BOTANY

Tree Gets Water from Air

➤ A NEW plant secret may have been uncovered in Berkeley, Calif., with the discovery that a mountain tree, the Coulter pine, can drink water out of the air.

The phenomenon may explain how this tree and various types of brush can survive drought on southern California mountain slopes, where in midsummer the soil becomes so dry that other plants wither and die.

Experiments proving that Coulter pine seedlings can suck water from atmosphere of high moisture content are reported in the journal, SCIENCE (May 19), by Dr. Edward C. Stone, plant physiologist at the California Forest and Range Experiment Station of the U. S. Forest Service, Dr. F. W. Went of the California Institute of Technology at Pasadena, and C. L. Young, Forest Service engineer of Arcadia, Calif.

The experimenters call what happens "negative transpiration." Ordinary transpiration is the loss of water from plants into the air. To test whether this process could be reversed, they put the tops of Coulter pine seedlings into a sealed plexiglas container and raised the relative humidity of the air inside the tube close to 100%. The roots of the seedlings were in soil which had been dried beyond the so-called wilting point.

Within a matter of hours, the plants had drawn enough moisture out of the air in the tube to lower the humidity appreciably.

The scientists think this process may occur during hot summer months when the humidity in the California mountains is sometimes 90%, yet there is so little rain the soil is below the wilting point for most plants.

They are not sure whether negative transpiration is the complete explanation in drought survival by certain plants, but they feel it may be an important factor.

One requirement given is that the plant must have strong leaves or needles. For negative transpiration to operate, the scientists believe, a plant must be rigid enough not to collapse when it becomes very dry.

Science News Letter, June 10, 1950

MEDICINE-AERONAUTICS

Predict Pollen Counts

➤ "IT is now possible to prophesy pollen counts instead of waiting for the count of the previous 24 hours."

This statement, welcome to hayfever sufferers and their doctors, was made by Dr. Herman A. Heise and his wife, Eugenia R. Heise, of Milwaukee, in a report to the Aero Medical Association meeting in Chicago.

For the past four year Dr. and Mrs. Heise, both pilots, have been taking light airplanes into the upper atmosphere for the purpose of discovering the migratory habits of the pollens and molds. Day and all night flights were made.

As many particles could be collected in the airplane in 30 seconds, they found, as could be collected by the ordinary method in 24 hours.

Some of the "important findings" given by Dr. Heise:

Most of the particles rise in the atmosphere to a height of over a mile during the daytime hours.

These particles are usually close to the earth in the early morning hours.

Fair weather cumulus clouds were found loaded with pollens and molds whereas the air between the clouds and above the clouds was practically free from particles.

The factor responsible for the upward distribution of particles is the" temperature lapse rate."

"Ordinarily," Dr. Heise explained, "the air becomes colder with increasing altitude and this condition allows particles to travel to heights over 6,000 feet since the warm air has a tendency to spiral upward.

"The cumulus cloud usually marks the top of an upward spiral and is therefore loaded with particles. On the other hand if the air is warm above and cold below, upward currents cease and the particles lie close to the earth. This condition is particularly marked in the early morning hours, especially when there is a ground fog."

The findings, Dr. Heise says, suggest an explanation for the "almost universal complaint" of feeling worse during damp weather and also make obvious why hayfever sufferers should keep their windows closed at night.

"The study furthermore," Dr. Heise stated, "throws much light upon epidemics resembling the October, 1948, Donora disaster."

Science News Letter, June 10, 1950

CHEMISTRY-PHYSICS

Germanium for Infrared Lenses Made in Purer Form

➤ A TECHNIQUE of purifying germanium, the chemical from which lenses for spectacularly improved infrared equipment can be made, was announced in Oak Ridge, Tenn.

Lenses made from germanium transmit invisible heat radiation. The germanium lenses will do this even though they are an inch thick and do not allow ordinary light to pass.

Prior to the discovery of the infrared transmitting qualities of germanium, materials that are attacked by moisture were used for optical work in the infrared region. During the last war important military applications were found for instruments using infrared radiation.

Dr. R. N. Hall of General Electric Research Laboratory found that germanium could be cooled with the direction of cooling controlled so that most of the impurities were concentrated at either end. Successive recrystallizations of the central sections remove impurities to the point where they are almost non-existent.

The extent of their removal is measured by the electrical conductivity, Dr. Hall told the American Physical Society meeting in Oak Ridge.

Science News Letter, June 10, 1950

AERONAUTICS

Jet Pilots Trained in Dark for Night Spotting

➤ JET planes streaking head-on toward each other at night close the distance between them at more than 1,200 miles an hour—20 miles a minute, a mile every three seconds. Against a backdrop of stars, brilliant at high altitudes, picking out the other's winking wing-tip lights is a split second, life-or-death decision for the pilots.

The U. S. Navy has begun using an astronomer's device, a specially-built star dome, to teach jet pilots quick night recognition. Radar can show another plane is approaching. But night-adapted eyes are still the best insurance in the last few seconds before a possible collision.

At the Naval Aeronautical Medical Laboratory in the Philadelphia Navy Yard, pilots go into pitch darkness in a domed canvas tent. Seated in an actual cutaway cockpit of a jet, they are suddenly surrounded with twinkling stars of the night sky. The pinpoints of light come from a special projector.

In front of the cockpit, painted pitch black, is a model of an oncoming plane. Its wing lights come on, very faintly at first, then brighter and brighter as the instructor turns a rheostat.

By the relative position of the lights, the pilot must decide the course of the approaching plane and veer his own plane away.

The Navy hopes also to learn from its new star projector just how a pilot's night vision is affected by the dim red instrument lights in his own cockpit.

A special assignment, the night vision installation was built for the Navy by Spitz Laboratories, headed by Armand Spitz, director of education at Philadelphia's Franklin Institute, and Nigel Wolff, his partner in the firm which builds the famed Spitz planetariums.

Science News Letter, June 10, 1950