

ASTRONOMY

Cunningham's Comet Nears And Becomes Brighter

See Front Cover

CUNNINGHAM'S COMET, as photographed from the Harvard College Observatory while it was approaching the earth, is shown on the cover illustration. Above the bright coma can faintly be seen the tail. In coming weeks this will lengthen, and the entire thing will brighten, so that it will be easily visible to the naked eye around Christmas.

Because this is the first bright comet since Halley's made its last visit in 1910, Cunningham's comet is attracting a considerable amount of attention.

Science News Letter, November 16, 1940

CHEMISTRY

Trace of Scotch Liquor Gives Whisky Smoky Taste

PEAT smoke flavor of whisky is not proof that it contains a great deal of Scotch. Samples of domestic blended whiskies containing as little as 5% of Scotch malt whisky, the rest being neutral spirits, have been found to have a light peat smoke flavor, Peter Valaer, of the U. S. Bureau of Internal Revenue, reports. (*Industrial and Engineering Chemistry*, July)

Such a whisky cannot, under the Federal Alcohol Administration's rules, be called a "blended Scotch type whisky," Mr. Valaer explains. Generally, 20% to 30% of the Scotch malt whisky is used, blended with neutral grain spirits, and supplemented with caramel coloring and other blending materials in small amounts, among them sugar, sherry, brandy, honey and fruit extracts.

As made in Scotland, the malt whisky, which is prepared from barley, makes up 30% to 50% of the blend, and it is mixed with grain whisky, made from Indian corn imported from Argentina, the United States and elsewhere. This, Mr. Valaer finds, accounts for the difference in the analysis, taste and aroma of the imported product. The best way to ascertain the amount of malt is by measuring the fusel oil in the mixture.

It is the malt whisky that contains the substances giving the peat smoke flavor. In analyses, these can be isolated from the rest of the whisky, and make up about 1/2,000 of the total volume.

Mr. Valaer finds that the Scotch climate has an effect, and the whisky actually gets weaker while it is being aged.

"During the aging under conditions of the unheated humid warehouses of Scotland, the proof goes down," he says. "In the higher, warmer and drier storage conditions of the United States, the proof goes up during storage and aging. As a general class, blended Scotch whisky is imported at about 86° proof, which is lower than many American whiskies as sold to the consumer."

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ASTRONOMY

One Area Of Sun Is Most Active In Producing Spots

EVEN though the sun is a globe of gas without any solid anchorage, one particular area of its surface has been a favorite place for sunspots for at least 75 years. This conclusion is supported by studies made in the last few years, while the sun was passing through a time of great spottedness, by Dr. Fernando Sanford, professor emeritus of physics at Stanford University. (*Science*, Oct. 4)

The time taken by the sun to turn is about 25 days at the equator, and slower nearer the poles. For the belt in the northern hemisphere where many spots appear, Dr. Sanford has taken the time as 27¼ days.

During 180 solar rotations, over periods including the years 1917-1922, 1925-1931 and 1938-1940, the largest spots occurred most often on the fourteenth day of the rotation cycle. On the average, these spots were two thirds again as large as those occurring on the twenty-fourth day, which was the minimum.

Dr. Sanford has extended this back still farther to include two of the largest spots ever recorded. One of these, with an area of 972 million square miles, crossed the center of the sun on Oct. 13, 1865, the other on Oct. 31, 1903. The time between these dates is 13,897 days.

"Allowing 27.25 days to one solar rotation would give exactly 510 solar rotations between the passage of these two great spots," he states.

From the 1865 spot to a large one which crossed the sun July 14, 1940, there were 27,109 days. "Assuming that there were 995 solar rotations in this period," he continues, "a single rotation would require 27.245 days, lacking only seven minutes of 27.25 days." This would be very close agreement.

"Evidently the active region on the sun's surface has persisted for more than 75 years," says Dr. Sanford.

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BOTANY

Holly Leaves Prevented From Falling off Greens

HOLLY, which will soon be moving to market from the Pacific Northwest, its chief cultivation area in this country, often suffers considerable loss in sales value through dropping off of its leaves. A method for preventing this, through treatment with a growth-promoting acid, has been worked out by Dr. J. A. Milbrath and Prof. Henry Hartman of Oregon State College. (*Science*, Nov. 1.)

The holly branches and wreaths are sprayed with, or dipped into a solution of alpha naphthalene acetic acid, one of the growth-promoting substances that has also been found useful in preventing apples from dropping off the trees before they are ripe. Branches treated with a .01% solution of this substance did not lose their leaves in two weeks, even when subsequently exposed to ethylene gas, which completely defoliated untreated branches in two days.

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PUBLIC HEALTH

Bovine Tuberculosis Now Practically Wiped Out

BOVINE tuberculosis is now practically eradicated throughout the United States, the U. S. Department of Agriculture announced. The last two counties, Kings and Merced, in the last State, California, have completed their testing and retesting for infected cattle, and now every county in every state in the Union has fewer than one-half of one per cent of its cattle infected.

The campaign has been going on for 23 years, in the course of which more than 232 million tuberculin tests and retests have been made, and about four million tuberculous cattle detected and removed for slaughter.

This does not mean, it is pointed out, that nothing further remains to be done. Retesting is still called for, especially in herds from which tuberculous animals have been removed in recent years, to prevent reinfection and a new spread of the disease.

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CE FIELDS

PHYSICS—FORESTRY

Wind Tunnel Aids Study Of Forest Fire Conditions

A WIND tunnel, like those used by aviation engineers, has been built at the California Forest and Range Experiment Station for the study of forest fire conditions. It is described in detail in *Journal of Forestry*, (November) by Wallace L. Fons, of the Station staff.

No effort is made to attain the wind velocities commonly attained in the wind tunnels used in aviation research, for these hurricane air speeds have little significance in connection with forest fires. Velocities below 15 miles an hour have been found sufficient for all practical purposes.

A number of other research problems in forestry, outside the field of fire investigation, have been suggested for further use of the tunnel. These include effect of ground cover on wind erosion, evaporation of moisture from soil surfaces, efficiency of various types of windbreaks, distribution of tree seeds, and migration of insect pests.

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ASTRONOMY

Prominent Star in North Increasing in Brightness

AFTER nearly a year in which its brightness remained practically constant, the star gamma, in the prominent northern constellation of Cassiopeia, the queen, has again brightened. Dr. Harlow Shapley, director of the Harvard College Observatory, has been advised by Dr. Ralph B. Baldwin and Robert Tarp-Smith, of the Dearborn Observatory of Northwestern University, on Oct. 29, that the star had brightened about 20% from what it was a week earlier.

This observation followed remarkable changes in the spectrum of the star, observed by Dr. Otto Struve and Dr. P. Swings, of the Yerkes Observatory. The spectrum has shown the presence of a gaseous shell, but this is now fading. A similar effect was observed in 1936.

Then, as now, the star brightened as the spectrum faded.

According to Leon Campbell, of the Harvard Observatory, observations made by amateurs, members of the American Association of Variable Star Observers, from Dec. 1, 1939, to Sept. 15, 1940, showed its brightness constant around magnitude 2.9 and 3.0. When Dr. Baldwin and Mr. Tarp-Smith measured it, the magnitude was 2.6, about 40% brighter than this.

Cassiopeia is the group now visible in the northwestern sky, shaped like a letter M. Gamma is the star at the bottom of the center part of the M.

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INVENTION

Nails Can Be Driven In Sawdust Concrete

CONCRETE made with sawdust is now proving useful in many agricultural applications. It is 14 times better than ordinary concrete as insulation against heat or cold, it floats on water, nails can be driven into it, yet it will not burn, and termites cannot eat it. However, it is not adapted to uses where exposed to wear or water. (For information: *American Society of Agricultural Engineers*, St. Joseph, Mo.)

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MEDICINE—PSYCHOLOGY

Test of Steering Better Than Blood Alcohol Test

A SIMPLE steering test of a man or woman who has been drinking is better than a blood alcohol test for diagnosing drunkenness in automobile drivers, Dr. Henry Newman and Edwin Fletcher, of Stanford University School of Medicine and the Division of Drivers' Licenses, State of California, found in tests of eight women and 57 men. (*Journal, American Medical Association*, Nov. 9).

Both blood tests and performance tests should be used in the diagnosis of drunkenness in drivers, they believe. They suggest that any person before being allowed to drive a motor vehicle should be required to pass tests for minimum standards of skill. A driver suspected of being drunk could then be retested and if his performance fell below the accepted standard, and the presence of alcohol in his blood was proved, he should be convicted of drunken driving, regardless of the concentration of alcohol in his blood.

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MILITARY SCIENCE

Need for Super-Heavy Tanks Less Here Than in Europe

SUPER-HEAVY tanks, such as the Germans used in breaking through the "Little Maginot Line" and crushing Allied resistance early last summer, are not as great a need in the American Army as they are for European nations.

Such is the opinion of Capt. C. R. Kutz, U. S. A., as expressed in *Army Ordnance*. (November-December.)

There are no great fortified lines on this continent, and the nature of our terrain makes their construction unlikely, Capt. Kutz points out. Nevertheless, in a mechanized war, a spearhead of big, heavily armed tanks can do a great deal toward establishing dominance in the field leaving mopping-up and holding jobs for lighter fighting vehicles and for motorized infantry and artillery.

The world-old race between armor and armament is on in deadly earnest, in the ranks of the super-heavies. Most of the 70-to-80-ton tanks used by various powers in earlier phases of the present war carry armor thick enough to stop any shell lighter than 75 millimeters, and some of the armor will even stop some shots of this caliber.

On the other hand, there is a steady tendency for the guns to become heavier and more numerous. The first tanks used in World War I carried only machine guns, but before the end of that struggle tanks were carrying as many as four 75-millimeter guns, and there were some huge ones carrying one 155-millimeter (6-inch) gun apiece, besides lighter pieces. The same tendency holds today.

Capt. Kutz feels that for assurance of success against other super-heavies, modern break-through tanks should carry guns of 75 millimeters caliber, while for attack on strongly fortified positions the 155-millimeter caliber is necessary. An intermediate caliber of 105 millimeters (4-inch) is also available.

All of this runs up tonnage at a terrific rate. Giant tanks are too much for present-day highways, and especially for highway bridges, to carry. It is therefore necessary for them to move up to the battlefield by rail, either on ordinary freight cars or on special, low-slung rolling stock. This in turn limits their height and width to the clearance provided by tunnels, and their weight to what the weakest bridge or trestle on the line will carry.

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