

gans" is not a substitute for the method of tissue culture, Dr. Carrel and Col. Lindbergh explain. It is a new technique.

"It is not in any way a substitute for the method of tissue culture," they report. "Its techniques, as well as its purposes, are quite different. As is well known, tissues and blood cells grow like bacteria in flasks containing appropriate media. The techniques for the

cultivation of tissues are somewhat analogous to bacteriological techniques, although far more delicate. But it is through the employment of complex mechanical and surgical procedures that organs are enabled to live isolated from the body. Tissue culture deals with cells as units of bodily structures; the new method, with cellular societies as organic wholes."

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ENGINEERING

Low-Priced Air Conditioning System Seen for Home Use

Key is Silica Gel, Well-Known Cheap Chemical With Extraordinarily High Water-Absorbing Ability

A STRANGE substance that looks like sand but has the power to absorb water vapor from air and which seems destined to reduce the cost of air conditioning to within reach of average home owners, was described before the meeting of the American Society of Heating and Ventilating Engineers at Toronto by W. E. Stark of Cleveland.

This substance, known as silica gel, was widely used in gas masks during the war to absorb poison gases. Until recently it was mainly a laboratory curiosity, although some of its properties have been familiar to science for many years. A new development is its use in air conditioning where it has been proved to be an ideal dehumidifier.

Each crystal of silica gel consists of hard core surrounded by many sub-microscopic pores which, while invisible, reveal their presence in laboratory experiments. The air conditioning device contains silica gel reactivated by passing ordinary natural or coke gases through.

Use of the new system may result in the simplification of air conditioning systems which up to now have been confined to large buildings because of the cost of installing the required equipment. Silica gel was envisioned as playing a leading role in lowering the cost and making air conditioning available to small residences.

The water-absorbing compound is now industrially used as a purifying agent in oil processing and for removing moisture from dry ice. It is also used medically in powdered form to ab-

sorb certain poisons from the intestinal tract. Prof. Auguste Piccard carried silica gel on his stratosphere flights to keep the gondola free of moisture.

The possible use of silica gel for cheap home air conditioning systems will strike at the humidity phase of keeping comfortable. The old quip "It's not the heat but the humidity" that makes one uncomfortable has, of course, much reality. Two cities, one on the seashore and the other far inland, may both have the same temperature on a given day in summer but the one—usually the coastal city—may be more uncomfortable because the atmosphere over it contains so much water vapor. The reason is principally that moisture on the skin cannot so easily evaporate (and thus cool the body) when the surrounding air is heavily laden with moisture.

The use of silica gel which will absorb much of the existing vapor should thus be able to bring comfort in the home, not by tackling the heat side of comfort but by lowering the water content of the air. The more complete and costly air conditioning systems like those in modern theaters control bodily comfort by both methods. The air is cooled and at the same time its water content (humidity) is lowered.

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Contagious diseases are not so common among mammals as among birds.

Oil from a wild cucumber is believed to have been used by western Indians in paint which has withstood exposure for 150 years.

ASTRONOMY

Mercury's Visit to Sun May Reveal Its Atmosphere

THE QUESTION of whether or not the tiny planet Mercury, innermost member of the sun's family, has a layer of atmosphere may be settled within two years when the planet just barely skims the face of the sun on May 11, 1937.

The present conflict between observational astronomers who believe they have obtained definite evidence of such an atmosphere, and others who believe just as definitely, on theoretical grounds, that Mercury could not possibly have retained an air layer, is summarized in a note in the current issue of the *Journal of the British Astronomical Association*. (May). It is signed C. O. B., which are the initials of C. O. Bartrum, secretary of the Association.

Dr. H. N. Russell, of Princeton University, and Dr. H. Spencer Jones, astronomer royal and president of the association, are named as the opponents of the atmosphere theory. On the other hand, Dr. E. M. Antoniadi, of the Meudon Observatory in France, has made observations, with a large telescope, indicating that some of its markings are frequently more or less hidden by local clouds. These observations, declares C. O. B., have been corroborated by a British amateur astronomer, Mr. H. McEwen, director of the Association's Mercury and Venus Section. Of course, if there are clouds, there must be an atmosphere, even though rarefied, to hold them.

When, at rare intervals, Mercury passes directly between the sun and earth in transit, there is an instant when the planet is half in front of, and half off, the solar disk. Then, the presence of an atmosphere may show itself by a ring of light which appears completely around the planet. The air on the edge of Mercury away from the sun would bend some of the light around it, just as the earth's atmosphere bends the sunlight so that we really continue to see the sun for a short time after it has set.

With the ordinary transit, such as last occurred in 1924, there is such a brief period, at the beginning and end, when Mercury is thus at the edge of the sun, that there is little time to make any detailed observations. The transit of 1937 will not be visible from England or northern Europe, for from these parts of the earth the planet will just miss coming in front of the sun. But in southeastern Europe and all of Africa it will be seen, and there the planet will just skim along

the sun's edge, hanging there for about forty minutes. Such a transit occurs but once in nearly a thousand years, and thus it should provide an excellent opportunity of studying Mercury at leisure to see whether there is the arc of sunlight around the portion not projected upon

the sun's disk.

"The presence or absence of such an arc would go a long way to settle the conflict between the planetary observers and the theoretical astronomers," says the author of the note.

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ECOLOGY—AGRICULTURE

Intensive Weather Research Valued Above Klondike Gold

Accurate Knowledge of Climatic Factors Needed For Intelligent Planning of Western Agriculture

"**M**ORE THAN all the gold in the Klondike" was the value-estimate set on a proposed program of intensive research on weather records of the past eighty years, by Dr. Isaiah Bowman, chairman of the National Research Council and director of President Roosevelt's Science Advisory Board, in an address delivered before the American Association for the Advancement of Science.

Emphasizing the necessity for accurate and dependable scientific knowledge in the development of long-range plans for land use, if repetitions of past disasters due to drought, dust storms, erosion and floods are to be avoided in future, Dr. Bowman said:

"Neither a scientist nor a governmental official can handle the problems of the drought on a hunch. We can never solve the problems of the drought by stopping the drought. We can only provide to some degree against its effects; and if we were forewarned against its coming the degree of provision against its effects could be greatly increased. Likewise, we can never solve the problems of soil erosion by stopping erosion. We can only reduce the rate of erosion. The effects of drought and soil erosion will outlast all the regulatory schemes of today.

"Amazement at the dust storms should not lead to the neglect of long-range studies. A strong force of experts should be working on the mass of climatological data on the Great Plains accumulated during the past 50 years by the Weather Bureau. If this were done the result would certainly be more valuable over a ten-year period than all the gold produced in the Klondike."

Such a study would be invaluable in

determining the location of the much-debated Great Plains shelterbelt region, Dr. Bowman suggested. Even on the basis of present imperfect knowledge, the Forest Service has already shifted the projected lines considerably to the eastward of their first proposed location.

But the immediate problem of the semi-arid western part of the Great Plains is not only where to plant more trees and shrubs, waiting twenty to thirty years for results, he continued. Even more urgently is it a challenge "to work out a land-use plan for the grasslands of the vast region west of the proposed shelterbelt and to start operat-

ing the plan now. The climatic map shows us how vast is this marginal area. . . . In two land types where risk is greatest lies the land on which in favorable years farmers are most strongly tempted to grow wheat. There the wheat farmer literally gambles on the rain.

The two types represent areas of maximum risk not because they are occasionally very dry but because they are occasionally so favorably wet as to cause agricultural overextension. To these difficulties has recently been added widespread and unexpectedly severe wind erosion. While the farmer is waiting for a return of moist years, the wind carries his farm aloft.

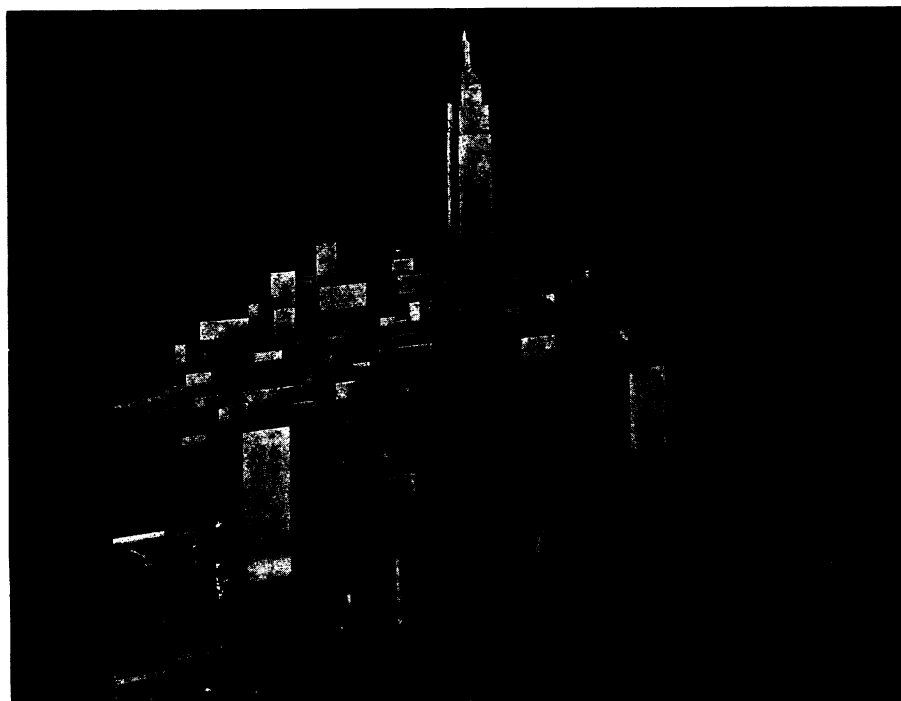
"The problem of the farmer turns on the question, how far can he go in reaping the bounty of the land in wet years and yet survive the penalties of inevitable drought? The problem of the government is to determine whether a man shall be allowed to grow grain in places where he can do so and ought not to."

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ENGINEERING

Miniature Manhattan In Artificial Wind

TO DETERMINE how winds stress large buildings, National Bureau of Standards scientists have built a model of the world's highest structure, New



FOR THE CITIZENS OF LILIPUT