

BIOCHEMISTRY

Hallucination Snuff Yields New Alkaloids

► SNUFF from tree seeds was used by pre-Columbian Indians for the purpose of producing hallucinations.

Modern efforts to identify the chemicals responsible for these weird effects on the senses have yielded new information on how the body breaks down the chemical tryptophan, the American Chemical Society meeting in Dallas, Tex., was told.

Reporting on work by Drs. E. C. Horning and M. S. Fish of the National Heart Institute, Bethesda, Md., Dr. Horning said three authentic samples of "yopo" or "cohoba" snuff had been analyzed.

The powerful stimulant principle is said to come from seeds of *Piptadenia peregrina* and *Piptadenia macrocarpa* trees and to belong to the chemical family of the alkaloids.

One of the samples of snuff was brought from Brazil in 1882. The others are more recent, one from Venezuela in 1949, the other from Colombia in 1954-1955.

Analysis involving the chemical breakdown of the unfamiliar alkaloid along the expected lines of utilization of similar compounds by the body showed a pattern of occurrence of indole bases that led the Heart Institute chemists to suggest they have found in this material a new route of tryptophan metabolism.

Indole alkaloids show a variety of unrelated effects on the body, Dr. Jurg A. Schneider, CIBA Pharmaceutical Products, Inc., Summit, N. J., reported. Some lower blood pressure and heart rate, others have the opposite effect. Indole itself is necessary for production of protein, Dr. Schneider explained.

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NUTRITION

Monkey on Egg Diet Has Heart, Artery Damage

► A MONKEY with a strong liking for eggs ended up with heart and artery damage and a skin ailment as a result of eating too many eggs, Dr. George V. Mann of the U.S. Public Health Service laboratories in Framingham, Mass., and Dr. Stephen B. Andrus of Harvard School of Public Health, Boston, reported at the meeting of the Federation of American Societies for Experimental Biology in Atlantic City, N.J.

The monkey, bought in India, was brought to the United States and raised as a household pet until it became too unpredictable and dangerous to handle. It was obtained by the Harvard School of Public Health from an animal dealer.

In the nutrition laboratories, the monkey refused to eat conventional experimental diets. A special diet, composed mostly of dried egg yolks with added pure cholesterol, minerals and vitamins, was found to be to the monkey's liking.

After three and a half years on the diet

the animal's blood had a high fat, or cholesterol, content. Yellowish patches and nodules appeared on the monkey's hands, feet, elbows and buttocks, like the xanthomatosis of humans. At this time the monkey showed no signs of heart disease.

The animal was sacrificed at this point. Examination revealed extensive damage in the heart and blood vessels.

"Even the blood vessels in the brain were involved," the scientists said, "a finding that is unusual in experimental animals, but common in human subjects.

"The skin nodules were entirely like those seen in people with xanthomatosis.

"Altogether, this seems to indicate that the quality of diet does have something to do with the development of excessive fat levels in the blood, and with the vessel and skin changes of xanthomatosis."

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TECHNOLOGY

Chemical Rain Repellent Eliminates Wipers on Jets

► A CHEMICAL RAIN REPELLENT that eliminates mechanical windshield wipers was demonstrated to the American Chemical Society meeting in Dallas, Tex.

Designed for high-speed jet aircraft, the repellent is made of silicones and a combination of natural and synthetic waxes. The coating is applied to the windshield in two steps that take about 15 minutes. It will last for several days of heavy rain, after which the windshield is recoated.

Although primarily designed for military aircraft, the repellent has commercial value and will be used soon by United Air Lines.

The chemical rain protector sets up a hard coating on the window pane that makes rain roll off like heavy beads of mercury.

It is not adaptable for automobiles, because of the slow speed of cars, but may have further application to eliminating salt spray encrustation on speed boats.

The repellent is the result of four years of research by chemists of Foster D. Snell, Inc., New York, for the Navy Department's Bureau of Aeronautics.

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ICHTHYOLOGY

Gobius Fish Is A Real Swell

► A *GOBIUS BIBARBATUS* fish that can swell up so much its scales slide apart was recently discovered in South Africa.

Other fish expand when an enemy approaches, but this is the first discovered that threatens to split its sides in the process.

The ability to swell is a primitive but effective defense for fish world, since it makes the fish too big to be swallowed.

The South African find is the first *Gobius* known to expand, J. L. B. Smith of Rhodes University, Grahamstown, South Africa, reports in *Nature* (April 14).

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IN SCIEN

PUBLIC HEALTH

Smog Chemicals Cause Lung Cancer in Mice

► CHEMICALS found in smog have for the first time been successfully used to induce lung cancer in mice breathing air containing the chemicals.

The experiments by Drs. Paul Kotin and Hans L. Falk of the University of Southern California and Los Angeles County Hospital were announced by the American Cancer Society which, with the U. S. Public Health Service, supported the research.

The findings, the cancer society points out, "tend to broaden considerably science's search for environmental factors responsible for the steady rise in cancer morbidity (sickness) and mortality rates. The findings suggest that precautions be taken against unnecessary exposure to the chemicals."

The compounds are oxidation products of aliphatic hydrocarbons. The molecules are built upon a skeleton of carbon and hydrogen atoms in a straight chain, a branched chain or a cycle. Their sources include gasoline, diesel oil and most plastics.

The type of cancer induced in the mice who breathed the chemicals attacks human lungs but is not the type of lung cancer that has been rapidly increasing recently.

Dr. Kotin thinks that, in humans, atmospheric irritants interfere with or exhaust the mechanisms that normally clear the lungs of foreign material. Cancer-producing chemicals may then localize and accumulate in the lungs.

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ARCHAEOLOGY

Egypt's Pharaohs Have Modern Parallels

► THE SUPERHUMAN deeds attributed to Pharaohs in the "records" of ancient Egypt have their parallels in America today, Dr. John A. Wilson, egyptologist of the University of Chicago, pointed out at the American Philosophical Society meeting in Philadelphia.

Americans, too, can pass over prosaic fact in favor of the myth that glorifies, he said. It shows up in the tall tales of Paul Bunyan, Davy Crockett and other myths of the American frontier.

The art of ancient Egypt is analogous to the Pharaoh myths. The art shows that the "portrait" of an individual Egyptian was present, but it was overlaid with an idealization of ever youthful vigor.

To the Egyptian, the belief in man's immortality was more important than slavish fidelity of characterization.

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CE FIELDS

GERONTOLOGY

Age Cuts Down Lung's Air Capacity

► WHY OLDSTERS and even middle-aged men and women get winded easily was explained by Drs. Arthur H. Norris, Nathan W. Shock, Milton Landowne and Joseph A. Falzone Jr. of the National Heart Institute's section on gerontology in Baltimore at the meeting of the Federation of American Societies for Experimental Biology in Atlantic City, N. J.

With aging, these scientists found, more of the lung capacity is given over to fixed immovable air and less to mobile air that can be inhaled and exhaled. This is the aging change chiefly responsible for decline in breathing capacity up to age 50.

After age 50, the decline is due more to slow-down in the maximum breathing rate.

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BIOCHEMISTRY

See Cancer Weapons In Two Chemicals

► CHEMICAL WARFARE against cancer is advanced by two new chemicals, which have been tried in animals, and one in a few human cases.

One is a counterfeit of a protein-building amino acid called TA, short for B-3-thienylalanine. It was synthesized by Dr. Karl Dittmer of Florida State University.

Drs. Edgar C. Bristow 3rd and Robert W. Wissler of the University of Chicago and the Argonne Cancer Research Hospital, Chicago, find it a "gentle drug," which can be taken by mouth and which slows down the growth of transplanted rat tumors.

A widely used flavoring agent, monosodium glutamate, and a very poisonous, flammable and explosive gas, diazomethane, have been used to synthesize the other hopeful chemical against cancer, called D.O.N.

D.O.N. is short for 6-diazo-5-oxo-L-norleucine. Scientists at Sloan Kettering Institute for Cancer Research, New York, found it "30 times more effective in the control of tumors in mice than is azaserine." Azaserine is an antibiotic, or so-called mold remedy, tried earlier as an anti-cancer remedy in experiments by the Sloan-Kettering group.

D.O.N. was synthesized by scientists at the Mellon Institute, Pittsburgh, and at Parke, Davis and Company, Detroit, and was also produced by fermentation methods by scientists at the Detroit firm. It was reported at the meeting of the American Chemical Society in Dallas.

"The basis for hope that D.O.N. may prove useful in the treatment of some

types of tumors lies in the finding that, as well as inhibiting the mouse tumor, the product has been found to inhibit a fundamental biochemical process, the formation of nucleic acids from smaller chemical fragments," scientists reporting D.O.N. said.

The Sloan-Kettering scientists are Drs. Donald A. Clarke, H. Christine Reilly and C. Chester Stock. Synthetic work at Mellon Institute was done by Horace A. Dewald and Alexander M. Moore. Eighteen Parke, Davis scientists aided in the research.

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BIOCHEMISTRY

Leukemia Virus Find May Yield Mouse Vaccine

► DISCOVERY of a virus that for the first time consistently causes leukemia in adult as well as infant mice was reported by Dr. Charlotte Friend of Sloan-Kettering Institute for Cancer Research, New York, at the meeting of the American Association for Cancer Research in Atlantic City, N. J.

The finding will make it possible to study immunization against the disease by vaccination of animals with the virus.

The discovery pertains only to mice, Dr. Friend cautioned, and does not indicate that human leukemia is a virus disease. Being able to study the physical and chemical characteristics of leukemia in animals, the expected first result of the finding, may, however, lead to better knowledge for fighting human leukemia.

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BIOCHEMISTRY

Chemistry of Vision Little Changed by Time

► THE CHEMISTRY OF VISION has changed little or not at all down through the ages, from ancient creatures to man.

Dr. Frederick Crescitelli, University of California at Los Angeles zoologist, has identified rhodopsin, man's visual purple pigment related to vitamin A-1, as the primary visual pigment of the lamprey, one of the most primitive living vertebrates.

The lamprey is a link between invertebrates and higher vertebrates, including frogs and man. Porphyropsin, related to vitamin A-2, had previously been thought to be the lamprey's primary visual pigment.

This discovery seems to clarify the evolution of the chemistry of vision. Vitamin A-1 is a constituent of invertebrates and is probably related to their visual pigments, Dr. Crescitelli said. The supposition that the lamprey's primary visual pigment was porphyropsin had indicated a biochemical break between invertebrates and vertebrates.

Dr. Crescitelli's research suggests that rhodopsin is the original vertebrate visual pigment; that there is no biochemical break between invertebrates and vertebrates but a direct line, and that porphyropsin, found in fresh water fish, is probably an offshoot from the main evolutionary line.

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PSYCHOLOGY

Successful Air Force Pilots Are Well Liked

► THE SUCCESSFUL Air Force pilot turns out to be a well-rounded "good Joe," two Air Force scientists told the Aero Medical Association meeting in Chicago.

Studies of combat and training data show the successful combat pilot is courageous, fair with others, willing to accept his share of combat duty, responsible, a disciplinarian when needed, and well adjusted.

"Above all, he is liked by all who come into contact with him," Drs. David K. Trites and Albert L. Kubala of the USAF School of Aviation Medicine at Randolph Air Force Base, Texas, said.

The successful pilot, they reported, is also usually the more competent pilot and is more easily trained and is "not unduly concerned with self-advancement."

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BIOCHEMISTRY

Isolate Contraction Chemical From Muscle

► A CHEMICAL muscles must have to contract when they work has for the first time been isolated and crystallized from muscle tissue.

It is called myokinase, and its isolation was announced by Lafayette H. Noda and Stephen A. Kuby of the University of Wisconsin at the meeting of the Federation of American Societies for Experimental Biology in Atlantic City, N. J.

Existence of myokinase has been known since 1943. It is an enzyme chemical that helps make energy available to the muscles for work, acting on chemicals in which the energy is stored.

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MAMMALOLOGY

Cat Lives to Older Age Than Other Pets

► CATS with their fabled "nine lives" do have the longest life span of popular household pets, reports British zoologist Alex Comfort of the University College, London.

Surveying authentic cases of old age in cats, Mr. Comfort found that "the cat would appear to be quite the longest-lived of the smaller domestic animals, its maximum age just under 30 years." This compares with 18 to 20 years reported for terriers and 15 to 18 years for large hybrid rabbits.

Old cats are strikingly better preserved than dogs in terms of persistence of teeth, activity, hunting and grooming, Mr. Comfort states. The oldest female in his records, 31 years old, was said to have been "in kitten" at 26. Mating continues throughout life with some of our oldest male cats, Mr. Comfort reports in the *Journal of Mammalogy* (Feb.).

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