

different parts of several varieties of rice, including "juice" from crushed leaves, and rice polish, the by-product remaining after rice kernels are milled. The rice polish proved most effective.

Lt. Allen and Dr. Kahn also experimented with other viruses on the Pinto and Black Valentine bean plants and reported up to 100% inhibition of the disease.

They noted that the following implications can be attached to their discovery:

1. Rice polish amounts to an "immunizing" of beans under greenhouse conditions against several types of virus diseases, much like preventing disease in humans and animals by vaccination.

2. It might prove to be a more rapid control than hunting for resistant varieties of plants.

3. The rice by-product might offer wide-scale treatment of plants against viral diseases.

4. It might also be effective against virus diseases of humans and animals.

## Sea Blows Bubbles

► THE BUBBLES in ocean water that cause a foamy surface are sometimes formed in deep layers, a Navy scientist told biologists at their annual meeting.

Qualitative studies of bubbles, he noted, can be made while "washing dishes, taking a bath, or even sipping a drink at the bar." However, because bubbles are of interest to both marine biologists and underwater sound specialists, Dr. E. C. LaFond of the U. S. Naval Electronics Laboratory, Point Loma, Calif., went to the ocean itself for his study.

Some are formed, he found, from sea floor gas seepage, fish "burps," decomposition of organic matter. Others result from breaking waves, but these do not extend below 20 feet. Some bubbles are formed under sea surface slicks. Others are produced by the generation of oxygen by photosynthetic processes of plankton, and these bubbles are then displaced to the surface by internal waves.

## Cell Study Tells Sex

► THE SEX of human embryos can now be determined as early as the third week by sex chromatin studies, Dr. Emil Witschi, State University of Iowa, Iowa City, reported to the biologists' meeting.

This shortens the time needed to identify human sex by about four weeks, he explained.

"Questions about the age at which human embryos differentiate into males and females have been much debated during the past 100 years, but specialists generally admitted that sex was not recognizable before the seventh week of embryonic growth, even under the microscope," Dr. Witschi reported.

A developing embryo can also switch its sex from male to female or vice versa. These reversals occur occasionally in humans and come from such conditions as overripeness of the egg at fertilization.

The sex chromatin technique used was developed by Dr. Murray Barr, a Canadian

neurologist who found that the nuclei of cells taken from an embryonic heart differed according to the sex of the embryo.

Dr. Witschi tried the same method on a number of preserved human embryos, all less than one inch in length, and found that the developing sex could be recognized well before the differentiation of the sex glands.

Two years ago Dr. Witschi and an associate, Dr. C. Y. Chang, reported that they could experimentally reverse the sex in the African toad *Xenopus*. Male embryos of the toad had been changed into egg-laying females by giving them estradiol, a female hormone.

## Need Biotin in Pregnancy

► THE VITAMIN biotin is a must in the diet of pregnant mothers. A biotin-deficient diet can result not only in a termination of the pregnancy, but in the production of smaller and lighter babies suffering from heart abnormalities, damaged livers and underdeveloped kidneys.

This has been shown in experiments with white rats, Drs. William A. Cooper of West Texas State College and Sidney O. Brown of Texas A. and M. College reported to the biologists.

Female rats were made deficient in biotin, normally supplied in the human diet by egg yolk, tomatoes, yeast, cane molasses and other foods, by feeding them a purified diet containing raw egg white. A substance in egg white combines with the vitamin and prevents it from being absorbed from the intestine.

Mother rats fed the experimental diet for five to seven weeks before mating produced offspring that were smaller in size and lighter in weight than those produced by normal mothers. Those rats on the diet for from 12 to 20 weeks before mating produced no offspring.

The smaller newborn rats that were produced had certain heart abnormalities, damaged livers and kidneys that failed to develop properly and "apparently would not function satisfactorily," the scientists said.

Biotin, Drs. Cooper and Brown concluded, must now be added to the lists of vitamins, such as A, K, E, B-2, folic acid, B-6 and B-12, recognized as "factors essential for the maintenance of pregnancy and the production of normal offspring."

## Bone Cancer From Tests

► SOME HUMAN beings may be presently in danger of developing bone cancer and possibly leukemia as a direct result of nuclear weapons testing.

This was hinted at during a press conference attended by five of the nation's foremost authorities on radiation effects and fallout problems at the biological sciences meeting.

A recent study has shown that the unleashing of 20 more megatons of fallout could tip the scales for some individuals and put them at or over the "maximum permissible for the human body concentration" of cancer-causing strontium-90, Dr. Curtis

Newcombe of the U. S. Radiological Defense Laboratory, San Francisco, said.

But 20 more megatons may already have been unleashed.

Dr. Newcombe explained the study was based on the amount of fissionable material from U. S. weapons testing alone. What Russia and England have added to the fallout statistics is not known. The U. S. figures, it is estimated, show 50 megatons of fallout have rained down on earth and carried with them the cancer-causing radioactive element, strontium-90.

This element finds its way into the human body in the water we drink and the food we eat. Just how much depends on the amount of calcium present also. The more calcium, Dr. Newcombe explained, the less strontium-90.

Dr. H. Bentley Glass of Johns Hopkins University, Baltimore, Md., said it is the scientific consensus that if ten megatons of fallout were dumped on the world annually, the safe limit for strontium-90 would still be preserved.

Whether leukemia can be caused by strontium-90 is anybody's guess, the scientists said, but there is always the possibility that it could.

Other scientists participating in the conference were Drs. George W. Beadle of California Institute of Technology and chairman of the National Academy of Sciences' committee on genetic effects, Arnold H. Sparrow of Brookhaven National Laboratory and Carl Swanson of Johns Hopkins University.

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## HORTICULTURE

### Smog Reduces Growth Of Citrus Trees and Fruit

► SMOG HAS been pin-pointed as causing substantial weight losses in grapefruit and lemon seedlings, reports Dr. O. Clifton Taylor, horticulturist at the University of California, Riverside.

The effects of both artificial and natural smog were studied.

The dry weight of grapefruit seedlings exposed to artificial smog was reduced 17%. Fresh weight was down 12%. Lemon seedlings suffered greater losses: dry weight was cut 37% and fresh weight dropped 33%.

Natural smog affected trees growing at the Los Angeles State and County Arboretum, Arcadia, to the extent of reducing their growth by 20%, Dr. Taylor has reported.

No visible symptoms of leaf injury were apparent, he said. However, in melon seedlings, exposed to synthetic smog, there was seven times as much leaf drop as in plants of the same type and age grown in purified air. Smog may thus be a possible explanation for leaf drop becoming such a serious problem in the Los Angeles basin over the past four years.

The grapefruit and lemon seedlings were grown in an artificial smog made by reacting ozone with hexene vapor. The smog was kept "closely comparable" to Los Angeles' average daily smog, with an index of about 0.2 parts per million.

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