in ways not hitherto possible.

But Dr. Blakeslee is not content. If chromosome numbers could be permanently halved instead of doubled, still other moves could be made in the fascinating Mendelian chess game. Some of his friends have been trying to accomplish this by chemical means, but thus far have not succeeded. So that is Want Number One on Dr. Blakeslee's list.

Another wish which he puts up to a possible chemical fairy godmother is for some means to make shoots, bearing leaves and flowers, spring from any part of a plant—from stem, root or leaf. Chemical means have been found for making roots appear on stems, leaves and even flowers, but thus far only roots can be thus evoked. Shoots still evade the search.

Now, shoots are what the geneticist desires above all else, for flowers appear only on shoots, and only from flowers can the hybrid seeds be obtained that unfold the calculated magic of the chromosome-juggler. If one could only touch a chemical wand to a patch of blossomless tissue that gives genetic promise, and cause flowers to spring forth!

Other wishes uttered by Dr. Blakeslee are for chemical means for invigorating the offspring of wide crosses, often too feeble to survive, and even to break down the resistance to crossing between plants whose hybrid offspring he would like to see but for which he has never been able to arrange a successful match.

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MEDICINE

Slowed Down Neutrons Are More Effective for Cancer

SLOW neutrons from the atom-smash-cyclotron, of the kind used in the spectacular splitting of the uranium atom, are five times as effective against cancer as the fast neutrons which are already showing promise as anti-cancer weapons, it was announced at the University of California.

The new, slow-neutron attack on cancer is far from the stage of being used in treatment of human cancer sufferers. It was developed in test-tube experiments with cancer tissue removed from the body by Dr. P. G. Kruger, of the University of Illinois, working with the University of California's cyclotron.

In the new process, fast neutrons coming from the cyclotron are slowed down by passing through a thick block of paraffin. These slow neutrons then enter a test-tube containing cancer cells in a solution of boric acid. The boron atoms of the boric acid capture neutrons which break down the boron into helium and lithium. These fly off and lose their energy in the malignant or cancer tissue and in so doing, destroy its malignancy.

It is possible that the effectiveness of boric acid lies in the very large capture cross section of boron atoms for slow neutrons. This has been demonstrated many times and, in fact, hollow cylinders of boron are used to produce collimated beams of slow neutrons. Only neutrons going through the hole pass through. The others are captured and stopped by the boron atoms.

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BOTANY

Plants Absorb Hydrogen; Use It in Life Processes

HYDROGEN absorption by plants, something never before observed, was reported by Dr. H. Gaffron of the University of Chicago. The plants able to perform this unique feat are one-celled algae, known to botanists as *Scenedesmus*. Kept in an atmosphere of hydrogen in the dark, they absorb the gas and use it in various ways in their life processes. In dim light, they combine hydrogen with carbon dioxide to form food materials. However, if the light becomes too strong, they stop absorbing hydrogen and return to the normal process of combining carbon dioxide with water, giving off oxygen as a by-product.

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