

MEDICINE

Bone Cancer Seasonal In Young Men and Women

THERE IS A SEASON for bone cancer. A study of bone sarcomas or tumors in some 74 persons indicates there is a seasonal rhythm in the onset of symptoms. There were more tumors during the months June through November than for December through May, a researcher reports in *Nature*.

Dr. C. H. G. Price of the University of Bristol says that patients under 30 years of age with tumors of the long bones were asked when they first complained of any "definite symptoms" directly related to their bone tumor. About nine cases a month had bone pain, or pain and local swelling, first apparent in the summer and fall; the winter and spring averaged about three cases a month. These differences do not appear in persons older than 30 years of age, Dr. Price points out.

This "summer incidence" in bone tumors appears about three months after the spring peak in bone-growth. Possibly there is a "biological linkage" between the spring growth and the subsequent appearance of bone tumors, the British scientist suggests.

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ASTRONOMY

Solar System Studied At Short Wavelengths

ADVANCES IN KNOWLEDGE about the moon and nearby planets in the solar system are being made by studying the radiations they broadcast at short wavelengths, ten scientists from the U. S. Naval Research Laboratory, Washington, D. C., and Columbia University have reported.

Dr. Robert J. Coates of NRL told the American Astronomical Society meeting that maps of the moon at wavelengths of about one-fifth of an inch showed "distinct features." Some areas, he said, are hotter and some are colder than their surroundings. The brightness distribution of the moon varies with the lunar phase and depends on the wavelength used.

Radar measurements of the moon's mean distance indicate its center is close to 24,025 miles from the earth's center, Drs. R. H. Bruton, K. J. Craig and B. S. Yapple of NRL reported. Using this distance, they have calculated that the mean equatorial radius of the earth is about 3,986 miles.

Observations of Jupiter and Mars at wavelengths of about one inch were reported by Drs. J. A. Giordmaine, L. E. Alsop and C. H. Townes of Columbia University and Dr. C. H. Mayer of NRL. They believe the radiation they found from Jupiter is due to heat emitted by ammonia in the region near the top of the cloud layer. The observations were made with NRL's 50-foot steerable reflector with a maser amplifier at the focus.

At wavelengths of four inches, Dr. Russell M. Sloanaker of NRL said he found a mean temperature for Mars of about 692 degrees Fahrenheit. This temperature, he reported, is three or four times higher than

that found at wavelengths slightly longer than one inch. There may be a cyclical variation in the Mars temperature, correlated with its rotation rate, he said.

At wavelengths of 21 centimeters, or slightly more than eight inches, Dr. Edward F. McClain of NRL attempted to correlate the possible variable temperature of Jupiter noted by other radio astronomers with the density of solar particles as indicated by magnetic storms on earth. No correlation was found, but he did discover a "slight suggestion" of elevated temperatures on Jupiter following a major flare on the sun on May 10.

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CHEMISTRY

Free Radicals Show Trend to Cryogenics

THE GREAT PROMISE of a new energy source—the use of free radicals trapped in their reactive state—is not in rocket propellants, as once thought, but in chemistry and physics.

Much progress is being made in understanding these fragments of molecules that usually exist only for thousandths of a second. For three days (Aug. 31 to Sept 2), more than 400 scientists from the United States, Canada, Great Britain, Sweden and Russia met in Washington to exchange their latest research findings on free radicals.

Particular emphasis was given to trapping of free radicals at very low temperatures, within a few degrees of absolute zero, which is 459.7 degrees below zero Fahrenheit. The study of free radicals has pointed up the present-day trend toward low-temperature chemistry, Dr. H. P. Broida of the National Bureau of Standards told SCIENCE SERVICE. Dr. Broida headed a three-year program at NBS in which Government, university and industrial scientists cooperated to learn more about the physical and chemical properties of free radicals.

One possible practical application of free radicals, he suggested, could be in an infrared detecting device. Free radicals occur in the chemical reactions of living tissue, in the hot atmospheres of the sun and other stars, and in automobile and rocket engines. They are formed when molecules are broken up by applying energy to them.

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EDUCATION

Supplementary Training For Science Teachers

A PROGRAM to further science education will benefit some 10,000 teachers in after-hours training during 1960-61.

The National Science Foundation will support about 200 In-Service Institutes for Secondary School Teachers of Science and Mathematics.

This program is designed to assist colleges and universities to encourage teachers in local and outlying school districts to take advantage of further scientific training facilities.

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IN SCIEN

BOTANY

Dwarf Mistletoe Seeds Are Faster Than Rocket

THE INITIAL ACCELERATION of a tiny seed in flight is thousands of times faster than that of a man-made rocket.

The explosive seed of the dwarf mistletoe gets shot out of its pod at an initial acceleration of some 5,000 g's. In contrast, a typical satellite-launching rocket's initial acceleration is between five and ten g's.

"As far as I know," reports F. G. Hawksworth of the U. S. Forest Service, Fort Collins, Colo., "no calculations have been made of the initial velocity or other ballistic factors of the dwarf mistletoes or any other higher plants with explosive fruits."

He reports in *Science* (Aug. 28) that the seeds have an initial velocity of about 1,370 centimeters per second or about 45 feet per second. This compares with a rocket's escape velocity of about 36,800 feet per second.

The seed's shape approaches the "ideal" for the most efficient projectile, Mr. Hawksworth says. Its forward end is rounded and the other end is pointed.

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MEDICINE

Fever Must be Nourished Not Starved, Doctors Say

THE OLD SAYING "feed a cold and starve a fever" is wrong.

A fever must be watered and fed, not starved; warn two physicians at the Medical Research Institute of Michael Reese Hospital in Chicago.

Fever leads to the breakdown of body tissues, Drs. Rachmiel Levine and Sidney Cohen report, and the body loses water. At high temperatures the body cells work and break down faster. When a fever reaches 103 degrees Fahrenheit or more, it becomes dangerous, they said. The central nervous system does not function normally and high fever can injure the heart.

A child's body temperature will react more sharply with a fever than does an older person's. Reactions to fever-causing agents are slower and not as drastic in the older person, Drs. Levine and Cohen report in *Today's Health* (Sept.).

There is no general remedy for fever, they say. Fever caused by infection is reduced by eliminating the infectious agent. Other causes of fever include food intake, excessive fatigue, hypersensitivity to drugs, cirrhosis of the liver and pregnancy. Fever, the scientists point out, is not a disease but rather a symptom which should be thoroughly investigated by a medical doctor. Some persons, however, have a normally higher-than-average temperature.

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CE FIELDS

MARINE BIOLOGY

Surface Organisms Live In Deep Water Pressure

MARINE ORGANISMS that normally live in surface waters can survive the greatly increased hydrostatic pressures found in deeper water.

A Japanese scientist told the International Oceanographic Congress in New York that such organisms can tolerate both a great and a rapid change in hydrostatic pressure.

Kazuo Sano, of the Fisheries Department at Tokyo University, reported the results of a deep-sea survey of the Japan Trench from a diving sphere, carried out by Japanese and French scientists last summer.

He found that surface organisms could survive a pressure change from one atmosphere to 300 atmospheres within a few hours. One atmosphere equals 14.7 pounds to the square inch.

Except for the knowledge that some animals migrate daily from deep water to the surface and back, the scientist reported, little has been known about how surface animals fared in deep water with high pressures.

The organisms involved in the survey were species of green algae, bryozoans, bivalves and crustaceans.

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PSYCHOLOGY

Attitude of Attendant Affects Mental Patient

THE HOSPITAL ATTENDANT who hates Negroes, Catholics or Jews is likely to have the same attitude toward mental patients and treat them as dangerous and having low status.

Unfortunately, this kind of attitude is held by more than half, 54%, of the personnel in a large mental hospital.

This was shown by a study of the attitudes toward patients in the Franklin D. Roosevelt Veterans Administration Hospital at Montrose, N. Y. Results were reported by Dr. Jacob Cohen of New York University and Dr. E. L. Struening of the Montrose VA Hospital at the American Psychological Association meeting in Cincinnati.

In the past decade, it has become more and more evident that mental patients are sensitive to and influenced by the atmosphere created by hospital employees. Similarly, the success of former mental patients in re-adjusting to society is affected by the attitudes of the general public.

Five types of attitudes were found among the personnel at Montrose. Attitude A, called Authoritarianism, is the one held by those swayed by racial and religious prejudice. This is the attitude that looks on mental patients as unpredictable and dangerous and considers that society needs

protection from them by confining them behind locked doors.

By contrast, psychiatrists, psychologists and social workers have the attitude that "patients are people," and consider that mental patients have more similarities than differences from non-patients. They also emphasize a belief in the efficacy of hospital treatment.

However, these professional people spend relatively little time with the patients. The attendants and nurses who provide the hour-to-hour social atmosphere around the patients do not generally subscribe to this attitude C, held by only 12%.

A slightly higher percentage, 13%, have a kindly paternalistic attitude toward patients and regard them as unruly children who need to be cared for and gently supervised—attitude B.

Attitudes D and E, are each held by about 10% of the personnel. One emphasizes the need to restrict patients both during and after hospitalization to protect society. The other is concerned with the importance of interpersonal relationships, especially early love deprivation.

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ASTRONOMY

New Method for Finding Mass of Mars Proposed

A METHOD for finding the mass of Mars was reported to the American Astronomical Society Meeting in Toronto.

Dr. Eugene Rabe of the University of Cincinnati Observatory said observations of a tiny minor planet, the asteroid known as Laodamia, could give the mass of Mars "to a very considerable degree of accuracy." The asteroid, he reported, causes changes in the orbital motion of Mars "many times larger" than the effects of Mars on the orbital motion of Laodamia.

Although the minor planet is very faint, a sufficient number of accurate observations when the two objects are close would give the Martian mass. In March, 1961, Mars and Laodamia will come within some 9,300,000 miles of each other, a "close" approach astronomically speaking. The mass of Mars is calculated to be about one-tenth that of the earth.

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GEOPHYSICS

Detailed Information on High H-Bombs Reported

DETAILED INFORMATION on the effects of hydrogen bombs exploded high over the Pacific Ocean more than a year ago are reported in three separate papers in *Nature*.

Five New Zealand scientists and a Japanese scientist working in the United States described the effects produced by the H-bomb blasts on the radio-reflecting ionosphere and the earth's magnetic field, and in causing auroras. The bombs were exploded high in the atmosphere over the Pacific Ocean near Johnston Island on Aug. 1 and 12, 1958.

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BIOCHEMISTRY

Radiation Therapy for Cancer Improved

A CHEMICAL COMPOUND has been found that reduces the amount of cancer-killing radiation needed to treat patients with this dread disease.

BUDR, or 5-bromodeoxyuridine as the compound is known, "dramatically" and "strongly" improves the killing effects of radiation, Dr. Waclaw T. Szybalski of the Rutgers Institute of Microbiology reported.

Apparently growing cells accept BUDR as a substitute for thymidine. It is very similar to this chemical, a compound normally found in the cell's deoxyribonucleic acid (DNA). Once the growing cells have accepted BUDR, they are much more likely to die from radiation, Dr. Szybalski told scientists attending the Genetics Society of America meeting as part of the American Institute of Biological Sciences at University Park, Pa. In one experiment, he pointed out, a radiation level that killed only 50% of normal cells, killed 99.99% of the BUDR-treated cells.

In other experiments only one-tenth as much radiation was needed to kill BUDR-treated cells as was needed for normal cells.

Since many cancer cells multiply in the body much more rapidly than normal cells, Dr. Szybalski suggested that it may be possible to increase selectively the radiation sensitivity of cancerous tissue. Much of the research in the field of cancer treatment has been directed at delivering higher and higher doses of radiation to the cancer cells, the scientist said.

He was assisted in his studies by Bozidor Djordjevic, a graduate student from Yugoslavia.

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AGRICULTURE

Trees Protected Against Fungus Growth Infection

AN ANTISEPTIC PAINT may soon be available for the home gardener's wounded trees.

A fungus-killing chemical has been added to the asphalt varnish used in painting tree wounds. It prevents growth of fungi, tiny plants that cause decay in shade trees, and it may keep decay out of wounds made by pruning or trimming trees, two U. S. Department of Agriculture scientists have found.

The antiseptic quality of asphalt varnish containing 0.25% phenyl mercury nitrate was established in laboratory experiments, Dr. Curtis May and John G. Palmer told the American Phytopathological Society meeting in University Park, Pa. The varnish alone, or with several other common fungicides, was not effective against the tree-rotting fungi, they said.

It may now be profitable to industry to market the fungicide varnish for the home gardener's use. The scientists cautioned against "mixing your own" antiseptic varnish since the mercury compound is highly toxic.

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