

PHYSICS

**A-Bomb Debris Element
In Contracting Stars**

► AN ELEMENT that is unknown on earth except when made by atomic bombardment as in the A-bomb exists in large quantity in some giant stars.

A new theory of how technetium, element 43, once a mere hole in the chemical table of elements, is created in the stars by thermonuclear reactions was presented to the American Physical Society meeting in Chicago by Dr. A. G. W. Cameron of Iowa State College.

Thermonuclear reactions are the sort that are involved in the H-bomb, in which the lighter elements are fused with loss of matter that is converted into energy. When hydrogen which fuels such a reaction is exhausted in a giant star, the core is expected to contract and the central temperature rise until thermonuclear reactions with helium begin. When the temperature reaches approximately 100,000,000 degrees on the absolute scale, in Dr. Cameron's theory, a kind of heavy carbon, atomic weight 13, when bombarded with an alpha particle or helium atom, would create an oxygen atom of the ordinary sort, weight 16, and give off a neutron.

The plentiful supply of neutrons thus generated would be captured by heavier elements that are in the star and change them into the kinds of elements that the spectra of light from the stars show to be present. Among the elements formed in this way would be technetium, non-existent in stable form on earth but plentiful in these stars.

Science News Letter, December 12, 1953

BIOCHEMISTRY

**Muscle Built Through
Action of Glutathione**

► MUSCLE AND other protein tissue of the body may be built up through the chemical action of glutathione.

This is a theory of Dr. Daniel Mazia, professor of zoology at the University of California, who developed it from research with sea urchin eggs. (See SNL, June 13, p. 361.) He sees glutathione as a sort of coordinator in chemical by-play which adds structural elements to living cells. Glutathione, which is itself "protein-like," builds up proteins by its effect on sulfur atoms in protein molecules.

Scientists have found growing evidence recently that sulfur is of vital importance in basic life processes.

Dr. Mazia suggests that glutathione may have the capacity to break the bonds between sulfur atoms in protein molecules, then to link two or more molecules together by joining the "hanging" sulfur atoms. He believes the glutathione is not used up in the process, but simply makes it work.

Glutathione is made from some of the same building blocks as proteins, but put

together into a smaller package and in a different way. The chemical occurs in most body tissues, it is important in respiratory enzyme system, and deficiencies have resulted in cataract formation in the eyes.

Dr. Mazia presented his theory at a symposium on glutathione, sponsored by the National Science Foundation, at Ridgefield, Conn.

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RADIO ASTRONOMY

**Radio Star's "Noise"
Dimmed by Sun's Corona**

► ASTRONOMERS EXPECT next June, for the third and possibly last time in several years, to measure how large the usually invisible solar corona is when "viewed" by radio waves. It may be as much as 15 times larger than the visible sun, observations by Dr. F. G. Smith and his associates at Cavendish Laboratory, England, have indicated.

Dr. Smith revealed plans for recording the scattering, or dimming, of short radio waves from a noisy radio "star" as the sun passes between the star and the earth next June. The radio source is in the constellation of Taurus, the bull, and is thought to be the Crab Nebula, expanding remnants of a star that was seen to burst into a nova almost a thousand years ago.

The radio astronomers plan next June to confirm observations, made on this source in the last two years, showing irregularities in the solar corona at extreme distances from the visible surface, many times farther than that observed visually.

After 1954, radiation from sunspots will be very likely to spoil chances of observing the "radio occultation" of Taurus, Dr. Smith, now a visiting scientist at Carnegie Institution of Washington, said.

Attempts to record the radio wave dimming were made this year at 38, 81.5 and 210 megacycles. Observations were successful at 38 and 81.5 megacycles, but no effects were found at 210 megacycles, according to Dr. A. Hewish, also of the Cavendish Laboratory. Results of the 1953 observations will be reported in *Nature*.

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MEDICINE

**Patients to Give Selves
ACTH Like Insulin**

► PATIENTS WITH under-functioning pituitary glands will in future be giving themselves ACTH just as diabetics give themselves insulin now to remain well.

This prospect is foreseen by Dr. Ralph A. Kinsella Jr. of St. Louis University School of Medicine.

A 67-year-old man whose pituitary gland in the head was practically destroyed by a tumor has been living for three and a half years and is still in good health through regular prescribed doses of ACTH (Gel), Dr. Kinsella reported at the meeting of the American Medical Association in St. Louis.

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IN SCIEN

BIOLOGY

**Hours of Light Control
Breeding of Sheep**

► SHEEP AND goats breed out-of-season when their days are shortened artificially, Dr. Orson N. Eaton, National Academy of Sciences, and Victor L. Simmons, U. S. Department of Agriculture, have found.

Normally, these animals breed in the fall during the period of decreasing daylight. This gives a crop of spring lambs for the sheep and summer milk production for the goats.

The scientists found that if the animals were kept in rooms with controlled amounts of light, many would breed in the spring and summer producing lambs and kids in the fall.

The birth weight of the fall lambs and kids was less than spring animals, and deaths were more frequent at birth and during the first month of life with the animals born in the fall.

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ASTRONOMY

**Galaxies in Collision
Not Radio "Star" Source**

► GALAXIES IN collision may not be the source of the radio "star" in Cygnus, Drs. R. C. Jennison and M. K. Das Gupta of the Jodrell Bank Experimental Station report in *Nature* (Nov. 28).

Last year Drs. Walter Baade and Rudolph L. Minkowski of Mount Wilson and Palomar Observatories reported that they had spotted a visual object that had the same position as the strong radio signals picked up here on earth from the constellation of Cygnus, the swan.

Now, using a radio telescope that allows them to pinpoint more accurately the exact spot from which the radio waves are coming, Drs. Jennison and Das Gupta have concluded that "there would appear to be no direct correlation between the radio emission and the visible light from the colliding galaxies."

The radio source, they find, is much larger than the visual object spotted by Drs. Baade and Minkowski. The radio source actually consists of two distinct parts, one on each side of the visual object, thus straddling it "with little overlap between the regions of optical and radio emission."

Since the visual object in Cygnus that is straddled by the radio source is the only case yet observed of galaxies in collision, many astronomers believe it unlikely that some of the strongest radio signals in the heavens and the strange visual object are not related.

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CE FIELDS

VETERINARY MEDICINE

Handle Brucellosis Vaccine With Care

► A WARNING to use care in handling strain 19 when vaccinating cattle against brucellosis is given by Drs. Wesley W. Spink and Hugh Thompson of the University of Minnesota Hospitals and Medical Schools in the *Journal of the American Medical Association* (Nov. 28).

Two veterinarians got sick after accidentally getting some of this *Brucella abortus*, strain 19, into their bodies, the Minneapolis doctors report. This is the first time that scientists have had proof that strain 19 can cause the sickness in humans.

Use of strain 19 in the campaign to wipe out brucellosis, also called Bang's disease and infectious abortion in cows, should not be curtailed because of this report, the doctors state.

Brucellosis is a serious, sometimes fatal disease in humans who can get it from infected animals and from milk and milk products from infected cows if the milk has not been pasteurized. Efforts to protect cattle and, through them, humans, should continue, the Minneapolis doctors imply, although they state that strain 19 should be used "cautiously and only by properly qualified persons."

The two veterinarians who got brucellosis from strain 19 got the germs in their bodies, in one case, when the needle of the vaccine syringe accidentally stuck his hand and, in the other, when the vaccine splashed into his eyes.

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MEDICINE

Cancer Pessimism No Longer Warranted

► "THE PALL of pessimism" which surrounds the attitude of many people toward treatment of cancer in general and cancer of the lung in particular is "less warranted today than at any time in history," Dr. Duane Carr of the University of Tennessee College of Medicine declared at the meeting of the American Medical Association in St. Louis.

Many lung cancers, he said, are being cured by early diagnosis and complete surgical removal before the cancer has had a chance to spread. Many of these cancers are being detected in the early, curable stage by routine chest X-rays.

Unfortunately, Dr. Carr said, too many people never have these routine chest X-rays. But even for those whose cancers have advanced beyond the stage of surgical removal and cure, deep, high-voltage X-ray treatments and nitrogen mustard and melamine

can relieve symptoms and bring renewed energy and feeling of well-being for a time.

Important aid to early discovery of lung cancer, heart disease and tuberculosis is the expanding program of routine small film chest X-rays, Dr. John H. Skavlem of Cincinnati declared. He reported that more than 15,000,000 such X-rays are now being taken annually, and commended the 700 or so hospitals in the United States that are routinely taking chest X-ray pictures of all patients as they are admitted to the hospital, regardless of the condition for which they enter.

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PLANT PATHOLOGY

Tobacco Plants Live Weeks Without Oxygen

► FLUE-CURED TOBACCO plants can live at least two weeks without oxygen, C. H. M. van Bavel of North Carolina State College reported to the American Society of Agronomy meeting in Dallas, Tex.

Streams of mixed gases were forced into sealed containers of growing tobacco plants for periods of two weeks. Contrary to expectations, the plants did not die when completely deprived of oxygen, he said.

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MEDICINE

New Medical Group to Humanize Patient Care

► A NEW medical group that aims to improve and humanize medical care by treating the patient's sick feelings and sick organs at the same time has been organized.

It is called the Academy of Psychosomatic Medicine. Its officers are: president, Dr. William Kaufman of Bridgeport, Conn.; vice-president, Dr. B. B. Raginsky of Montreal, Canada; secretary, Dr. Ethan Allan Brown of Boston, Mass., and treasurer, Dr. Alfred J. Cantor of Flushing, N. Y.

Members will be leading surgeons, rehabilitation experts, internists, anesthesiologists, ophthalmologists, gynecologists, obstetricians, psychiatrists, hospital administrators, pediatricians, geriatricians, dermatologists, allergists and other medical specialists. The important work of this organization will be carried out through clinical and laboratory research, medical meetings and forums, and through creation of a new medical journal.

"Today's patient," Dr. Kaufman points out in explaining the aims of the new group, "while benefiting from the newest technological advances, is often treated as if he were a sick liver, nose, pair of lungs or heart, rather than an ailing human being. By treating not only the disease but also the person who has it, a doctor, regardless of his specialty, can increase the effectiveness of his treatment, and at the same time prevent crippling psychosomatic reactions to illness which a patient might otherwise have."

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AGRICULTURE

Grass With Deep Roots Resists Drought Best

► DEEP ROOTS are the best assurance a farmer can have that his field grass for cattle grazing will resist drought conditions, Dr. Glenn W. Burton, Earl DeVane and R. L. Carter of the U. S. Department of Agriculture told the American Society of Agronomy meeting in Dallas, Tex.

The roots of Coastal Bermuda grass reach a depth of eight feet within three months after late March planting. This gives the grass a larger feeding area and it can tap any water at the lower depths during times of drought, they reported.

Other drought-resistant varieties are Pangola grass with roots six feet deep in three months, and Bermuda and Dallis grass with roots four feet deep in that time.

The scientists checked the depth of root growth by planting the grass in sod squares over placements of radioactive phosphate fertilizer at different depths in a sandy soil. When the roots reached the radioactive phosphate layer, this could be detected by a Geiger counter placed near the above-ground parts of the plant that would react to any radioactive elements in the sap.

Grasses such as common Bahia, Pensacola Bahia, tall fescue and carpet grass with roots that penetrate very slowly are much less drought resistant. In three months these grass roots had only gone two feet into the soil.

All these grasses are commonly used by cattle growers for forage crops. They are seldom used for lawns though Bermuda grass is sometimes found in southern states in lawns.

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SURGERY

Skin Grafts Repair Internal Organs

► SURGEONS HAVE now successfully grown skin from the outside of the body on the inside. The success of this operation promises many new clinical applications of skin grafts, ranging from replacement of blood vessels to repair of bleeding livers.

In experiments on 35 adult dogs by Dr. Charles Horton and other surgeons of the Medical School of Duke University, division of plastic surgery, grafts from the outer skin of the animals were placed on various organs in the abdominal cavity, including the liver, spleen, intestine and stomach. All of these grafts grew well.

The surgeons are hopeful that the continuation of these experiments will lead the way to the application of grafts intra-abdominally in human surgery. In fact, they have observed such a dramatic effect of skin grafts on bleeding surfaces of the liver that they would now advocate their use for the control of hemorrhage if liver bleeding appeared otherwise uncontrollable.

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