MEDICINE

Find Fats in Vessels Of Atherosclerotics

➤ THE FATTY deposits that line the blood vessels of persons with atherosclerosis are not always the same, a team of Dutch researchers reports.

There are differences in the amount and kind of fat, or lipids, according to whether the lipid deposits appear in the aorta, the coronary arteries or the circle of Willis (the circular system formed by several cerebral arteries and the internal carotid or neck arteries).

Although the condition of the aorta is a guide to the progress of the disease, the scientists say in *Nature* (Jan. 3), atherosclerosis is "most liable to result" in dysfunction in the smaller arteries. With improved techniques for separating small amounts of tissue fats, the scientists report, they were able to analyze the composition of lipids from different blood vessels.

The coronary arteries have a high percentage of triglycerides compared with the aorta. The circle of Willis, in contrast, has a comparatively high content of cholesterol esters and an extremely low level of free cholesterol.

As a result of these studies, the scientists conclude, "theories concerning atherosclerosis based on observations of the aorta may have to take into account extra factors when they are applied to other arteries."

C. J. F. Bottcher, F. P. Woodford, C. Ch. Ter Haar Romeny, E. Boelsma and C. M. Van Gent, all of the department of physical chemistry, University of Leyden, The Netherlands, reported the research.

Science News Letter, January 17, 1959

MEDICINE

Scientists Disagree On Radiation Effects

➤ THERE IS STILL disagreement among scientists concerning the relationship between radiation dosages and the incidence of leukemia, according to a report delivered by a six-committee council.

A group of scientists reporting for the United Nations has agreed there is either a straight linear effect of radiation exposure or a "threshold" minimum dosage that will induce leukemia, or cancer of the blood, as it is sometimes called. The linear effect refers to a direct increase in damage to the blood as dosage increases.

But a six-committee council of the National Academy of Sciences-National Research Council on the biological effects of atomic radiation has suggested other relationships.

They propose that any leukemia induced by radiation is due to a number of variables, which may include either dose effect proposed by the U.N.

The committees said they were inclined to view many forms of cancer, including leukemia, as changes that arise through a more or less complex series of responses.

Knowledge to date is too incomplete to permit an accurate estimate of the number of cases of radiation-induced leukemia, bone cancer or other types of tumors, the six-committee report stated.

There is perhaps too great an impression created that leukemia is an inevitable result of radiation, neglecting the fact that leukemia develops in only a fraction of radiologists who are heavily exposed by occupation.

More and wider research, including compilation of data, will be necessary before any definite relationship can be determined, the committee members reported.

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BIOLOGY

See Success in Forecasts Of "Red Tide" in Florida

➤ SOON FLORIDIANS may be able to protect themselves against killer "Jim Brevis."

In outbreak years, a "red tide" of *Gymnodinium brevis*, or "Jim Brevis" as it is known to local residents, hits the West Florida beaches, causing huge losses to resort owners and fisheries.

A complicated formula using oceanographic and weather data may help forecast conditions needed for the explosive expansion of the microscopic plant-like organisms that kill millions of fish and fill the air with an irritating "gas."

Now it may be possible to predict the oncoming tide months in advance, Dr. F G. Walton Smith of the International Oceanographic Foundation, Coral Gables, Fla., said.

"Once the probable time of an outbreak is known," said Dr. Smith, "it probably will be possible to devise methods of poisoning the waters to prevent the organism's explosive expansion."

In one pint of sea water there have been found as many as 60,000,000 of the tiny plants—described as "a four-lobed blob of almost naked protoplasm with a whiplike flagellum trailing from one end."

Oval-shaped, pigment-carrying bodies within the plant give it color. Because of a slimy substance secreted from its surface, the plant turns water into a thin syrup when present in huge concentrations as in a red tide.

An irritating "gas" is also produced when the organism is present in large numbers. Samples of sea water from a red-tide outbreak were heated nearly to the boiling point. The vapor given off caused sneezing and coughing. The same effect is produced by small particles thrown into the air by breaking waves and remaining in suspension for some time.

Apparently an outbreak depends on precisely the right mixture of Gulf of Mexico waters with fresh water at just the right temperatures. When these occur, a red tide is likely to take place.

It will probably be necessary to include ocean tidal movements in the forecast formula before predictions can be entirely relied upon, Dr. Smith says in an article published in the annual report of the Smithsonian Institution.

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IN SCIEN

PUBLIC HEALTH

Radioactive Strontium In Milk Shows Rise

➤ LEVELS of strontium-90 in milk increased slightly during last September in eight of ten sampling stations, the Public Health Service has reported.

However, the increases were within the range of normal month-to-month fluctuations and well below the levels considered by the National Committee on Radiation Protection and Measurements to be permissible for human consumption.

The September count was highest at the St. Louis station, with 15.4 micromicrocuries per liter. A curie is equal to the amount of radioactivity produced by one gram of radium, and a micromicrocurie is one-millionth of a millionth of a curie. The Sacramento, Calif., station, with 3.8, had the lowest September count.

Of the other eight stations, the levels were up in Atlanta, Ga.; Austin, Tex.; Cincinnati, Ohio; Fargo, N. D.; New York, N. Y.; Salt Lake City, Utah; and Spokane, Wash. The other station reporting a decrease was Chicago.

The committee currently considers that a lifetime of exposure to strontium-90 at an average level of 80 micromicrocuries per liter is not expected to cause appreciable bodily injury to a human being.

Strontium-90 is one of the products released into the atmosphere during the explosion of nuclear weapons.

Average samplings at all stations for the 12 months ending September, 1958, showed the strontium-90 level ranged from 4.2 to 11.2 micromicrocuries.

The milk-sampling network also measures four other radioactive elements in milk: iodine-131, strontium-89, barium-140 and cesium-137. Levels for these elements have shown a generally variable pattern even further below the current permissible levels.

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GEOPHYSICS

Map Drawn Showing Underside of U.S.

➤ BY PLOTTING earthquake waves so long they drag on the bottom of the earth's crust, scientists at Columbia University and the California Institute of Technology have drawn the first generalized map of the underside of the United States.

It shows how this country would look if the top layers of earth and rock to a depth of about 20 miles, the earth's crust, were reversed. The bottom of the continental crust, the geophysicists found, mirrors the surface. It appears to have projections and depressions that in a general way reflect the larger topographic features of the land surface.

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CE FIELDS

METROLOGY

English-Speaking Nations Agree on Measurements

➤ A NEW VALUE for the international yard and pound have been adopted by the English-speaking nations. The revised definitions will become effective July 1, 1959.

The new international inch, derived from the international yard, is equal to 25.4 millimeters. The inch presently used by the National Bureau of Standards is equal to 25.4000508 millimeters. The new international yard equals 0.9144 meter.

The revised international pound is equal to 0.45359237 kilogram, compared with the presently used pound equal to 0.4535924277 kilogram.

Although these differences will have little effect on the day-to-day transactions with which most persons are familiar, the new definitions will be extremely important in the precise measurements of science and technology.

The directors of standards laboratories for the U. S., Canada, New Zealand, the United Kingdom, South Africa and Australia agreed to use the international units for all calibrations carried out by them after July 1.

The international inch is approximately two parts per million shorter than the inch presently used by the National Bureau of Standards, and somewhat less than two parts per million longer than the inch now used by the U. K.'s National Physical Laboratory.

The value of the international grain, a common unit in avoirdupois, apothecary and troy pounds, is 0.06479891 gram. There are 7,000 grains in the avoirdupois pound and 5,760 grains in both the apothecary and troy pounds.

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MEDICINE

Dyes Aid Treatment Of Throat Cancer

➤ BETTER METHODS in the surgical treatment of throat cancer may result from the use of dyes and radioactive solutions which serve as "pathfinders" for the surgeon's knife.

A research team at the University of California at Los Angeles Medical School has explored tissue pathways in the larynx in an effort to see how cancer spreads.

The larynx was demonstrated to consist of several isolated compartments with complete isolation, except for the surface mucous membrane, of one side of the larynx from the other.

When isotopes are injected into one side of the larynx a small portion enters the general circulation. The major fraction remains at the site of injection or in the regional lymph nodes. None appears in the uninjected side of the larynx.

These observations correspond to behavior of many larynx cancers in which enormous tumors occupy one side of the larynx without involvement of the other.

Results of the study may enable doctors to accurately predict the route of spread of cancer in the larynx. Thus the surgeon may be guided as to surgical procedures to be employed.

The team consists of Dr. Joel Pressman, Dr. Andrew Dowdy, Dr. Raymond Libby, Max Fields, Mildred B. Simon and Katherine Hand. The research is being supported by the U.S. Public Health Service.

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MEDICINE

Encourage Plant Research In Cancer Therapy

➤ SOME OF THE plants being grown in American gardens may be promising cancer fighters.

Research with some 96 plant extracts including 91 species indicate these naturally occurring compounds have "anti-cancer possibilities." This was reported to the University of Texas School of Medicine by Usha C. Dalal, Alfred Taylor and George F. McKenna of the University.

Extracts from 32 species inhibited the growth of egg-cultivated tumors 55% to 100% as compared with water-treated controls, the three researchers say.

Five species in the legume family, including the sweet locust and the white popinac, gave extracts which inhibited tumor growth 63% to 95%. The next greatest inhibition, 67% to 90%, came from the *Anacardiaceae* family which includes the pistachio nut tree. Extracts from the *Compositae* family inhibited tumor growth 55% to 70%. Plants tested in this group included the bur-marigold, plumed thistle, climbing hempweed and rosinweed.

Cherry palm, forsythia, cypress pine, soap berry, Japanese persimmon tree, and Indian or mock strawberry also yielded tumor-inhibiting extracts.

"None of the plant extracts processed to date have given results which promise practical application to cancer chemotherapy," the scientists warn. Some of the extracts are effective up to a certain extent, however, and need further attention.

Their data, they suggest, should encourage further work in this field.

As yet, the scientists point out, there is not a "single chemical agent which will completely inhibit the growth of or destroy tumor tissue without causing undue disturbances to nontumor tissue." Since plants have given potent medicines for other diseases, the researchers say, they may be useful in cancer therapy.

The full scientific report appears in the winter edition of *Texas Reports on Biology and Medicine* published by the University's Medical Branch.

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MEDICINE

Citrus Fruit Helps Football Players Ward Off Bruises

➤ ORANGES may help the football player become a great hero.

It seems that a combination of citrus fruit derivatives, hesperidin and vitamin C, combats the bruising a football player ordinarily experiences during a game. Dr. Thomas F. Dowd, attending physician to the Philadelphia Eagles, said the watchword in sports medicine must be to prevent injuries before they occur.

Dr. Dowd said he noticed professional football players became badly bruised during the course of a game. About 40% of players will show large bruises, 55% will show smaller bruised areas and the remaining five percent will escape bruising.

In sports, healing must be speeded as fast as possible, the physician pointed out. So he began experimenting with citrus fruit derivatives. Each player now takes three capsules of the derivatives a day.

There are now large bruise areas in less than five percent of the players at post-game examination, he said. No controlled physiological studies to confirm that the vitamin combination strengthens the capillaries have yet been done by the doctor. A bruise is essentially a mass of broken or damaged capillaries.

Dr. Dowd spoke during a symposium on Stress and Circulation sponsored by the Wayne County Academy of General Practice, Detroit.

Among other problems, the most serious were injuries to the knee joint involving ligament tears.

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ASTRONOMY

First Artificial Planet Now Lost for Many Years

➤ THE SOLAR system's newest planet, Russia's rocket "Mechta," is now lost for many years in the future. (See p. 37.)

The baby planet, known as an asteroid to astronomers, is much too small and faint to be picked up by earthly telescopes, even by the giant 200-inch reflector atop Mt. Palomar, when Mechta makes its closest approach to earth some 15 months hence.

The smallest asteroids now observable are about a mile in diameter. At closest approach to earth these faint points of light move so swiftly across the heavens that they can easily be missed. Because Mechta is so much smaller and, therefore, fainter, it is highly probable that the first artificial planet will also be lost, wandering unrecorded in space.

Improved observational methods might bring into view in the future considerably fainter objects than can now be photographed. However, the chances are still high that Mechta would be found, if at all, only by chance, because its orbit through space was not determined sufficiently accurately before its radio went dead.

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