

CHEMISTRY

Pollen Chemical Causing Hay Fever Is Identified

► THE SINGLE chemical agent that causes hay fever has been extracted from ragweed pollen and identified, scientists at the American Chemical Society meeting in San Francisco learned.

Identification and study of the agent responsible for hay fever is expected to make possible more effective relief for the millions of persons who suffer the summer-time allergy.

Trifidin A, as the agent is called, was separated from extracts of giant ragweed pollens by Drs. A. K. Bhattacharya and A. R. Goldfarb of the Chicago Medical School.

The substance by itself has proved almost as effective in producing hay fever as the total pollen extract, Dr. Bhattacharya said. It may exist uncombined in the pollen, he reported, or it may be hidden in a complex mixture of other pollen components.

Ragweed pollens are a major cause of hay fever and asthma, which are the most common constitutional allergy symptoms found in the United States. Previous studies of these widespread conditions indicated the presence of several substances which singly, or in combination, can produce the allergies.

Earlier work also showed that the allergy-producing agents could be separated into two categories: those that react with skin and those that do not. This, Dr. Bhattacharya said, confirmed the belief that the agent producing allergy symptoms is a single chemical structure occurring either in the free state or combined with carriers as a complex compound.

Separation of the compound Trifidin A was accomplished by repeated treatments of the pollen extract with solvents, followed by ion exchange and chromatographic refining.

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BIOLOGY

Fake Body Chemical Gives Anti-Cancer Hope

► COUNTERFEIT "hearts" of nucleic acid, the material that guides a cell's function and controls its heredity, have been synthesized and may show promise as potential anti-cancer drugs, the Federation of American Societies for Experimental Biology meeting in Philadelphia learned.

The story of how these "hearts" or nucleosides, as they are called, have been made in the laboratory was described by Dr. Jack J. Fox of Sloan-Kettering Institute for Cancer Research, New York.

Transplanted tumors have been fooled into destruction by a "phony" nucleoside in laboratory animals, Dr. Fox told SCIENCE SERVICE.

The synthesizing of the chemically complex nucleoside by the New York scientist and his co-workers is in itself a major scientific advance. For the first time, it permits scientists throughout the world to

make up many of the body's naturally occurring nucleosides simply and cheaply by following a chemical recipe.

Dr. Fox said that the new method of synthesis already has made available the rare nucleoside, 5-methylcytosine deoxyriboside, and has yielded the fraudulent nucleoside, "thio-guanosine."

Thio-guanosine has been effective against a wide variety of experimental tumors, according to other researchers at the Sloan-Kettering Institute. As synthesized, it is a fraudulent nucleoside that differs from its natural counterpart, guanosine, by having had only one of its many atoms changed.

This small change is crucial to applying "phony" nucleosides as a weapon in the fight against cancer. The hope is that by giving an animal a counterfeit nucleoside, it will interfere with cell function. This hope is aimed at influencing malignant cells within the body, but without unduly affecting normal cells.

Dr. Fox's co-workers at Sloan-Kettering included, Dina Van Praag, Iris Wempfen, Iris L. Doerr, Loretta Cheong, Joseph E. Knoll, Maxwell L. Eidinoff and Aaron Bendich.

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BIOLOGY

Greater Leukemia in Mice at Lower Altitude

► MALES are more susceptible to spontaneous leukemia at low altitudes than at high altitudes, at least in mice.

This was shown in a study made in Peru and reported to the American Association for Cancer Research meeting in Philadelphia by Dr. Pablo Mori-Chavez of the Andean Institute of Biology and Pathology, Lima, Peru.

Two laboratories were used in the South American experiment, Dr. Mori-Chavez said. One was at sea level in Lima and the other was at Morococha, 14,900 feet above sea level. It was undertaken because Peruvian scientists feel the relation of cancer to high altitude has not as yet been adequately investigated under natural and long-term conditions.

At both the laboratories environmental conditions such as temperature, food, humidity and water supply were similar. The variable was altitude.

The results of the controlled study show there was a lower incidence of leukemia at high altitude for male mice. In addition, the spread of the lesions and the size of the lymphomas were much larger at sea level than at high altitude.

An analysis of the age distribution of the spread of the lesions and the size of the leukemia in both groups of mice showed that the age at onset of the disease was somewhat later at high altitude as compared with sea level.

There was no significant difference in the incidence of leukemia in females at both levels.

The males, on the other hand, Dr. Mori-Chavez said, were significantly more affected at sea level than at high altitude.

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IN SCIEN

DERMATOLOGY

Nutrition Finds Little Role in Skin Disorders

► DIET AND ACNE have little to do with one another, Dr. Allan L. Lorincz, assistant professor of dermatology at the University of Chicago, reports in the *Journal of the American Medical Association* (April 12).

Reporting for the A.M.A. Council on Foods and Nutrition, Dr. Lorincz makes the following points:

1. Contrary to popular beliefs, food allergies or nutritional deficiencies play only an insignificant role in the skin eruptions commonly seen in the United States.

2. Overeating that leads to obesity is "by far the most frequently encountered nutritional disturbance that causes or aggravates skin diseases."

3. Although specific dietary restrictions are valuable for some diseases, they do not appear to have much effect on acne vulgaris.

4. Vitamin A has been tried in the treatment of a wide variety of skin diseases with "unquestionable" value in only a few rare disorders.

"From a dermatological point of view," Dr. Lorincz says, "other nutritional factors have mostly only academic interest today; they find little practical application."

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FORESTRY

U. S. Forest Service Acts To Protect Bristlecones

► THE BRISTLECONE pine, believed to be the oldest living thing on earth, now occupies protected land, thanks to action taken by the U. S. Forest Service.

Some 27,000 acres of the Inyo National Forest of the White Mountains, California, containing thousands of pine trees older than 3,000 years, have been set aside as the Ancient Bristlecone Pine Forest.

"The Forest Service wants to preserve and protect these rare pine trees for botanical and historical purposes and for the public enjoyment," Dr. Richard E. McArdle, chief of the Service, said. "Their growth rings have recorded the climatic changes of the past, and the forest is a natural laboratory for basic research in longevity, genetics, and other phases of forest biology."

A grove of the oldest trees, 100 are more than 4,000 years old, will be named the Edmund Schulman Memorial Grove in honor of the man who discovered that the ancient bristlecones may be the oldest living things in the world. The late Mr. Schulman and M. E. Cooley of the University of Arizona were studying the trees in 1957 when he discovered their great age.

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CE FIELDS

AGRICULTURE

Plant Tranquilizer Available This Season

► FARMERS now have a tranquilizer developed especially for them.

The tranquilizer is for plants and is said to reduce the effects of shock and stress caused by heat spells, sudden cold snaps, too much rain, or too little rain.

The plant quieter is called Duraset-20W by its developers, the United States Rubber Company. Chemically, it is N-Meta-tolyl phthalamic acid.

It works two ways, according to the rubber company scientists: when sprayed during blossom time it helps plants and trees retain fruit-producing blossoms in the face of poor growing conditions; and it can more than double the number of blossoms for some plants.

A wettable powder, the chemical is mixed with water and sprayed onto plants. In field tests, it helped increase the yield of lima beans up to 90%; doubled the amount of fruit formed on cherry trees; and increased yield of cotton plants from 10% to 30%.

The chemical, available for use on selected crops this season, was discovered by Drs. Allen E. Smith, chemist, and Albert W. Feldman, plant pathologist, of the company's Naugatuck chemical division.

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CHEMISTRY

High Flying Planes Make Own Fuel

► A SMALL, unmanned airplane that carries no fuel, but will be capable of manufacturing its own fuel from trace quantities of material present at the high altitudes was described to a meeting of the American Chemical Society in San Francisco.

The revolutionary idea is also expected to lead to development of a much larger craft that will continuously circle the earth, gathering and storing nature's own fuel components. These could be used to feed other space craft as they prepare for their flights into farther space after being propelled to the fuelling craft's altitude by conventional propellants.

The feasibility of operating such aircraft on small amounts of atomic oxygen present at approximately 60 miles above the earth's surface was described by S. T. Demetriades and Dr. C. B. Kretschmer, Astronautics Laboratory, Aerojet-General Corp., Azusa, Calif., and M. Farber, Hughes Aircraft Co., Culver City, Calif.

Ordinary oxygen exists in a molecular form, with two oxygen atoms combined to form one gaseous oxygen molecule. Probing of the earth's upper atmosphere with high altitude sounding rockets have revealed

the presence there of uncombined oxygen atoms in small quantity.

Considerable energy is released when two oxygen atoms combine. It is this energy that would provide power for the proposed space craft. Enough thrust could be developed from the naturally-occurring fuel elements to overcome the slight drag a ship would encounter at the 60-mile altitude.

The scientists envision a practical application for a ship that could be built in the immediate future. Since the craft would have to be extremely light and have a large surface area, it could be made of thin metal foil and act as a wide-range television reflector or micro-wave relay station.

A first small, unmanned ship also would provide scientific data necessary for building the proposed flying rocket propellant factory.

The larger ship not only would operate on the power of recombined atomic oxygen from its environment, but also would collect and store atomic oxygen.

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MEDICINE

Diabetes Identified As Two Distinct Types

► HUMAN BEINGS suffer two distinct types of diabetes.

Diabetes can no longer be considered simply as one disease to be treated with insulin, Dr. Henry Dolger, chief of the diabetes clinic of Mt. Sinai Hospital, New York, told the American Chemical Society meeting in San Francisco.

The new drug Orinase, taken by mouth instead of by injection, has proved to be effective in more than 50% of adult diabetics, and "has thereby created the first separation of diabetes into two categories," Dr. Dolger said.

Many medical researchers have felt the condition of diabetes mellitus, commonly called simply "diabetes," actually represents a number of different kinds of diabetes. However, until now they have had no proof.

Studies using Orinase show, Dr. Dolger said, that persons afflicted with diabetes fall into two groups: 1. those who have no insulin available to begin with, and 2. those who have insulin available but suffer some interference with its proper liberation and use.

Insulin is a hormone secreted by the healthy pancreas. It helps the body convert food into energy. A person suffering diabetes is not able to utilize properly all the available sugar and starch to produce energy. Excess body sugars are passed into the blood and urine.

Injections of insulin help patients suffering both categories of diabetes. Orinase has been helpful in a majority of patients who have insulin available in their bodies but have not been able to utilize it properly.

"This is a most important implication for the future elucidation of the cause of diabetes, and this definition into two groups will afford a better research material and a clearer understanding of the disease," Dr. Dolger declared.

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ARCHAEOLOGY

"Mystery of Decapitated Mouse" Unearthed

► IN UNEARTHING some ancient graves in Peru, archaeologists came across a real scientific mystery.

If they were writing fiction, the title of their report would be "The Case of the Decapitated Mouse," the archaeologists Drs. S. K. Lothrop and Joy Mahler comment in a report to the Peabody Museum, Cambridge, Mass.

The body of the mouse was found in one corner of a group of seven small adobe burial chambers. This corner cist contained the bones of an infant in an urn which rested on a layer of interlaced reeds and was surrounded by clean sand. Under the reeds was the mouse without a head.

The head itself was found with remains of two adult bodies in the cist at the opposite corner.

The graves were of the Late Nazca people and were found at Chavina, Peru.

Another peculiar find in the graves was the decapitated body of a man. His head was replaced by a gourd with a turban wrapped around it.

The whole group of burials was unusual, the archaeologists comment, because it represents an individual of importance who was interred with his retainers of both sexes and various ages.

The number of people wealthy and powerful enough to command this form of burial must not have been great, and archaeologists rarely have recorded similar finds.

A radiocarbon date obtained on some textiles found in the graves indicates that they were made about 1,320 years ago, between 576 and 696 A.D.

Cast copper spear-thrower pegs were also found in the graves, indicating that copper and the casting technique was known at that early date.

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PSYCHOLOGY

Train the Henpecked To Dominate Others

► THE MOST dominant individual in a group can be trained to be the most submissive and the most henpecked individual can learn to dominate.

At least this reversal of social position can take place in a flock of hens, it was reported to the American Psychological Association meeting in Philadelphia.

Drs. Wendell I. Smith and E. B. Hale of Bucknell University and Pennsylvania State University, respectively, succeeded in completely reversing the "pecking order" of a whole flock of hens.

The training for the new social role was accomplished by giving an electric shock to the originally dominant hen each time she tried to eat in the presence of another hen or threatened, pecked at or attacked her. The originally submissive hen was rewarded in the same situation.

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