

CHEMISTRY

New Vitamin In B Group Suspected By Health Service

Chemical Preventing Functioning of Bacteria in Intestines Seems Also To Hinder Synthesis of Vitamin

BY AS smooth a bit of sleuthing as ever issued from Sherlock Holmes' Baker Street headquarters, research scientists of the U. S. Public Health Service are pointing toward what appears to be a new, and hitherto unsuspected vitamin in the all-important B group, of which six vitamins necessary for rats are known to exist.

First hint of the existence of a seventh B vitamin, needed by rats, came from other researchers. These scientists found that rats fed on a diet containing other necessary vitamins plus the six known B vitamins and a sprinkling of the drug, sulfaguanidine, failed to grow normally. The sulfaguanidine in this case simply prevented the functioning of bacteria normally present in the intestines. These bacteria, the researchers suspect, synthesize the seventh B vitamin. That was stopped by the sulfaguanidine and so the rats failed to grow. Since the other vitamins necessary for growth were provided by the diet, and the six B vitamins were supplied too, it appeared that the growth failure was due to a missing No. 7 B vitamin.

Now comes an additional clue from the laboratories of the Public Health Service at the National Institute of Health, Bethesda, Md. Dr. Floyd S.

Daft, Dr. L. L. Ashburn, Dr. Samuel S. Spicer and Dr. W. H. Sebrell have discovered that seven young rats fed on a similar diet plus sulfaguanidine developed hyaline sclerosis.

Hyaline sclerosis, or hardening of the arteries, is an all too common disease of humans. Its causes are far from clear. The walls of the blood vessels are often completely replaced by a glassy material, and normal functions seriously impaired.

When the Public Health Service men discovered the sclerosis they instantly suspected that once again the sulfaguanidine had stopped the normal intestinal production of the needed No. 7 B vitamin. Again the other necessary vitamins had been provided, plus the six B vitamins—thiamin, riboflavin, pyridoxine, pantothenic acid, nicotinic acid, and choline. It appeared that the damage was done by the absence of No. 7 vitamin.

Whether the sclerosis is due to a shortage of the seventh B vitamin necessary for rats or to some poisonous action of the sulfaguanidine is not yet clear. The Public Health Service men hope the drug will be ruled innocent by further research. If so, a new member may be added to the vitamin B family.

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Even at this extreme pressure, graphite refused to change to diamond, and Dr. Bridgman believes that this feat, which Nature herself accomplishes so sparingly, cannot be done at ordinary temperatures, no matter how high the pressure.

More than boiling hot ice was produced at a much lower pressure. At 40,000 atmospheres, ice was produced at a temperature of approximately 375 degrees Fahrenheit. This is 163 degrees above the usual boiling point of water, nearly as far above it as the boiling point is above the freezing point.

Hot ice is indeed not ordinary ice, but it differs from the latter practically only in that its volume is less; it sinks in water, and its melting point is raised with increasing pressure, contrary to the behavior of ordinary ice. This explains why it does not melt at high temperatures if the pressure is sufficiently raised.

Six of these other kinds of ice emerge at different pressures. Nearly all substances behave in the same way. Eleven kinds of solid camphor, six kinds of bismuth, appear as these substances are compressed.

Physical properties change remarkably. Poor conductors of electricity become fair conductors, and good conductors become sometimes better, sometimes worse.

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MATHEMATICS

Einstein's Predictions Derived by Mathematician

FFROM Einstein's special relativity theory, Dr. George D. Birkhoff of Harvard has derived the famous values for the change in the planet Mercury's perihelion and the curvature of light passing by the sun. These predictions were first made by Einstein on the basis of his general relativity, which followed his special relativity theory by some years. Their experimental confirmation enthroned relativity as a dominant law of the universe.

Dr. Birkhoff announced his success to the Inter-American Astrophysical Conference held under the auspices of the Mexican government. He urged scientists to give consideration to Einstein's special and general theories of relativity in relation to quantum mechanics.

Dr. Birkhoff also recalled that in 1926 he had demonstrated that Schroedinger's quantum mechanics could be derived from general relativity, which was another bringing together of fundamental conceptions in theoretical physics.

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PHYSICS

Boiling Hot Ice Is Produced By Extremely High Pressures

HOW boiling hot ice and other weird things occur at extremely high pressures was told by Dr. P. W. Bridgman, Hollis professor of mathematics and natural philosophy at Harvard University. He spoke at Iowa State College under the auspices of the Sigma Xi, national fraternity for the promotion of scientific research, and will give the Sigma Xi lecture at a number of other colleges and universities during the next few weeks.

Dr. Bridgman also described the steps by which pressures in his laboratory have been successively raised from a previous high of 3,000 atmospheres or 45,000 pounds per square inch, the maximum employed in artillery, to the present record of 400,000 atmospheres. This is 6,000,000 pounds per square inch, the pressure that would be found under a tower of bricks nearly 1,500 miles high, or at a point in the interior of the earth over 1,000 miles below the surface.