

ASTRONOMY

Sun Refuels Self From Space; It Sweeps Up Hydrogen Gas

Something Like 110,000,000 Tons of Gas Taken Up Each Second If New Astronomical Theory Is Correct

EVERY second the sun sweeps up something like 110,000,000 tons of hydrogen from the space through which it is passing if a new astronomical theory is correct!

Other stars pick up similar amounts of the interstellar gas, and thus keep refueled. This is the suggestion of two Cambridge University astronomers, Dr. R. A. Lyttleton and F. Hoyle. A summary of their theory, answering certain objections that had been made to it, is given in the latest issue of the Monthly Notices of the Royal Astronomical Society, just received in the United States.

During the last few years astronomers have generally accepted the idea that the stars keep going by a transmutation process in which hydrogen turns into helium, giving off energy as it does so. However, the Cambridge scientists state, "the available astronomical evidence, particularly from double stars, led us to the view that a further potential source of energy must be introduced from outside the stars, either continually or intermittently replenishing the hydrogen in the star."

As it is now known that space between the stars is not the perfectly empty void it was once thought to be, but contains about as much matter as the stars themselves, in the form of diffuse clouds, they concluded that the stars might sweep up hydrogen from these clouds as they went through them. Though these clouds consist largely of calcium and sodium, which would not add to the stars' lives, as little as 10% of their mass in hydrogen in the form of molecules would suffice to keep the stars going. Recent observations have shown that molecules containing hydrogen actually are present in the cosmic clouds.

They also suppose that the cloud is irregular, and is concentrated towards the central plane of the Milky Way. Here, they calculate, the density would be such that a gram of matter (which is about a twenty eighth of an ounce) would be contained in a cube some 1300 miles on a side. Studies of other systems

like the Milky Way have shown that they are about as dense as this in their centers. Dr. Lyttleton and Mr. Hoyle regard as supporting evidence for this idea the fact that the brightest and most massive stars are in the plane of the Milky Way. Evidently these pick up more matter and fuel than stars in thinner regions.

"The real need at present in this problem," they conclude, "is for trustworthy observations leading to information of the density distributions and velocities of the stars relative to the cloud." These might confirm the theory, disprove it, or require it to be modified. "At present," it is stated, "in regard to stellar

evolution, the choice is between the consistent theory based on the idea of accretion and no theory at all."

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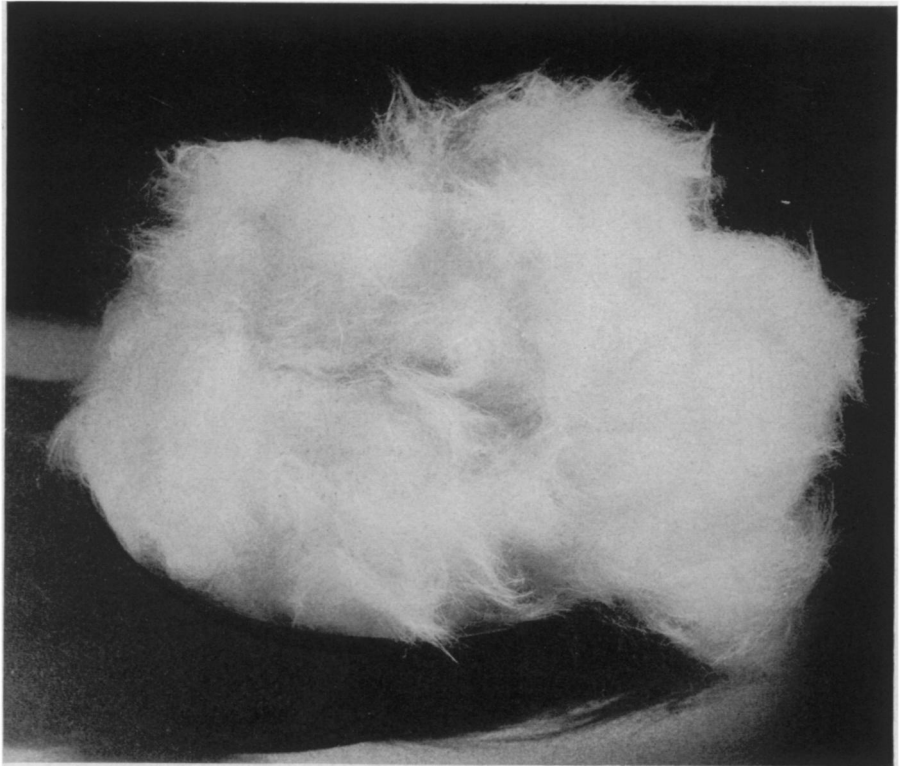
ENTOMOLOGY

Electron Microscope Shows Insect Body Structure

MINUTE structures in the tiny anatomy of an insect, hitherto unknown and unsuspected, have been disclosed under the hundred-thousand-fold magnifications of the electron microscope in the RCA laboratories. The breathing tubes in the sides of a mosquito's body are shown to be lined with elastic hoops a fifty-thousandth of an inch broad. These in turn are covered with submicroscopic spines less than a quarter-millionth of an inch high.

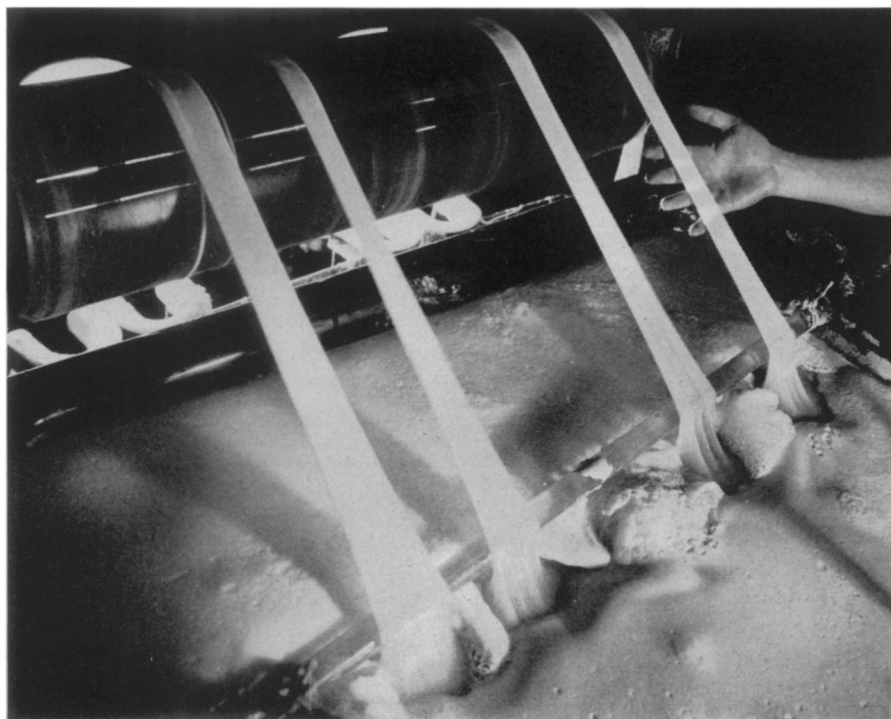
Other submicroscopic studies are being made on skin, wings and bristles of butterflies, bees, flies, beetles and cockroaches. The powerful instrument is being used to disclose details of the shells of their tiny eggs.

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FIBER FROM MILK

Here it is cut into short lengths for blending with other fibers used in the textile industry, such as cotton, wool, mohair, rayon or hat fur. But the milk fiber can be cut to any length desired from a half inch to a half mile.



"SPINNING" MILK

Four spinnerets are concealed beneath the foamy mass in the spinning box. The four "tapes" are really thousands of strands of fiber. Look at the hand and see how translucent they are.

CHEMISTRY

New Process Makes Fabrics From Cow's Milk Practical

More Expensive Than Rayon and Cotton, But Cheaper Than Wool and Fur, New Fabrics Are Now Being Made

AMERICANS will be wearing dresses and other clothes made from milk by spring, and Bossy the cow will be launched in a new role as fashion aid, is the forecast by dairy products researchers.

Success in processing a new textile fiber from casein, by-product of skim milk, after four years of experimenting, is cause for the predictions by the National Dairy Products Corporation.

The fiber is said to be the first derived from milk which is "acceptable to the American textile industry," and fabrics are now being manufactured containing threads of milk.

Described as more expensive than rayon and cotton, and less expensive than wool and fur, the new fiber called "Aralac" is said to blend well with other

textile fibers and to have attractive draping quality. It is already being used as part material in felt hats.

A new-found use for the milk fiber is in protecting the hair during permanent waving. In experiments, it is reported, a special braid of the fiber proved suitable for winding with the hair ends before they are heated and waved.

A factory for producing the milk fiber at Taftville, Conn., is operating on a 24-hour basis and has a production capacity of about 5,000,000 pounds a year.

While powdered skim milk is now being routed to England in large shipments, in more normal circumstances America has literally billions of pounds of skim milk left over from butter and cream making, as potential clothing ma-

terial. The dairy research scientists say that they are now seeking new uses for the whey left over after casein is extracted from skim milk.

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DENTISTRY

Apple a Day May Keep Dentist Away—New Version

"AN APPLE a day may keep the dentist away" seems to be the new version of the old slogan about the health values of apples. A fairly firm, chewy apple, taken in generous bites that require considerable chewing, is more efficient than your toothbrush in cleansing your entire mouth, Dr. Holmes T. Knighton, of the University of Louisville, Ky., told the American Dental Association.

Oranges, eaten sliced so that you get plenty of pulp to chew on, are almost as good as apples for mouth cleansing. Dr. Knighton found in 210 tests of chewing as a mouth and teeth cleansing method.

The tests, made on 10 persons, started with eating a cake of yeast. At the end of the test, the number of yeast cells in a cubic centimeter of saliva were counted to measure the relative efficiency of the various cleansing methods.

Brushing the teeth for three minutes with tooth paste followed by rinsing with about five ounces of tap water rated 63% efficient in mouth cleansing. The apple chewing rated 96.7% efficient, with the orange a close second at 95%. Chewing paraffin also rated 95%.

Chewing gum showed to disadvantage alongside the paraffin because it steadily decreased in bulk, shrinking to one-fourth its original size after a few minutes of chewing. Its efficiency rating as a mouth cleanser was 82.7%. Eating about two ounces of a chewy candy bar rated 93%. Eating about five ounces of ripe banana rated 72.5%.

"The cleansing effects of chewing paraffin and gum may be due to the mechanical effect of friction and to increased salivation," Dr. Knighton said. "The chewy candy bar made contact with a very large percentage of the surfaces of the mouth and was soluble enough to permit even dilution of samples one hour after it was consumed. The fact that loose yeast particles were well scattered over the mouth and not merely on the teeth probably accounts for the relative inefficiency of the tooth brush."

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