PHYSICS—BIOLOGY

Electron Microscope Tried On Biological Material

STREAMS of electrons, instead of beams of light, may be useful in future micro-biological studies, to gain sharply defined pictures of structures not readily examined by means of ordinary light.

A preliminary study of the new technique has been reported to the British science journal, *Nature,* by Dr. L. Marton of the University of Brussels. In order to overcome the heating effect of the electron stream, Dr. Marton placed his specimen, a small leaf, on a fine copper screen, so that the metal might carry off the surplus heat. To protect the tissues of the leaf against injury by the electron bombardment, they were impregnated with a deposit of the heavy metal osmium.

Well-defined photomicrographs were obtained by the new method.

Science News Letter, July 14, 1934

MEDICINE

Fear Causes Convulsions In One Type of Epilepsy

FEAR is the basic cause of convulsions in a certain type of epilepsy, Dr. E. W. Lazell of the Veterans' Administration facility at Northport, N. Y., told members of the American Psychiatric Association. This type of epilepsy is called idiopathic and is independent of organic disease, he explained.

More soldiers were discharged from the A. E. F. in 1918 for epilepsy than for any other disability, in spite of the fact that epilepsy occupied eighth place among discharges from army camps in the United States in 1917 where epileptics were eliminated. Although the actual numbers discharged in 1918 were small, they were significant because most of these men had their first attacks in the service, Dr. Lazell pointed out.

Sixty-five of these men were given treatment consisting of mental re-education and one year later most of them were free from epileptic attacks.

Studying these cases led Dr. Lazell to believe that fear is always the immediate cause of the convulsions. He found that almost all of the men suffered from fear and hatred of the world which showed itself in a Bolshevik attitude towards society, a general feeling of profound inferiority, a hopelessness of being able to adjust socially, economically, industrially or personally, an absolute intolerance of restraint and a psycho-sexual impotence.

Dr. Lazell explained how fear caused these men to have attacks of epilepsy by pointing out that in the development of the race, fear has been associated with flight, anger or rage. Since these men could not run away from or fight the conditions they found intolerable, they escaped by way of epileptic convulsions which consist of fight or flight on a reflex or automatic level.

From his experience with these patients, Dr. Lazell is hopeful that many cases of epileptic convulsions developing in adolescence can be cured by mental re-education if this is begun at the onset of the convulsions.

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ECOLOGY

Desert Plants Defy Their Drought that Never Ends

See Front Cover

PLANTS of the Southwestern desert might well be amused—if plants could feel amusement—over the present grievous outcry caused by the drought's menace to the softer-bodied crops of the moister areas to the east. For desert plants have learned to live in a land cursed with a drought that never ends. They do not live entirely without water —nothing can do that—but they make the most of the scant brief rains and occasional cloudbursts that come into their lives, and during the long parched intervals just mark time.

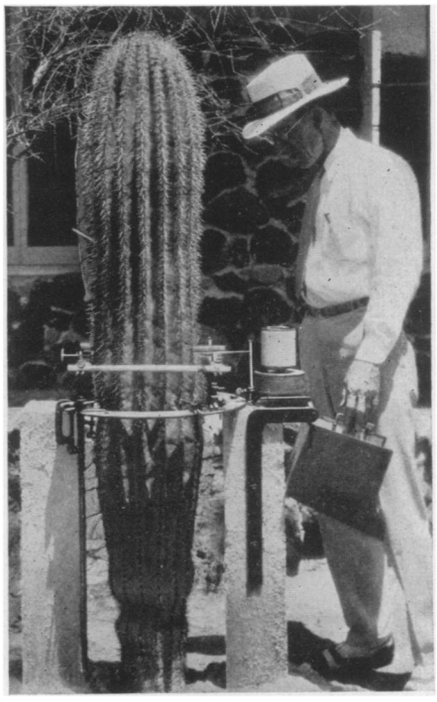
Desert plants and their ways of making a living in a hard land have been studied extensively by Dr. Forrest Shreve, director of the Desert Laboratory of the Carnegie Institution of Washington, located at Tucson, Ariz.

One route through the desert frequently traversed by Dr. Shreve in his plant-study tours follows the old Spanish "Camino del Diablo," or Devil's Highway, which lies along the U. S.-Mexican boundary between Nogales, Ariz., and a point a little below Yuma on the Colorado river. This was once the only road through the desert, and its dangers to human life are chillingly manifest through the many groups of graves that mark its course.

Yet plants live in this deadly land. Not many kinds of them, nor many individuals when all kinds are counted together. But they do survive, tough evidences of the tenacity of properly adapted forms of life.

Most numerous are the creosote bushes, low, rounded, grayish-green leaved shrubs. So much ground space must each have for its spreading wheel of roots to search for moisture, that they do not, as a rule, grow closer together than at ten-foot intervals in favorable areas, and they may be as sparse as a mere dozen plants to an acre.

So rigidly limiting to plant abundance is this factor of soil drought, that when the scientists find any kind of plants growing close together they immediately suspect something unusual about the



DOES A CACTUS PANT?

The instrument under the scrutiny of the Carnegie Institution scientist, Dr. Forrest Shreve at the Desert Laboratory, Tucson, Ariz., is designed to measure small changes in diameter occurring over short time periods, as the plant alternately gains and loses water.

BEAUTY FLAUNTED AGAINST DEATH

Lovely as the houris of Arabian desert legend, are the flowers of many species of cactus. They need not wait for kindly weather, but can open in the midst of desolation, for their needs are supplied from the stubbornly hoarded water in the thick, succulent joints of the stem.

soil conditions. Thus, when a thicket of mesquite bushes was discovered in the midst of a desert plain, they dug into the ground to find out why.

They discovered that the soil consisted of a fine alluvial clay, and that several streamways poured their water over the entire plain in the violent rains that come at intervals in summer. These mesquite bushes stood at a point where such water was concentrated underground from a wide area, and the moisture on which they throve so well remained nearly constant and wholly adequate to their needs at a depth of five to ten feet, no matter how dry and hot it was on the surface.

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A new rubber cement for tree wounds is said to retain its plasticity, so that it does not crack nor shrink away as the tree grows.

Calendar reform advocates are interested to find the government preferring the four-week month, thirteen-months-year system as the time unit for measuring industrial progress.

RADIO

To Make Survey of Delayed Echoes of Radio Signals

Owners of Short Wave Sets are Asked to Cooperate With National Bureau of Standards in Project

RADIO engineers are setting up the framework of a world-wide plan to trace the mystery of puzzling long radio echoes. The round-the-world echo is a well known phenomenon occurring one-seventh of a second after the original signal. This echo represents the time for the wireless wave to circle the earth. Long-delay echoes, however, may occur as much as three seconds after the primary signal.

Dr. J. H. Dellinger, chief of the radio section of the National Bureau of Standards, has asked Science Service to acquaint owners of short-wave sets with the plan for investigating these long-delay echoes, and thus aid the solution of the mystery of their origin.

The British Broadcasting Corporation is coordinating the survey on a world-wide scale. Ten thousand listeners in Great Britain are already entered in the project.

Two high-power high-frequency stations are transmitting special signals to facilitate observations by anyone who cares to listen with a short-wave receiving set. They are: GSB, Daventry, England, and HBL, Geneva, Switzerland (the League of Nations station).

GSB transmits a 1,000 cycle note on a frequency of 9510 kilocycles each Sunday, Tuesday and Thursday, from 3:25 to 3:55 a. m., Eastern Standard Time.

HBL transmits on 6675 kilocycles each Sunday, Wednesday and Friday from 6:00 to 6:30 a. m., E.S.T.

Each transmission, Dr. Dellinger explains, consists of a five-minute adjusting period, followed by the letters of the alphabet in Morse code at one-minute intervals. During the interval between signals observers are asked to listen for echoes and check the elapsed time with a watch having a second hand.

GSB can be picked up on an ordinary short-wave broadcast program receiver, but HBL requires an oscillating receiving set.

"In recording observations," Dr. Dellinger says, "listeners should give the identifying letter of the signal observed, the time to the nearest second at which the direct signal was heard, and the time to the nearest second at which the echo was heard. In addition an estimate of the relative intensity of the direct and echo signal, a description of the sharpness or apparent shape of the echo, and any pertinent information on interference, fading of signals, or other conditions of observations will be helpful in the survey."

It is hoped that data collected from thousands of individuals will help clear up the controversy over the cause of the long-delay echoes.

Dr. C. Störmer of Norway believes that there are streams of charged electric particles, the electrons, out in space some hundreds of thousands of miles from the earth's equator. These electrons, converging on the earth's magnetic poles, account for the northern lights. The long-delay echoes, by Störmer's theory, are reflections from such electron streams in space.

The other theory of long-delay echoes, advanced by Dr. B. Van der Pol of Holland and others, suggests that the echoes are due to a slowing up and a reflection of the radio signals from a peculiar distribution of ionization occurring in the ionosphere. The ionosphere is that portion of the earth's atmosphere 65 miles and more above the surface of the earth which is responsible for all long-distance radio transmission.

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GEOLOGY

High British Award Comes To American Geologist

DR. DAVID WHITE, eminent scientist of the U. S. Geological Survey, has been awarded the Boverton Redwood medal by the Institution of Petroleum Technologists in London, according to word just received in Washington. This is the first time that the medal, highest award of the institution, has been given to an American.

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