

MEDICINE

Blood-Producing Vitamins

Riboflavin and the pellagra-preventive niacin are found to play a part in the manufacture and regeneration of the blood in the animal body.

➤ AT LEAST two vitamins of the B complex group, riboflavin and the pellagra-preventive niacin, appear to be factors necessary for the production and regeneration of the blood in the animal body, according to reports by two groups of scientists. (*Journal of Biological Chemistry*)

A stunting of the red blood cells that are constantly being produced by the blood-forming organs, and a consequent mild anemia, result from a synthetic diet containing all the known essential nutrients except riboflavin, Dr. C. A. Elvehjem and his associates of the University of Wisconsin found. This anemia, produced in dogs, is a direct result of the riboflavin deficiency and readily responds to a corrected diet containing adequate amounts of riboflavin.

Riboflavin is indispensable for normal growth and development. The results of these experiments therefore "suggest that in growing dogs there is a competitive need for riboflavin for growth and hemoglobin production."

It has also been suspected for some time that anemia, at least as found in pellagrins, is in some way associated with niacin deficiency. Dr. Philip Handler and Dr. William P. Featherston, of Duke University School of Medicine, show, apparently for the first time, that the anemia in pellagrous dogs is specifically due to this deficiency and can be corrected only by the administration

of adequate amounts of this vitamin. The red blood cells in this anemia are large but below normal in number and hemoglobin content.

The dietary and other factors that are known to be involved or helpful in the production of blood cells in the body, such as iron, protein, glucose, hemoglobin, the anti-pernicious anemia factor of liver extract, xanthopterin and excessive amounts of cobalt, were without effect when administered to the pellagrous and anemic animals. They were successfully treated, however, with niacin.

Mature red blood corpuscles are not true cells since they do not have nuclei. In the early formative stages, however, they do have nuclei. It is the theory of the Duke physiologists that niacin is necessary for the proper production and maturation of these blood cells. This vitamin is known to play an important role in the respiration of all cells of the body. The lifetime of blood cells appears to be very short and the rate of turnover is quite rapid. Consequently the requirements of niacin for the manufacture of blood cells might be correspondingly great. A niacin deficiency, besides producing the usual symptoms of pellagra, might also lead to anemia because of the inadequate supply of this vitamin for development of the red blood cells in the early stages.

Science News Letter, February 12, 1944

CHEMISTRY

Plastic Car Tires

➤ PLASTIC TIRES for automobiles may take a place side by side with natural and synthetic rubber tires in post-war days. The same new plastic is suitable for making garden hose so light that the wife may drag it around with ease as she waters the lawn, her feet being protected from dampness at the same time by shoes with soles and heels of the same material. These and many other uses are possibilities of a new plastic recently developed in the Goodyear Research Laboratory.

An automobile tire made of this new

plastic stood up well in an 8,000-mile road test. During these tests the carcass and treads of the tire reached maximum temperatures only slightly higher than those reached in tires of natural rubber, and much below that developed in tires of the Buna S type of synthetic rubber. The tire was made with the standard equipment used to make natural rubber tires. The plastic can be handled in hot molds like natural rubber. It is claimed to be the first elastic plastic capable of being vulcanized during molding oper-

ations. Unlike natural rubber, this plastic is not affected by the rays of the sun.

The basis of this new plastic is a copolymer of vinylidene chloride and vinyl chloride. There are a great number of so-called vinyl plastics now in use. The starting point of them all is ethylene obtained from petroleum. By chemical reaction vinyl chloride, vinyl acetate or other vinyl compounds are obtained from the ethylene. By another process some of them may be polymerized; this means that their vinyl molecules may be put together to form giant molecules not un-

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like those of natural or synthetic rubber.

In the manufacture of this new plastic, which may become a successful rubber substitute in tires, the polymer is mixed with a plasticizing agent in the usual

way, but with a curing agent added which makes vulcanizing possible. It then has twice the tensile strength of the uncured product.

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PHYSICS

Pitch Radioed at Night

Pure A above middle C may now be checked in evening with the 2,500 kilocycles per second frequency broadcast service of the National Bureau of Standards.

➤ MUSICIANS and manufacturers who want to check pitch can now tune in during the night with their shortwave sets to 2,500 kilocycles and get a musical sound guaranteed by the National Bureau of Standards to be pure 440 cycles per second, which is A above middle C in the musical scale. This radio frequency, 2,500 kilocycles per second, at night, is an addition, effective since Feb. 1, to the standard frequency broadcast service of the Bureau.

Since the same date, the pulse on the 59th second of every minute has been omitted. This government service, continuous day and night, broadcasts standard frequencies and standard time intervals from the Bureau's radio station near Washington, WWV. It makes the national standard of frequency widely available. This is of value in scientific and other measurements requiring an accurate frequency.

The Bureau's standard frequency broadcast service includes standard radio frequencies, standard time intervals ac-

curately synchronized with basic time signals, standard audio frequencies and standard musical pitch.

At least three radio carrier frequencies will now be on the air at all times to insure reliable coverage of the United States and other parts of the world. Two frequencies, 5,000 and 10,000 kilocycles per second, are on continuously day and night. A 15,000 kilocycles-per-second frequency is on the air from 7:00 a.m. to 7:00 p.m., with the additional frequency to be used, 2,500 kilocycles per second, from 7:00 p.m. to 9:00 a.m.

Two standard audio frequencies, 440 cycles per second and 4,000 cycles per second, are broadcast on the radio frequencies of 5,000, 10,000 and 15,000 kilocycles. The audio frequency 440 cycles only is broadcast on the 2,500 kilocycles. The 440 cycles per second is the standard musical pitch; the 4,000 cycles per second is a useful standard audio frequency for laboratory measurements.

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ASTRONOMY

Star "Playing Catch"

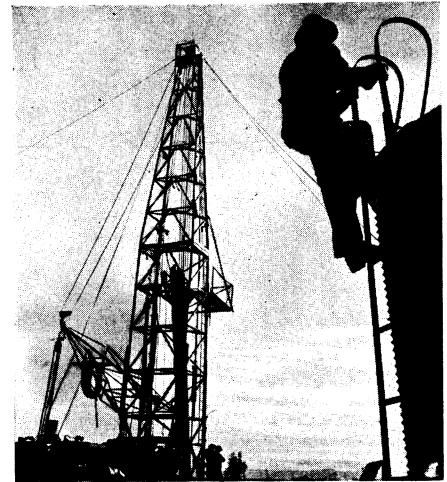
Appears to be tossing part of its own atmosphere far out into space, clear around its companion, and recovering some of the flaming gases on its return trip.

➤ A STAR that appears to be "playing catch" with itself, tossing a part of its own flaming atmosphere far out into space, clear around its companion in a double-star team and recovering part of it on its return trip, is described by Dr. Otto Struve of the Yerkes Observatory.

The star is a rather faint double one, designated by astronomers as SX Cassiopeiae. Cassiopeia is the constellation landmarked by the great W-shaped group of stars on the opposite side of

the Pole Star from the Great Dipper.

As Dr. Struve pictures the phenomenon, a stream of gas issues from one member of the double-star team and divides on the far side of the second member. Part of the stream flows off into space, while part circles around the second star and returns to rejoin the atmosphere of its parent star. Some tenuous, absorbing cloud of gases acting in this manner would explain the peculiar variations observed in the case of SX Cas-



ARCTIC OIL—To help supply oil and gasoline for the U. S. and Canadian armed forces in the Alaskan zone, oil wells such as the one shown above, are being tapped at Fort Norman, 125 miles south of the Arctic Circle on the Mackenzie River. The joint U. S. and Canadian government development is known as the Canol project, Canol standing for Canadian Oil.

siopieiae, Dr. Struve states. (*Astrophysical Journal*, January)

A powerful stream of cool but rapidly moving gas flows out from the G star toward its companion. One part of the stream, presumably composed of the more distant or more rapid strata, expands outward and leaves the system. The other part flows around the A star, and having become hotter, but traveling more slowly, ultimately returns to the G-type star, Dr. Struve believes. It is not possible to see this streaming action, but spectroscopic studies make this the most plausible picture.

The stream of ionized metals such as calcium and iron flows at a height above the surface of the A star about equal to the star's diameter.

"The most interesting feature of SX Cassiopeiae is the observation of an approaching shell at and near secondary eclipse," the Yerkes director states. "These motions are plausibly attributed to the turning over of the stream due to conservation of angular motion. Only a part of the stream is retained by the system and completes the entire circuit around the A star."

The spectrum of this eclipsing double star is a blend of a true star of the G type, to which class the sun belongs, and lines of another origin which re-