

TECHNOLOGY

Carbon Filters Promise Relief From Smog

➤ HERE IS good news for factory workers, hospital patients and homeowners bothered by smog: activated carbon filters in air conditioning systems hold promise of providing relief.

Experiments by Neal A. Richardson and Wilbur Middleton of the engineering department at the University of California at Los Angeles, indicated that such filters significantly reduced sensory irritation produced by Los Angeles smog in air-conditioned offices.

Office workers in downtown Los Angeles served as test subjects. Two nearly identical offices in the same building were used as "laboratories." Active filters and "dummy" filters were exchanged periodically between the air ventilating systems of the two offices. Workers did not know which system contained the real filters.

Questionnaire results were used statistically to measure smog irritation among the workers. The questionnaire contained questions relating to the degree of eye smarting, throat and nose irritation, time of maximum irritation. High consistency between individual "irritation scores" and between the average "irritation scores" of the two groups indicated workers could sense small changes in smog intensity.

Test results indicate activated carbon filters reduce sensory irritation resulting from smog. However, irritation was not significantly reduced when a highly efficient particulate filter, a filter that removes particles, was studied. These results suggest that the irritants are present in the form of gas.

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BIOCHEMISTRY

Strange Mental Disorder May Be Due to Chemical

➤ THE CAUSE of a mental disorder that dooms children to a life of feeble-mindedness may be a brain-stimulating chemical called ortho tyrosine that heretofore has only been found in insects.

This was reported by the National Heart Institute, Bethesda, Md. Biochemists there have succeeded in tracing the chemical steps that cause the breakdown of the amino acid phenylalanine.

The mental disorder is called phenylpyruvic oligophrenia, and it is caused when phenylalanine is not handled by the body in the correct way. There are more than 6,000 victims of the disease in this country and there is no available treatment for it.

It is transmitted by heredity and children afflicted with it never develop normal mentality.

Phenylalanine is an amino acid that is an essential part of the diet. It is present in nearly all protein foods, but only a part of it is used directly to build new tissues. The rest of it has to be cleared out of the body. Here is where the trouble starts.

In the normal person, the unused phenylalanine is converted into another amino

acid, para tyrosine, by a special enzyme found in the liver. Then further chemical processes remove it from the body.

Children with phenylpyruvic oligophrenia are born without any liver enzyme to do the work. Thus, other chemical pathways have to be used by the body. Most likely, some chemical by-product is building up along one of these "detours" and poisoning the brain.

The scientists believe the abnormal breakdown steps may be phenylalanine to ortho tyrosine, then to ortho tyramine and finally to another chemical, ortho hydroxyphenylacetic acid which is found in the urine of patients with the disease.

They injected ortho tyrosine into rats and found that it headed straight for the brain where it was converted into ortho tyramine. With this the rats became highly excitable and some had convulsions.

These results strongly indicate that the two ortho compounds are the cause of the mental defect, the biochemists believe.

The research is being done by Drs. Chozo Mitoma, Sidney Udenfriend, Donald Bogdanski and Herbert Posner of the National Heart Institute.

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MEDICINE

Prevent Chickenpox With Gamma Globulin

➤ PREVENTION of chickenpox may be possible with the use of gamma globulin injections, research at the St. Elizabeth Hospital, Youngstown, Ohio, has shown.

The gamma globulin was used as a preventive measure in members of the hospital staff known to have been exposed to the illness, Dr. George X. Trimble, former medical director of the hospital, reports.

Only two cases occurred among the treated group and were, without a doubt, the mildest cases of chickenpox he had seen in the past 11 years, Dr. Trimble says.

There was only a slight fever for two days. One patient had six or seven skin lesions while the other had a total of only 10 or 20.

Doctors and laymen alike view chickenpox as a mild disease and probably do not believe that a preventive measure is needed. But reports over the past year have emphasized that it can be very serious. Death resulting from it is not a rare event.

The gamma globulin treatment was decided on after a Filipino intern died five days after being admitted to the hospital with a case of chickenpox.

The injections were given staff members who had been in contact with the victim and who had never had chickenpox.

Family physicians are in the best position to either confirm or disprove the beneficial effects of the treatment, since the number of hospital cases were too small to be conclusive, Dr. Trimble said.

Dr. Trimble, who reports the globulin treatment in the *Canadian Medical Association Journal* (Oct. 1), is now director of medical education at Seaside Memorial Hospital, Long Beach, Calif.

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IN SCIENCE

BOTANY

Plant Explorers Add To U. S. Sugarcane Supply

➤ PLANT EXPLORERS venturing near the land of the New Guinea head hunters have come back with new "germ plasm" for the nation's sugarcane crop.

As a result of the scientists' five-month explorations we may soon have new commercial varieties of sugarcane, plus plants with stronger genetic resistance against diseases that attack crops here, the U. S. Department of Agriculture has reported.

A larger supply of germ plasm—cuttings and seeds—is needed for two reasons.

For years plant scientists have had to supply growers with new, vigorous, high-yielding varieties of sugarcane because old varieties tend to "run out" and become less productive. Also one disease alone, ratoon stunting, causes an annual loss of 10% to 25% of the sugar and sirup production from cane plantings.

Carl Grassl of USDA's Agricultural Research Service and Dr. John Warner, plant breeder with the Hawaiian Sugar Planters' Association, brought back more than 200 cuttings of three types of sugarcane: "chewing canes," edible-top canes, and the wild ancestor of our modern plant.

When the new varieties have been released following a two-year quarantine period, research involving the breeding and selection of better sugarcanes can begin. The USDA's world collection of sugarcane at Canal Point, Fla., is particularly important today since native plantings are rapidly disappearing with the advance of civilization.

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PALEONTOLOGY

Find Cave-Dwelling Pre-Dinosaur Reptiles

➤ AN OKLAHOMA limestone quarry has yielded remains of cave-dwelling reptiles that lived more than 30,000,000 years before the dinosaurs.

The quarry is in the Wichita Mountains in the southwest corner of Oklahoma.

Dr. Frank Peabody, paleontologist at the University of California at Los Angeles, who has studied the site, reports erosion and quarrying have exposed a limestone highland that was honeycombed with caves during the early age of reptiles, 210,000,000 years ago.

Apparently the caves were used for shelter by large reptile predators, probably pelycosaurs. Remains of their prey—small amphibians and reptiles—are scattered throughout the soft clay deposits of the caves.

Dr. Peabody said it was unusual to find evidence of highland life of this era preserved this well, and especially in soft clay.

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CE FIELDS

MEDICINE

Blood Pressure Device Inserted Inside Body

► AN ELECTRONIC blood pressure recorder small enough to be inserted in a blood vessel and pushed up into the heart has been developed.

The meter is about the size of the end of a match stick and causes no pain or discomfort as it is moved through the body. It is fastened to the end of a thin flexible plastic wire and inserted into a vein in the arm.

It promises to be most useful for studying blood pressure in the veins, Dr. Herbert O. Sieker of the Veterans Administration hospital, Durham, N. C., said. These pressures are much more difficult to measure than those in the arteries, which can be easily determined with the standard blood pressure cuff.

The venous pressure is very small in comparison to the arterial pressure. The greatest venous pressure found in some parts of the arms and legs may be comparable to the weight of an ordinary lead pencil, Dr. Sieker said.

Blood flows back through the veins because of several forces acting on it, one being the suction action created by the heart and lungs, and another being muscular contraction around the veins.

The new device contains a small float or plunger that hangs freely in a magnetic field, with the tension of a tiny coil spring.

As the pressure in the vein changes, the plunger moves and causes a small electrical impulse to travel along the wire to an amplifier and recording device outside the body. The results are read by the doctor as a band of waves.

The device was developed by Dr. Otto H. Gauer, a German physiologist who spent several years in the U. S.

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MEDICINE

Feeble-Mindedness From Cretinism Prevented

► FEEBLE-MINDEDNESS resulting from congenital hypothyroidism, also known as cretinism, now can be prevented by a method of diagnosis and treatment developed by medical scientists at the University of Michigan.

Prompt action at birth can save a child suffering with the disease from a life of mental and physical retardation that often spells life-long institutional care. This was found in a study of 83 cretins made by the University's Drs. William H. Beierwaltes and George Lowrey.

The team members claim they "have discovered concrete data, for the first time, that early diagnosis and treatment with larger than generally used doses of thyroid

medication will result in the child attaining a normal IQ and good physical development."

The disease afflicts children at birth. It is a form of endocrine gland disease resulting from being born with no thyroid gland, a gland that produces a limited amount of thyroid hormone, or a very active gland that produces no hormone.

The thyroid hormone is "vital" important to the development of insulation around nerve strands and, without it, something very much like a "short circuit" takes place, causing mental and physical retardation.

In spotting the disease at birth, Drs. Beierwaltes and Lowrey say there are nine medical and physical criteria that act as warning signals and warrant one or more of five laboratory tests. These criteria are: high birth weight (more than eight pounds); umbilical hernia; feeding or respiratory difficulty at birth; constipation; retarded growth; dry skin; lethargy, and unusual sleepiness in the period shortly following birth.

The doctors stress, however, that the presence of one or more of these conditions does not mean a baby has congenital hypothyroidism.

If the laboratory tests show the child is suffering from cretinism, "prompt application of thyroid hormone substitutes can prevent the 'short circuit,' permitting the child to have a normal life."

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MEDICINE

Speeding Ambulances Not Needed, Study Shows

► THE SPEEDING ambulance is unnecessary and does the accident victim more harm than good, Drs. George J. Curry and Sydney N. Lyttle, Hurley Hospital, Flint, Mich., have concluded.

From a study of 2,500 consecutive ambulance runs, they found that in 98.2% of the cases there would have been no difference in the patient's condition if he had been transported according to standard traffic regulations.

The other 1.8% did benefit from quick and careful handling at the scene of the accident but speeding back to the hospital could have increased the severity of their injuries.

Panic in the minds of the public is behind the widespread belief that speed is important, the surgeons reported.

"The average patient would get there soon enough by parcel post," they quoted Dr. Basil C. MacLean, New York City Commissioner of Hospitals.

The surgeons recommended that ambulances, when transporting injured persons, should observe the local speed laws of the vicinity in which they are traveling.

However, they should have the right of way and retain the use of their sirens to avoid any unnecessary delays.

The patient deserves a safe, expeditious ride to the hospital, they concluded in their study which appears in the *Journal of the Michigan State Medical Society* (Sept.).

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MEDICINE

Advise Against Wide Use of TB Vaccine

► THE U. S. PUBLIC HEALTH Service has advised against the large scale use of BCG, the only available anti-tuberculosis vaccine.

A committee of TB specialists, appointed by U. S. Surgeon General Leroy E. Burney, has recommended that it be used only in groups where TB exposure was unusually high and where other means of control are inadequate. BCG has been used in tuberculosis immunization for more than 30 years and has had broad acceptance in some European countries.

It is made from a strain of living tubercle bacilli which does not produce active disease but can produce some immunity. The amount of immunity ranges from none to 80%.

One basic objection to a country-wide vaccination program is that BCG offers no protection to persons already infected. These are the ones most likely to develop active tuberculosis.

The vaccine would also cancel out permanently the effectiveness of the tuberculin test, by which it can be determined whether an individual is infected with tuberculosis. After the BCG vaccination, everyone would show a positive reaction to the tuberculin test even though he was not infected.

Thus, one of the important tools for discovering and diagnosing tuberculosis would be ruined, the committee reported.

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ENTOMOLOGY

Virus Offers Hope For Bollworm Control

► THE END may be in sight for the bollworm, an insect that has caused multi-million dollar losses to the nation's cotton crop.

Isolation of a virus that causes a wilt disease in the bollworm was reported by G. H. Bergold of the Laboratory of Insect Pathology, Sault Ste. Marie, Ontario, Canada, and W. E. Ripper of Fisons Pest Control, Ltd., Bourne, Cambridge, England, in *Nature* (Oct. 12).

Working with a sample of only five dried bollworm larvae, the scientists were able to obtain a preparation containing the irregularly shaped, polyhedral bodies typical of certain groups of viruses. Further purification resulted in identification of a new virus tentatively named *Borrelina armigera*. It is rod-shaped and occurs mainly as single rods measuring about 320 millimicrons long by 90 millimicrons wide. (There are 1,000 millimicrons in one micron; one micron is 0.000039 inch.)

The bollworm is hard to control because it is difficult to kill with insecticides once it gets inside the cotton bolls or pods. Sometimes its presence goes undetected until it is too late. The same insect, *Heliothis armigera*, is called the corn earworm, or the tomato fruitworm, depending on what crop it attacks.

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