

MEDICINE

New Drug Treatment For Pneumonia, Boils

► PRELIMINARY TESTS indicate that a new class of drug compounds might be safe to use against the organisms that cause pneumonia and boils.

The compounds produced the same inhibition as penicillin when used against *Staphylococcus aureus*, a species of organism that causes boils and pus-producing infections, and *Diplococcus pneumoniae*, which causes not only pneumococcal pneumonia but meningitis, mastoiditis and other conditions.

A number of compounds were synthesized from the mesoionic 1,3,4-thiadiazoles by U.S. scientists who reported their discoveries in *Nature*, 204:697, 1964.

Preliminary pharmacological tests indicate low toxicity in mice, but a great deal of work remains to be done before the new compounds can be tried out on humans.

Drs. Lemont B. Kier, Matthew C. Dodd and Paul Sapko of the College of Pharmacy, Ohio State University, and Dr. Thomas G. Stewart of the College of Pharmacy, University of Florida, reported the preliminary study.

They saturated disks with the synthesized compounds, incubating the disks with brain heart infusion agar plates of the organisms.

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SPACE

Manned Space Station Could Be Mars Vehicle

► THE MANNED SPACE STATION planned by the Air Force for earth orbit before 1970 could be converted to carry the first U.S. team of explorers to Mars.

The station, which will carry two men in orbit for about a month, could later be adapted as an orbital launching pad, an orbital moon base, or even as an interplanetary craft itself, said C. J. Dorrenbacher of Douglas Aircraft Co., Inc., Santa Monica, Calif.

A "building block" design concept, using modified hardware from our current space programs for future missions, is necessary to keep costs from getting completely out of hand, Mr. Dorrenbacher told the American Institute of Aeronautics and Astronautics meeting in Houston.

The original space station, he said, should first become the command and control center for launching an interplanetary vehicle. Later on, the space station should evolve into the last stage, or mission module, portion of the vehicle itself.

A "convertible" space station, placed in orbit around the moon, could serve as a housing facility, data center and observation platform for lunar exploration. Later it would be converted into an orbital base from which the crew would shuttle back and forth to the lunar surface in a reusable spacecraft. The station would be semi-permanent, with supplies "ferried" to it from earth.

Dorrenbacher described such a multi-purpose space station as weighing 30,000 pounds and measuring about 22 feet in diameter. It would provide a "shirtsleeve," or spacesuit-less, environment and would feature an on-board centrifuge for artificial gravity studies, as well as a hangar for docking supply vehicles from earth.

Solar power and closed atmosphere and water cycles would permit orbital missions of up to 180 days without resupply. The equipment needs and know-how for future 600-to-900-day interplanetary flights would be gathered from these missions.

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STATISTICS

Birth Control Programs Increase in 27 States

► THE NATION'S CAPITAL plus 27 states are now offering programs for family planning either through health department clinics or other agencies.

A similar survey a year ago showed that only 15 states were offering programs, and that the extent of their services within the states was far more limited than those presently offered. Both surveys were conducted by the Planned Parenthood-World Population organization.

The trend toward birth control programs is developing most rapidly in California, Maryland, Tennessee, Kentucky and New Jersey. For the first time, people on relief in New York City received official birth control information along with their checks.

The 27 states now offering birth control programs are: Alabama, Arizona, Arkansas, California, Colorado, Delaware, Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Maryland, Michigan, Mississippi, Missouri, Nebraska, New Jersey, North Carolina, North Dakota, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, Virginia and Wisconsin.

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GEOGRAPHY

Giant Antarctic Ice Mass Being Explored

► A GIANT ICE DOME rising 4,500 feet above sea level is being explored in Antarctica. A party from the Wilkes station there has left on a 70-mile trek to carry out a scientific investigation. Studies of the Wilkes Dome should allow glaciologists to understand more clearly the accumulation and melting of ice masses and the results of these changes.

Survey lines by men from Wilkes station over the past four years revealed existence of the ice dome centered 70 miles southeast of the station.

The dome was of special interest to glaciologists as its shape and glacial behavior were considered in many ways to be characteristic of the Antarctic continent.

It is hoped that studies of the Wilkes Dome, which has an area of about 7,000 square miles, will allow glaciologists to more clearly understand the whole continent.

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IN SCIEN

SOCIOLOGY

Conformity Appears To Be Natural Tendency

► IT MAY BE TRUE of mice, and of men also: conformity appears to be a natural tendency.

Research at the University of California at Los Angeles suggests that two quite different beings thrown together appear to move toward a more common behavior.

Dr. J. Lee Kavanau, UCLA zoologist, chose two wild mice from high up in the Southern California mountains for an experiment in social interaction. He selected two female mice to minimize aggressive actions.

The mice were placed in a special laboratory enclosure in which their actions could be monitored constantly by special electronic sensing devices, undisturbed by human contact. They were provided with nests, which they accepted readily.

Initially they were separated and individually monitored to establish separate behavior patterns. Later they were placed together.

One mouse had a nervous disposition and was very active. The other was docile and relatively inactive.

When placed together the activities of both changed markedly, particularly during the first few days. The active mouse became less active and the inactive one became more active. A marked tendency of the animals to remain in each other's company also was apparent.

Changes in behavior were demonstrably dependent upon social interactions. When the animals were returned to a solitary existence each returned essentially to its previous pattern of activity.

Activity and other traits were measured in terms of eating, drinking, food hoarding, activity wheel running, ambulatory and exploratory movements and sleeping.

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MEDICINE

Cancer Blood Test Reported Promising

► A SIMPLE BLOOD TEST may be able to detect the presence of cancer in humans, Dr. Sergio De Carvalho of the Rand Development Corporation in Cleveland reported cautiously. The test is being studied at the National Cancer Institute, Bethesda, Md.

The test, which is derived from antigens apparently manufactured by cancerous tissues, does not reveal where the cancer is located, but it could lead the way to development of a vaccine after further study.

Biochemical Procedures, Inc., of North Hollywood, Calif., has been screening the procedure and is preparing to make the test available to physicians in this country and overseas.

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CE FIELDS

GEOLOGY

New Sources of Water Tapped in Limestone

➤ ONE OF THE MOST extensive sources of underground water supplies for the United States is located in huge limestone rocks in the Southeast.

Water specialists of the Department of the Interior's Geological Survey report that the large limestone rock formations, as much as 1,000 feet thick, slope towards the sea under all of Florida, southeastern Georgia and adjacent parts of South Carolina and Alabama. V. T. Stringfield and H. E. LeGrand told the annual meeting of the Geological Society of America in Miami.

The limestone deposits which contain huge caverns filled with water, provide Florida and southeastern Georgia with fresh water for many large springs and thousands of artesian wells. An artesian well is made by boring into the earth until ground water flows up like a fountain from internal pressures.

Some of the caves may be as large as those in Kentucky's Mammoth Cave region, the researchers said. One of the largest caverns is 90 feet, and is reported to be 468 to 558 feet below sea level.

The estimated average flow of all the limestone springs in Florida is about three and three-quarter billion gallons per day—about three times the average water consumption of New York City.

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EDUCATION

Top Science Freshmen Spend \$2,700 for College

➤ THE MOST SCIENTIFICALLY talented college students, determined by the 1964 annual Science Talent Search, are spending an average of about \$2,700 to attend college this year.

A survey just completed shows that the 314 honors and scholarship winners in the competition, conducted last winter by SCIENCE SERVICE under Westinghouse sponsorship, are spending about \$850,000.

Their parents are supplying only about 45% of this total.

Of the winners, 286 responding to a questionnaire reported:

All but one is attending college, with the total number of winners divided among more than 120 different institutions. The Massachusetts Institute of Technology attracted 25, Harvard University 22, and Columbia University 11.

More than 95% are majoring in a science curriculum, with the largest numbers in chemistry, physics, mathematics, biology, pre-medicine, engineering and biochemistry.

More than half are receiving some form of advanced placement in some college course.

In one-fourth of the cases, parents are

not helping with college expenses at all. More than two-thirds of the winners are using their own savings to finance part of their college costs.

One in five of the students will work part-time while attending classes, while three out of four have loans. Of the total group, 75% have scholarships.

The scholarships total more than a quarter of a million dollars, \$34,250 of which came from the Westinghouse science awards and the remainder from 150 other sponsors.

Last summer, most of the students worked in addition to studying and traveling. Their jobs ranged from selling ice cream in Central Park and digging ditches to selling pari-mutuel tickets and distributing Fuller brushes.

Dr. Gordon A. Sabine, vice-president for special projects, Michigan State University, has cooperated in analysis of the statistics.

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MEDICINE

Clarify Cystic Fibrosis Relationship to Heart

➤ THE RELATION of cystic fibrosis to failure of the right side of the heart, a leading cause of death in that disease, has been clarified by a series of heart and lung tests at the University of California at Los Angeles.

Drs. Arthur Moss and Richard Dooley of the UCLA Medical School Cystic Fibrosis Center have tested the hearts of 24 cystic fibrosis patients by a process known as catheterization.

This consists of sampling pressures and measuring oxygen in the heart chambers by inserting a small tube into the heart via the veins.

They found that right heart trouble, or *cor pulmonale*, as it is technically called, was largely limited to late stages of the disease.

Lung function tests were also carried out. Those who did poorest on this test had right heart trouble, as confirmed by catheterization.

Since catheterization is a time-consuming and expensive procedure, it would not be done routinely on CF patients, Dr. Moss noted. Electrocardiograms are not reliable in the detection of right heart involvement in CF patients, he added.

However, if the relatively simple lung function test demonstrates a vital capacity of less than 50%, then right heart trouble should be suspected.

Transient infections superimposed on cystic fibrosis may cause a temporary condition of right heart disease, the UCLA physicians said. Careful medical management of these patients to prevent such infections will delay onset of permanent *cor pulmonale*.

Dr. Moss was also able to demonstrate by means of X-rays an enlargement of bronchial arteries in eight CF patients. He suggests that chronic inflammation of the bronchi causes much more blood to flow through these arteries, leading to the pronounced enlargement.

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TECHNOLOGY

Gas Turbine Supertruck Loves Drivers and Gas

➤ A GIANTIC new experimental truck, powered by a 600-horsepower gas turbine engine, treats its drivers like kings and gobbles gas as though there were no tomorrow.

The supertruck stands 13 feet high, towering 18 inches above the biggest busses. The cab is the size of a small room and includes such luxuries as air conditioning, wrap-around heating, a reclining lounge chair, bunk and television set for the off-duty driver, (a two-man crew is standard procedure for cross-country operations), a hot-plate, hot-and-cold drink dispenser, a sink and a toilet. Windows are in the fishbowl tradition with almost 50 square feet of glass providing a panoramic view.

While the comforts of home are abundant, however, there is another side to the story. The 280-gallon fuel tank, located a yard or so beneath the driver at the rear of the cab, will take the "truck of trucks" just about 600 miles, or two and one-seventh miles per gallon.

Ford Motor Company, builder of the vehicle, points out, however, that the truck is not planned for production. Economy would be much greater in a production version, said one Ford official, who predicted that turbine-powered trucks will be "very common" by 1975.

The truck, which is currently being exhibited in Washington, is 96 feet long, including the cab and two trailer sections. Normally, only one trailer is used, as double-trailer trucks, or "tandems," are illegal in many states. The vehicle left Los Angeles on October 29 for a cross-country shake-down trip.

A number of weight-saving techniques have been used, both to improve fuel economy and increase payload. A largely aluminum engine and fiberglass body have kept cab weight down to a mere ten tons.

For comfort, the cab has its own suspension system, independent of the load-carrying part of the truck. It is also provided with "fail-safe" brakes, which go on automatically if air pressure in the main brake lines falls below a safe level.

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ASTRONOMY

Huge Sun-Tracking Unit Tests Solar Devices

See Front Cover

➤ A THREE-STORY solar-tracking unit designed to test various devices that could be used to change the sun's energy into electrical power for long space trips has been operating in Denver, Colo.

Believed to be the world's largest solar-tracking facility, the unit houses a 45-foot parabolic mirror that can produce temperatures estimated greater than 2,000 degrees Fahrenheit. Sundstrand Aviation-Denver, a division of the Sundstrand Corporation, Rockford, Ill., designed and built the facility.

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