BIOCHEMISTRY

Evolution Loses Enzyme

➤ SOMEWHERE along the path of evolution between rabbits and man, a particular liver enzyme disappeared. Loss of this enzyme is the reason man is unable to manufacture vitamin C within his own body, a team of researchers from India has reported.

Drs. I. B. Chatterjee, N. C. Kar, N. C. Ghosh and B. C. Guha of the University College of Science and Technology, Calcutta, reported at a New York Academy of Sciences conference that the chemical conversion of sugar to vitamin C (L-ascorbic acid) in animals is completed only when the enzyme L-gulono-oxidase is present.

In amphibians, reptiles and a number of birds, this enzyme is found within the minute particles (microsomes) embedded in kidney cells. But in other birds and in those mammals capable of manufacturing vitamin C, the enzyme has moved to the liver cells. Finally, in the higher mammals, and in at least one bird, the enzyme disappears completely.

All this indicates, the researchers state, that "in the evolutionary ascent," the enzyme originally residing in the kidney gradually passes into the liver and finally by genetic effect, disappears from the liver also.

In mice, rats, rabbits, pigeons and chickens, but not in goats, a natural substance cuts down on the amount of vitamin C produced. This substance can be overcome by vitamin K, and by the chlorides of lithium, sodium, potassium and cesium.

Vitamin C production in rats also can be increased by certain drugs, Drs. A. H. Conney, George A. Bray and J. J. Burns of the National Heart Institute, Bethesda, Md., reported at the same meeting.

Among the active agents are certain hypnotics, painkillers, muscle relaxants, antirheumatics, antihistiminics and cancer-producing agents. The action of these drugs the NHI team believes, increases the metabolism of sugar and stimulates the liver microsomal enzymes that metabolize drugs.

Research indicates that some of the drugs and vitamin C reciprocally take part in building up and tearing down each other.

• Science News Letter, 78:261 October 22, 1960

BIOCHEMISTRY

Plant Growth Regulators Give Animals Fits

➤ THE PLANT GROWTH regulators have invaded the animal world and the animals literally are having fits, three French researchers report.

A small amount of one particularly active chemical dropped into a fish bowl causes goldfish to have convulsions and also brightens up their color. The myna fish, a European relative of the goldfish, behaves in the same manner.

In the Siamese fighting fish, ordinarily a peaceable creature until another male of the same species appears, the chemical can work the male into a pugnacious lather even when there is nothing around to fight. Just as if the enemy were really there, the fish puffs up its fins and brightens by expanding the color cells in its skin.

The researchers, Dr. J. Thuillier of Saint Anne Hospital, Paris, and Drs. P. Rumpf and Germaine Thuillier of Research and Study Center of Applied Organic Chemistry, state in Nature, 188: 152, 1960 that the action of the growth regulator chemicals is to stimulate the central nervous system, probably in the region of the hypothalamus.

The particular substance used in their tests, an ester of para-chlorophenoxyacetic acid, does stimulate the hypothalamic area.

• Science News Letter, 78:261 October 22, 1960

TRACKING TUMBLING—A new two-foot-long device, developed by the Raytheon Company, is demonstrated by engineers Andre Krutchkoff, left, and Wesley Haywood, who are tracking Echo I. The instrument was unveiled at Jupiter, Fla., during a meeting of tracking station experts of the Smithsonian Astrophysical Observatory's world-wide tracking network.

ROCKETS AND MISSILES

World TV Via Satellites Set at $170,000,000

➤ FIFTY IMPROVED COURIER-TYPE communications satellites would provide world-wide telephone and television facilities for a mere $170,000,000: $100,000,000 for the satellites and $70,000,000 for the ground stations.

These are the figures the American Telephone and Telegraph Company estimated for the Federal Communications Commission in Washington, D. C. Without the luxury of television facilities, the telephone system alone would cost only $115,000,000.

AT&T also estimated the cost of an economy system to link America, Europe and Hawaii with 30 active repeater satellites. The price for 600 telephone circuits and a two-way TV channel: $82,000,000.

But Charles M. Mapes, assistant chief engineer for AT&T, pointed out to the FCC that the cost of the latest and most efficient undersea cables now being designed is "substantially more per circuit than the indicated cost for satellite communication and this cable cannot carry transoceanic wide-band television."

• Science News Letter, 78:261 October 22, 1960

ROCKETS AND MISSILES

New Method Pinpoints Satellite's Position

➤ A HIGHLY ACCURATE method of pinpointing the position of a satellite or missile when it is thousands of miles from the earth has been developed by scientists at the Boulder Laboratories of the National Bureau of Standards in Colorado.

An existing chain of ground stations would be used to receive a radio signal from a satellite or other space vehicle at four or more points on earth. The position of the satellite would be computed from the difference in the signal's time of arrival at each of these points.

This new method of space navigation is most effective when the space vehicle is a few hundred miles to several thousand miles from the earth's surface. Conventional techniques are more accurate closer to earth.

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