

## BIOCHEMISTRY

# Omnipresent "Pantothenic" Acid is Stimulus to Growth

Found in All Plant and Animal Substances, It Speeds Cell Division Ten to Twenty Thousand Fold in Few Hours

**A**LL LIFE may involve the presence of a powerful growth-stimulating acid which has been found in many different kinds of plants and animals and has been concentrated by Dr. Roger J. Williams and Carl M. Lyman, of Oregon State College, to a potency one thousand times stronger than any previously reached.

Because of the widespread occurrence of this little-known substance Dr. Williams, who reported his latest researches to the American Chemical Society, has tentatively named it "pantothenic" acid from the Greek for "from everywhere." The name is justified by tests which show that pantothenic acid was obtained from all sources examined so far which include: cattle, human and chicken liver, milk, crab eggs, sea urchin eggs, planarian worms, earthworms, oysters, bacteria, molds, yeast, mushrooms, potatoes, apples, grains, algae and soil.

"It is probably safe to say that this acid is more widely distributed in nature than any other physiologically potent substance," Dr. Williams declared. "The evidence shows that it is contained in all living substances from the highest mammalian form down to the lowliest worm and from the highly developed green plant down to the tiniest yeast, mold or bacteria.

"The acid was discovered because of its effect on yeast growth," he continued. "When placed in a solution in which yeast is growing it may increase the rate of multiplication from ten to twenty thousand fold in eighteen hours. The fact that it is apparently present in all living cells suggests that it may act as a growth regulator in all cells. It is interesting to observe that yeast and mushrooms, which proverbially grow rapidly, are comparatively very rich sources of the acid."

As recently concentrated by Dr. Williams and his associate, pantothenic acid is so potent in speeding up the growth of yeast that a quantity much smaller than the head of a pin has a detectable

effect when placed in 250 gallons of solution in which yeast is growing. The presence of one part of the preparation in one billion parts of yeast culture medium is noticed by the resulting growth increase.

"While the origin of this acid in nature is obscure, except for the fact that it is produced by certain molds in soils, for example," Dr. Williams explained, "we are led to suspect that it is one of the unidentified water-soluble vitamins. In fact, several of its properties at first suggested a close relationship to vitamin G; yet unlike the widely known vitamins it appears to be a substance that even plants cannot make for themselves, but must obtain directly from the soil."

Dr. Williams' present work grew out of studies of the many practically unknown substances that stimulate yeast growth and carries on a detailed examination of one of the more simple of these materials. It is the acid constituent, he found, of the previously widely heralded "bios," a hypothetical substance thought necessary to life. Though the chemical formula of pantothenic acid has not been determined, something is known concerning the structure of its molecule. Its molecular weight has been found to be about 150.

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## PSYCHOLOGY

## Consistency Found in Errors of Judgment

**E**RRORS made by the brain are the clues pursued by one psychologist. Dr. George Kreezer, of the Vineland Training School, in research conducted at Berlin, discovered a certain consistency in errors of perception.

If you see a light of a certain intensity, and again, a few seconds later, see a light of exactly the same intensity, you will probably judge the second light to be brighter than the first.

If you see a light a little to your left

and then another of exactly the same intensity a little to your right, you will judge the left light to be brighter. Some persons—and they may be those with a tendency to lefthandedness—are exceptions and consistently judge the right to be brighter.

If you hear a tone at your left and then another of exactly the same intensity at your right, you will judge the right tone to be louder—you will, that is, if you are one who judged the left light to be brighter. If you are one who sees the right light as brighter, you will hear the left tone as louder.

Thus errors of hearing are consistent with—although opposite to—errors of vision. Yet each type of signal comes to the brain through separate sense organs and over separate networks of the brain's telegraph wires, the nerves.

These perception errors are not due to differences in the sense organs. Neither are they a matter of the nervous pathways to your brain. That has been established. They depend upon the brain itself. They indicate that a certain organization must exist in the brain which in some respects at least conforms to the space-time organization of the material world outside the self, and helps us to account for our perception of that world.

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### WANTED: WINTER APARTMENT

As autumn advances, many species of spiders abandon their webs, join the ranks of the hunting spiders that never make webs, and seek quiet dark corners where they can hibernate. That is why the distressed housewife often complains of "spiders all over the place" at this time of the year. Cornelia Clarke's camera here gives us a close-up of one of these autumnal house-hunters, a black spider. So good is the enlargement that it is easy to see six of the eight eyes possessed by the lady (most of the male spiders were eaten by their wives, weeks ago), and a little closer examination will disclose the other two.