

ASTRONOMY

Stars' Darkness Explained

► THE MYSTERIOUS darkness of the rare giants called carbon stars has apparently been explained by two University of California scientists who simulated part of the giants' atmospheres in the laboratory.

The stars, which have an excess of carbon, measure a hundred times or more the diameter of the sun. They appear to be much hotter than the sun at the center. Yet their ultraviolet light, a natural component of all light sources, is so weak as to be nearly undetectable.

Searching for a reason for the darkness, Drs. John G. Phillips, astronomer, and Leo Brewer, chemist, heated materials in a small electrical furnace.

Although the laboratory temperatures reached, 2,000 to 3,000 degrees centigrade, correspond only to the temperatures of the atmospheres of the cooler stars, they were high enough to create bizarre molecules of carbon. Of special interest was one in which three atoms of carbon are linked.

The spectrum of this carbon molecule, which does not exist at ordinary tempera-

tures, corresponds to a very strong carbon spectrum found in the giant stars.

The existence of large quantities of this molecule in the atmospheres of carbon stars could account for absorption of most of the ultraviolet light, explaining the great weakness of this part of the spectrum, the scientists said.

The carbon stars are interesting because, in addition to having an excess of carbon, they appear to be "factories" of heavy elements that may be changing the chemical composition of the galaxy.

The enormous heats at the centers of the carbon stars, approaching a hundred million degrees absolute, generate neutrons which are added to lighter elements in successive nuclear transformations. The resulting heavy elements apparently are eventually spewed into space through diffusion or explosion, with the possibility that the chemical composition of the galaxy may be changing in the direction of a gradual increase in the heavier elements.

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MEDICINE

Find Possible Cancer Link

► TOO GREAT a production of hormones may be associated with human lung cancer, Dr. Sheldon C. Sommers, a pathologist at Boston University, has discovered.

The scientist studied the hormone-producing glands of 210 men and women who died of lung cancer and found that the biggest gland changes had taken place in women with adeno cancer of the lung, a form of the disease in which the gland-like parts of the lung are involved.

These women showed overgrowths of ovarian tissue, breast tissue and uterine linings two or three times more frequently than normal, Dr. Sommers reported.

This indicates overactivity of the female ovarian hormone estrogen, he explained.

The women also showed increases in the pituitary glands which produce growth hormone and adrenal glands which produce sex and stress hormones.

Only 11% of the women with adeno cancer had completely normal glands while 63% of non-cancerous women did.

Evidence of increased hormone production was also found in men. Pituitary cells were increased in 80% or 90% of the cases, while this was found in only two percent of a control group. Lung cancer cases also showed a high frequency of abnormality of the male sperm-producing cells.

These and other studies support a theory that cancer may be produced in two stages. In the case of epidermoid lung cancer, the type associated with cigarette smoking, the first stage of tissue overgrowth may be caused by one or a combination of irritants, including air pollution, bacteria, allergens and tobacco.

Then the second stage, cancer production, might be brought about by tissue response to changes in the pituitary, adrenals and possibly other glands.

The research was reported by the Massachusetts division of the American Cancer Society.

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VIROLOGY

Learn How Viruses Kill Living Cells and Spread

► HOW VIRUSES execute living cells and spread infection may be explained by research reported by University of California scientists in the *Journal of General Physiology*.

Apparently when viruses invade an injured cell, they force the cell to manufacture a special kind of chemical, an enzyme called virolysin. This chemical attacks a sugar-like substance that holds the cell wall together, causing a virtual explosion of the cell wall. In the explosion, the viruses are released, to invade other cells.

This picture of virus infection is suggested by Drs. Doris J. Ralston, Miriam Lieberman, Beatrice S. Baer, and Dr. A. P. Krueger of the department of bacteriology, whose research was supported by the Office of Naval Research.

The scientists discovered virolysin about two years ago. At that time they were studying another cell-exploding enzyme called autolysin, which bursts cells after they are dead. Virolysin was popping cells prematurely.

The scientists showed that virolysin is

present only in infected cells and not in normal ones. Autolysin, on the other hand, is present in both normal and infected cells.

The demonstration that viruses can force a cell to manufacture a new enzyme, namely virolysin, is the first time this capacity of viruses has been demonstrated.

The work is the first experimental evidence of the correctness of the theory upon which extensive research for anti-viral drugs has been based, namely, that viruses can generate new enzyme systems.

The work thus strengthens the hope that the current line of drug research may succeed. A successful drug against a virus probably would be one that will destroy only the new enzyme produced by the virus without affecting the normal components of the cell.

The research was done with viruses that attack bacteria.

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SOCIOLOGY

Most Men Like Their Jobs And Want to Work if Rich

► WHAT WOULD YOU do if someone gave you enough money on which to retire comfortably?

The chances are you would want to continue to work and the odds are better than even that you would continue to do the type of work you are doing.

These are some of the findings of a nation-wide study of the meaning of work conducted by the Survey Research Center of the University of Michigan's Institute for Social Research in Ann Arbor.

The study shows that four out of every five American men now working would want to go right on working even if they inherited enough money on which to live comfortably without the weekly pay check.

Some persons would use the opportunity to switch their type of present work, if they could. But more than two-thirds of the nation's farmers and three-fifths of the men in middle class jobs would still stick to the work they are doing.

Having a job means a good deal more than just making a living, Nancy C. Morse and Robert S. Weiss, who wrote the report of the study, conclude.

Professionals, managers employed by others and sales personnel claim their work is too interesting or full of prestige to want to quit. Skilled laborers say life without work would seem equivalent to life without anything to do.

Among the classes of employees, the study reveals, only the unskilled show any major difference in their desire to stay on the job. Almost half of them would quit if they did not have to earn a living.

Persons in less interesting and less prestigious jobs are more likely to want to change jobs if they had the chance. Most want to go into business for themselves, "a transition not seen as requiring much additional formal education and training."

When viewed together, the researchers report, American men like their work and 80% say they are either "very satisfied" or "satisfied" with their jobs.

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