PLANT PHYSIOLOGY

Fungi, Thriving on Arsenic, Make Gases That Kill Men

FUNGI have appetites that put to shame that of the traditional billy-goat. They thrive on things that are rank poison to other plants and to animals. The astonishing appetites of some fungi for compounds of arsenic have furnished the latest problem for research by two mycologists of the U. S. Department of Agriculture, Dr. Charles Thom and Kenneth B. Raper.

Inspiration for the research was furnished by the occurrence of two deaths in Great Britain, apparently due to the action of these molds on arsenic-containing walls. The need for tangible information about these organisms as they occur in America was evident. Existing literature, considerable in amount but scattered, and some of it inconclusive, runs back through the past century or more. Eventually it was found that these fungi fed upon arsenic-impregnated wallpaper and other things, giving off poisonous gases that made human beings sick and even caused some deaths.

Dr. Thom and Mr. Raper cultivated the accused species of fungi, as well as some others not before suspected, upon nutrient media containing arsenic. From several of their cultures they obtained arsenical gases abundantly. Some other fungi grew on the arsenic-containing nutrients but did not produce any poison gases, these the experimenters designated as "arsenic-tolerant." Some fungi failed to grow. As a result of the study it is recommended that compounds of arsenic should not be used as preservatives for materials to be kept in enclosed spaces, where the gases generated might do harm.

This research helps answer the question why arsenic sprays and dusts can be so widely used against insects without general poisoning of the soil. "Arsenic" fungi were found abundantly in the soils examined and appear to be active enough to aid in disposing of the arsenic commonly applied. In special cases, however, damage to crops is known to occur under conditions where large applications of arsenic fall upon soils of special composition. These are still under investigation.

Science News Letter, May 27, 1933

MINING

Saw Replaces Explosives In Coal Mining

COAL is now being mined with a saw instead of being broken loose with explosives. The development of the coal saw to its present highly practical state has improved quality and value of coal, C. D. McLaughlin, superintendent of the Pioneer Coal Company, told the American Mining Congress.

It has also improved working conditions and safety in mines without any change in organization and supervision, and without displacement of labor. Large lump coal that stands handling and transportation well results from saw mining.

Science News Letter, May 27, 1933

NATURE RAMBLINGS by Frank Thone

ECOLOGY

Too-Dominant Parents

MOST TREES cast too dense a shade for their own seedlings.

In a well-grown forest of pine, for instance, you will find no little pine trees; in a closed stand of oak no young oaks. You will find the young stages of such trees as these associating with their elders only where accident or the lie of the land lets patches of sunlight down to the forest floor.

For many trees are not at all shade-tolerant, and these include especially the trees that are most apt to come first to a new area of treeless land, either after a fire, or when a stretch of lake bottom, for some cause or other, becomes dry land.

In an area like that of northern Indiana or southern Michigan, where once the most magnificent hardwood forests of this continent grew, the first trees to established a consistent and cohesive forest stand are usually jack pines. These have the double advantage of flying seeds, making their distribution and colonization easy, and of quite modest requirements in the matter of soil fertility, so that they will accept life where other tree species decline to take the chance, or fail to make a go of it if they do start.

But jack pines are trees of the sunlight, requiring full illumination from infancy onward. So when the first generation of trees has taken full possession of the land and stand with their arms locked to defend their ownership, there is not enough sunlight among their trunks for any little pines.

This is what gives trees of another kind their chance. Oaks can tolerate at least a certain amount of shade when they are young, so that under jack pines,

in the southern Great Lakes region, you will most likely find little oaks. The second generation of trees, therefore, will be oaks and not pines.

However, oaks play the same selfish game toward their own offspring that the pines played in their day. Oak seedlings need more sun than can be found in the shelter of oak branches. So again we find the children of strangers coming in.

This time they are a mixed people: a good many beechlings, even more little maples, and a smaller but still goodly number of hemlocks. These three species can stand a great deal of shade in their infancy. They take full possession of the oak undergrowth, and when the oak generation dies out they inherit that portion of the earth.

But here the cycle of parental overdominance ends. For the shade of the grown beech-maple-hemlock forest is not too dense for young trees of its own kind. Once a forest has developed to this "climax" stage it remains there forever, replacing itself generation after generation, unless fire or the devastating ax of the human invader intervenes.

Science News Letter, May 27, 1933

SPECTROSCOPY

New Spectra Are Explored By German

SPECTRA lying between the X-rays and the ultra-violet rays of 1200 Angstrom units, in which absorption spectra have hitherto been unknown, have been found by Dr. H. Beutler, Berlin physicist. The elements giving the newly discovered spectra are rubidium, caesium, cadmium and mercury.

Helium was exposed to a condensed discharge to produce light from 900 to 600 Angstrom units. The light source and the test vapor could not be separated from the vacuum spectrograph used by a window or other device because no material known allows these rays to pass through.

The new lines cannot be observed in emission but only in absorption. They are interpreted as arising from a change in the quantum numbers of an inner electron while the valence electrons remain unexcited and they thus represent a transition from optical to Roentgen spectra.

The experiments by Dr. Beutler are considered to be of fundamental importance in spectroscopy.

Science News Letter, May 27, 1933

OCEANOGRAPHY-SEISMOLOGY

Prediction of Tidal Wave Forestalls Harbor Damage

A TIDAL WAVE that traveled on schedule was reported by E. P. Leavitt, Superintendent of the Hawaii National Park, following a recent earthquake in Japan.

The schedule was arranged by earthquake experts after the earthquake itself was registered on the seismographs at the Kilauea Volcano Observatory in the Hawaii National Park, and also at Hilo and Kona, about ten minutes after it occurred in Japan. The Kilauea Observatory is operated under the supervision of Dr. T. A. Jaggar, head of the Hawaiian Volcano Research Association.

Seismologists A. E. Jones at the Kilauea Observatory, and R. V. Woods at Kona, immediately realized that a tidal wave might occur in the Pacific, and figured that such a water wave, traveling 450 miles an hour, would reach Hawaii about eight and one half hours after the earthquake.

Mr. Jones therefore notified the harbormaster at Hilo to look out for a wave about 3:30 p. m. that day, while Captain Woods in Kona informed officials at other ports that the tidal wave would reach them about nine hours after 7 a. m. The earthquake in Japan had occurred about 7 a. m, Hawaiian time.

With this information available, all of the Japanese sampans or fishing boats in the harbor at Hilo were moved out into the ocean to prevent wreckage in case of a large wave.

Intrigued by Mr. Jones' prediction, large crowds gathered at the seashore in Hilo as the hour of 3:30 approached. Mr. Leavitt reports that he and Mr. Jones, with policemen, patrolling cars and inspectors, went to the vicinity of the Wailoa River fish market to get a good view of the expected tidal wave as it came from the ocean. The wave struck within six minutes of the time estimated, and for about two hours rushed in and out through the Wailoa River. No damage was done at Hilo.

On the Kona side of the island, however, there was a maximum wave of about seventeen feet. A boat house belonging to Dr. Jaggar was moved about six feet by the waves and the water tank also was moved. Stone walls in the vicinity were washed out and shipping pens damaged. Here sampans, a motorboat, and several canoes were washed ashore.

Those watching the recession saw the water drop below tide level, revealing the barrier reefs and the red rocks beneath. Neighbors walked around picking up fish in the yards along the beach.

Superintendent Leavitt states that because of the warning given by Dr. Jaggar and his staff, all sections of the Territory were prepared for the tidal wave and so little damage was done. Had it not been for the scientific research investigations carried on by the Hawaiian Volcano Research Association, with the cooperation of the United States Geological Survey, serious damage might have occurred.

Science News Letter, May 27, 1933

Nicotine gets its name from Jean Nicot, who introduced tobacco into France.

A rattlesnake gets a new ring on its rattle whenever it sheds its skin, and that happens several times a year, depending on how well the snake feeds.

Placing a chemically-treated band of paper around an apple tree may bring death to as many as a thousand codling moth caterpillars.