

BACTERIOLOGY

New Antibiotic Found in Indian Foods and Soils

► THE DISCOVERY of an antibiotic that is effective against many types of fungus infections was reported by S. K. Majumdar and S. K. Bose, University College of Technology, Calcutta, India, in *Nature* (Jan. 11).

The antibiotic has been named "mycobacillin" and was found during studies of the antifungal organisms in Indian fruits, vegetables and soils, the scientists report.

It is a strain of *Bacillus subtilis* and is obtained in highest yield from a medium made up of potato extract, casein hydrolysate, beef extract and glucose. The antibiotic is extracted from the fermentation broth of the mixture, and crystallizes out as light brown, needle-shaped crystals.

Mycobacillin has no effect on such common disease-associated bacteria as *Staphylococcus aureus* or *Streptococcus faecalis*, but it does have a wide range of antifungal activity.

Chemical analysis showed it contained seven amino acids, the most predominant being aspartic acid, the one found in asparagus in another form.

The antibiotic is somewhat different from other known antifungal antibiotics, such as bacillomycin, bacillomycin B, C, etc., because of the type and amount of the amino acids present, the scientists report.

Science News Letter, January 25, 1958

MEDICINE

Metals Stored in Tissue Before Cancers Begin

► EVIDENCE that certain metals accumulate in the tissues before a person develops cancer is reported by a group of Midwestern scientists in the *Journal of the American Medical Association* (Dec. 28, 1957).

Up to now, it has been thought that high concentrations of trace amounts of metals are present only after cancer occurs and are due to a secondary storage of the metals.

Two findings, however, have led the scientists to believe that the storage actually takes place before the cancer begins. These are the presence of increased metal in the lungs, kidneys and liver as well as in the cancer tissues, and also the fact that the cancer tissues themselves have a much smaller amount of these metals than surrounding tissue.

Definite conclusions about the role the metals might play in causing the cancer cannot be drawn yet, but the relationship between the two conditions should be more thoroughly studied, the scientists point out.

Some metals and their compounds, even when present in the body in large amounts, are not believed to be dangerous as far as cancer goes, but there are other ones which are known to cause cancer or are suspected of causing it.

Among these are arsenic, chromium, molybdenum, nickel, cobalt, aluminum, beryllium, cadmium, silver, selenium, zinc and metals with radioactive properties,

These are accumulated from food and air taken into the body.

In patients with cancerous diseases, an elevated amount of chromium was found in lung and liver tissues, although these tissues were not the ones affected with the cancer.

Patients with inflammatory lung disease had elevated levels of several metals in the lung tissues. Because of the known relationship between continual inflammation and tumor formation, a selective storing of the elements in the inflamed tissues could be a positive factor in cancer development.

The scientists include Drs. Norbert W. Tietz, Edwin F. Hirsch and Benjamin Neyman, Henry Baird Favill Laboratory, Presbyterian-St. Luke's Hospital, Chicago. Dr. Tietz is now at Reid Memorial Hospital, Richmond, Ind.

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PSYCHIATRY

Normal "Stablemates" Help Treat Mentally Ill

► NORMAL stablemates have been used to help treat the mentally ill, in a new form of group therapy at the State Hospital, Central Islip, N. Y.

The stablemate is a normal individual who joins a schizophrenic patient and a "group leader" for treatment sessions. The idea behind the method can be visualized by considering what happens when two horses from the same stable race.

The horses feel more secure in their new surroundings because of the presence of a familiar and safe object, the stablemate.

Other types of group therapy arrangements have been tried with the mentally ill, including having relatives of the patients in the group, or using other psychotic patients. Both of these have their disadvantages.

In the stablemate technique, a normal person generally of the same age and sex as the patient, joins in a three-hour interview with a group leader once a week. Both the stablemate and the leader are unpaid volunteers and are not professionally trained personnel.

Their presence helps to draw the schizophrenic out from himself and transfer his attention to other people.

Even greater participation by the patient can be obtained if he is given LSD.

This is the drug that creates the symptoms of mental illness when given to normal people. When given to the mental patients, however, it makes them more willing to enter into the group discussions and less preoccupied with their own problems.

Reporting on the research, published in *The Journal of Psychology* (Jan.), were Drs. H. A. Abramson, M. P. Hewitt, H. Lennard, W. J. Turner, F. J. O'Neill and S. Merlis, State Hospital, Central Islip, N. Y., the Biological Laboratory, Cold Spring Harbor, N. Y., and the Bureau of Applied Social Research, Columbia University, New York, N. Y.

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IN SCIEN

SURGERY

Sharper Knives for Medical Studies

► A NEW WAY of sharpening surgical knives has been devised by a Sydney, Australia, scientist, G. A. Bell. Mr. Bell undertook the research at the request of brain pathologists and research workers.

Hitherto the knives of microtomes, devices used to slice off sections, have been unable to produce more than 100 sections before becoming blunt. Because of the method used, each knife took at least three hours to sharpen.

Mr. Bell's method provides a knife that will cut an average of 1,000 good sections and can be resharpened in 10 to 12 minutes. He sharpens the knife on abrasive embedded in bronze instead of loose abrasive on glass.

The new method was described by N. A. Esserman, metrology division of the Government-financed Council for Scientific and Industrial Research Organization, East Melbourne, Australia.

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PEDIATRICS

Shot Reactions Show Degree of Maturity

► HOW YOUR child reacts to getting a shot is a good clue to how emotionally mature he is, Dr. Karl E. Kassowitz, pediatrician of Milwaukee, Wis., reports in the *Journal of Diseases of Children* (Jan.) published by the American Medical Association.

The many shots and vaccinations children must routinely undergo are an excellent means for studying their psychology and measuring their maturity since the child must learn self-control and develop "toughness."

Children's reactions to shots show how well they have developed these traits.

A study of 133 children from infancy to 12 years of age revealed that the responses changed with the years. During the first six months, children have no emotional response to having a shot, Dr. Kassowitz reports.

From the end of the first year through the fourth, however, there is the greatest amount of "more-or-less violent fear and resentment." From the fifth year a steady decline in fighting occurs and, after the eighth birthday, fighting becomes the exception. Then, self-control and pride in being able to take the shot usually take over.

In fact, lack of self-control after the age of eight to nine may be considered a clue to an underlying emotional disturbance, Dr. Kassowitz believes.

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CE FIELDS

BACTERIOLOGY

Unique Bird Digests Wax With Help of Bacterium

► PART OF the honey-guides' secret is out. Studies of this unusual family of African birds show that they digest bees' wax with the help of a bacterium found in their intestinal tract.

Scientists are hopeful the discovery may offer a clue to a new attack against tuberculosis.

The new bacterium was discovered by Drs. Herbert Friedmann, curator of birds at the Smithsonian Institution, and Jerome Kern, formerly of the department of bacteriology at the Walter Reed Medical Center's Army Medical Services Graduate School. It has been found to have some "degree of interference" with the tuberculosis-causing bacterium.

For years, scientists have been searching for ways to destroy the lipoidal or waxy content of the disease organism. It is this waxy content that very likely protects the organism against therapeutic attack. Further studies are planned to see how the waxy content is affected by the new bacterium.

Micrococcus cerolyticus, as the "wax-breaking" bacterium is called, was described to the Johns Hopkins University's Society of Hygiene meeting in Baltimore, Md. Identification of the bacterium is the result of more than three years' study of the honey-guides and their behavior and biology. Dr. Samuel J. Ajl, Walter Reed Medical Center, has assisted in the research.

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MEDICINE

Allergies May Be Factor In Childhood Leukemia

► ALLERGIES in mothers and children may be an important factor in the development of childhood leukemia.

This has been indicated by an epidemiological study of the cancerous blood disease by Dr. Miriam D. Manning, and Benjamin E. Carroll, Children's Cancer Research Foundation, Boston, Mass., and the National Cancer Institute, reported in the *Journal of the National Cancer Institute* (Dec. 1957).

The scientists found a significantly larger number of mothers of children with both leukemia and lymphatic cancer had a history of hay fever, asthma or hives, compared with control groups or with those having other types of cancer. Their children also had a higher incidence of allergy, often appearing as eczema.

Another significant finding was that almost twice as many mothers of leukemic children had been exposed to X-rays before the birth of their child compared with other groups. The X-ray exposure included

any and all "therapeutic irradiation" both before or during pregnancy, without relation to the site or dosage of exposure.

The mothers and children did not as a rule have the same allergy. This might indicate that the child of an allergic mother starts life with a greater susceptibility, though not necessarily the same form of allergy, to sensitizing agents that may later damage the blood-forming ability of bone marrow.

Other researchers have already shown that hypersensitivity can be transmitted between mother and unborn child.

It may be that the child receives a hypersensitive state from the mother which turns into leukemia only upon later exposure to bone-marrow depressing agents.

"We believe that the data presented justify and should stimulate further investigation along this line of approach to the problem of acute leukemia in children," they conclude.

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ANTHROPOLOGY

Big Chest, More Blood Help Indian on Andes

► ADAPTATION through heredity and further adaptation during the individual's lifetime work together to make the big-chested, stocky little Andean Indians able to live and work hard two miles or more above the level of the sea.

The changes that these two forces of adaptation have made in the Indian's body were studied at Hacienda Vicos, high in the Peruvian Andes, by Dr. Marshall T. Newman, physical anthropologist of the Smithsonian Institution, Washington.

Most striking is the enormous size of the Vicos Indian's chest and the lungs inside it. There is a decided enlargement of the lower part of the rib cage so that the Indian can breathe deep and the diaphragm is also set low. An expanded inner lining of the lungs makes it possible to pick up the maximum of oxygen from the thin mountain air.

The Andean Indian also has more blood than the man at sea level—on the average two extra quarts. The red cells in his blood are larger, providing more surface for taking up oxygen, Dr. Newman reports in *Natural History* (Jan.).

With this larger quantity of thicker blood, the Indians also have a larger, more powerful heart to pump it. They seem to have a better blood supply in their extremities, because even in the intense cold of the mountain top before sunrise, their bare feet and hands are warm.

Another adaptation that protects them both from the strains of altitude and the intense cold is their stocky build. This reduces the distance that blood must circulate to the extremities and also reduces the surface area of the body which can cause loss of body heat by radiation.

Dr. Newman learned the effects of high altitude during a study of the Vicos Indians' blood pressure. Much of the data presented in his report is the work of the Institute of Andean Biology, Lima, Peru.

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MEDICINE

Blood and Glass Create Pain-Producing Chemical

► A PAIN-PRODUCING substance formed when blood plasma is brought into contact with glass is described by Dr. J. Margolis of Middlesex Hospital Medical School, London, England, in *Nature* (Dec. 28, 1957).

The pain-producing substance appears to be formed by the action of an enzyme in the plasma, but it is rapidly destroyed by another type of chemical substance in the plasma, called a peptidase.

The formation of the pain-producing substance is similar to the initiation of blood clotting by glass.

Chemical analysis showed that the pain-producing substance is formed in several steps. When the plasma is exposed to glass, a substance that has been called "contact factor" is first formed. This "contact factor" then starts further reactions which lead to formation of the pain-producing substance.

The "contact factor" is most active after two minutes, but within 20 to 30 minutes its activity has decreased to negligible values, Dr. Margolis reports.

The "contact factor" develops normally in the plasma of persons with certain blood disorders, such as hemophilia and Christmas disease, in which the blood has lost much of its ability to clot.

Apart from glass, certain other surfaces are capable of activating both pain-producing substance and blood clotting. The exact surface conditions that are involved are still being studied but a clue to the mechanism may lie in the behavior of dried silica gel and alumina.

These are both inactive to begin with, but become quite active after being heated to above 1,000 degrees centigrade.

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ANTHROPOLOGY

New Dates Add to Man's Antiquity in America

► MAN IS now known to have lived in what is now Alabama close to 9,000 years ago. This is the oldest radiocarbon date for material associated with man's tools in the eastern United States.

The date, 7,950 plus or minus 200 years ago, is published in *Science* (Dec. 27, 1957) by Drs. W. S. Broecker and J. L. Kulp of the Lamont Geological Observatory, Columbia University, Palisades, N. Y.

The date was obtained from charcoal found 13 feet below ground level in Russel Cave, Jackson County.

The radiocarbon dates reported from Lamont Observatory also suggest that man occupied the west coast of North America much longer ago. Charred dwarf mammoth bones found 36 feet below the top of the alluvium were dated at 29,700 years ago plus or minus 3,000.

"This suggests," the scientists say, "that man occupied the west coast of North America before the major ice advance of the latter part of the Wisconsin glacial period."

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