CHEMISTRY

New Yeast Fermentation Yields More Glycerin

➤ GLYCERIN, needed in huge quantities for a thousand industrial purposes, is in short supply because of the scarcity and high price of fats used in soap making, of which it has long been a co-product. Its production directly from sugars by yeasts or other microorganisms, though possible, has been attended with some difficulties. Newest effort to overcome these is embodied in U. S. patent 2,416,745, issued to a team of three microbiologists, Prof. Ellis I. Fulmer and Dr. L. A. Underkofler of Iowa State College at Ames, and Dr. Richard J. Hickey of Terre Haute, Ind.

Ordinary yeast fermentation produces a little glycerin along with the ethyl alcohol. Addition of a soluble sulfite to the sugar solution upsets the fermentation chemistry in such a way that larger quantities of glycerin are produced. Carried on in an alkaline medium in the past, this production has still not been satisfactorily large because yeasts do not thrive on alkaline conditions. In the new process, the medium is acidified, making it possible for the yeast to work more efficiently.

Rights in the patent are assigned to the Iowa State College Research Foundation.

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ZOOLOGY

"Timid" Deer Prove Courageous in Defense

➤ DEER, proverbially timid and helpless, are capable of courageous fighting in defense of one of their own, even when the battle is hopeless. First-hand account of such a fight is presented by Victor C. Cahalane, U. S. National Park Service naturalist, in the *Journal of Mammalogy* (Feb.).

In Grand Canyon National Park, one autumn afternoon, he saw three coyotes pull down a deer. They were so preoccupied with their efforts to kill their victim that he was able to get within about 60 yards of the struggling group without being observed.

He had been watching the woodland tragedy for only a few minutes when a band of seven deer, six of them does, appeared on the scene. They approached slowly, until the coyotes, sensing their presence, formed a defensive front against them.

"The precaution was well advised," states Mr. Cahalane. "The largest doe took the offensive several times. Lunging into the midst of the coyotes, she struck vigorously with her front hoofs together. With ears laid back and eyes protruding, she was transformed into a veritable Fury. Each time that she singled out a coyote and charged, that animal beat a hasty retreat, sometimes backing off eight or ten yards."

It was in vain, however. The stricken deer had been hurt beyond any chance of recovery, and the bold female champion, with one younger backer who finally joined her, was in danger of being attacked on the flank. So the attempted rescue had to be abandoned.

Once successful in killing their victim, the three coyotes proved less cooperative than the deer had been in threatening them. They quarreled over the booty, with one lame-footed female bullying her two smaller companions and taking first rights to the prey.

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ENGINEERING

Gas Expansion Turbines Used in Oil, Gas Fields

➤ NATURAL gas expansion turbine engines are rapidly replacing reciprocating engines in gas and oil fields, the American Society of Mechanical Engineers in Tulsa, Okla., was told by Stephen Bencze of the Elliott Company, Jeannette, Pa., well-known as a manufacturer of gas turbines.

This gas expansion turbine is not the relatively new gas turbine engine. The gas-expansion type is driven by gas in the same way that steam drives steam turbines. The gas used to drive the turbine is not burned in the process. It is merely expanded by heat. After discharge from the engine it can be used for any of the purposes for which it was originally suitable.

Gas turbine engines, on the other hand, are powered by gases created by combustion from liquid or gaseous fuels. A new type will burn a very finely pulverized bituminous coal. The exhaust gases have no subsequent value.

The increasing use of the natural gas expansion turbine engine in oil and gas fields, to drive pumps, generators, fans and other equipment, is due to its economy and efficiency. Some of them are so constructed that they can be converted quickly into steam turbines if the gas supply is temporarily exhausted.

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IN SCIENC

HORTICULTURE

Fatal Orange Disease Is Found in Australia

➤ TRISTEZA, a virus disease highly fatal to sweet-orange trees grafted on sour-orange stocks, has been found in Australian citrus orchards, according to information received at the U. S. Department of Agriculture. It is apparently South African in origin, and got a foothold in the Netherlands Indies and South America. It received its name from the terrible destruction it wrought in Brazil: "tristeza" means "sadness" in both Portuguese and Spanish.

A disease having exactly the same symptoms but spreading much more slowly from tree to tree has been known for some time in California, under the name "quick decline." (See *SNL*, Feb. 22.)

Australian citrus men apparently consider the two diseases to be identical. The slower spread in California orchards may be due to the much more thorough spraying and disinfection schedule practised in them, which would presumably decimate and slow down the still-unknown insect carrier of the virus.

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PLANT PHYSIOLOGY

2,4-D Takes Plant Life By Internal Suffocation

➤ 2,4-D KILLS plants by robbing them of the ability to utilize oxygen in their life processes; in effect, it acts by a kind of internal smothering. Experiments pointing to this conclusion are reported in *Science* (March 14), by two Chinese plant physiologists, Dr. Y. L. Hsueh and Dr. C. H. Lou, of Tsing Hua University, Kunming, China.

Like many other compounds, 2,4-D was found to be a stimulant at low concentrations and a poison at higher ones. In its growth-stopping concentrations, it wholly prevented the germination of seeds that normally require oxygen for their sprouting. But the same concentrations only delayed, and did not prevent, the germination of rice, which normally sprouts under water without aid from the oxygen of the air.

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E FIELDS

ICHTHYOLOGY

It's a Girl Always For "Amazon Molly"

➤ "AMAZON MOLLY" never has any sons, only daughters. Not only that, but no matter who their father is, the youngsters never look the least bit like him, resembling only their mother.

"Amazon Molly" is a guppy-like fish native to Texas and northern Mexico. To scientists she is *Mollienesia formosa.* No male fish of the species has ever been found.

Dr. and Mrs. Carl L. Hubbs of the Scripps Institution of Oceanography in La Jolla, Calif., have during the past dozen years mated "Mollies" with males of 56 related species, breeding something like eight thousand young fish representing 20 generations.

No luck. All daughters. And not one looked like her Pa.

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BIOCHEMISTRY

New Biochemical Test Tells Exact Week of Pregnancy

➤ A NEW BIOCHEMICAL test for pregnancy, that tells with fair accuracy how many weeks have elapsed since conception, has been developed at the University of California Medical School by Dr. Ernest W. Page, who reports his results in *Science* (March 14).

The test is based on the presence in the blood of pitocin, one of the secretions of the pituitary gland. Something in the blood of pregnant women destroys this substance; and the farther pregnancy has advanced the more rapid is the rate of destruction. Dr. Page postulates the existence of a still-unisolated pitocin-destroying enzyme, which he has named pitocinase.

The test consists in adding to a blood serum sample from the prospective mother a small measured quantity of commercial pitocin and keeping it warm in an incubator. At intervals, fractions of the serum are withdrawn, chemically treated, and applied to reproductive tissue from a laboratory animal to test a biological reaction. The process is complicated, but in the hands of a sufficiently well-trained technician can tell the week of pregnancy, between the fourth and the sixteenth. Before the fourth, Dr. Page states, "there is no known pregnancy test which may be considered accurate." After the sixteenth week, methods already in use are more rapid and satisfactory.

As a simple "yes-or-no" test, Dr. Page makes no special claim for his method. He says, "Despite its economy, this method, when used as a purely qualitative indication of pregnancy, requires more time and skill in its present form than a Friedman or Aschem-Zondek test."

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MEDICINE

Emotional Epilepsy Is Frequent Sickness

➤ A LITTLE KNOWN type of epilepsy, often confused with petit mal and which is sometimes accompanied by acts of a violent nature, is much more prevalent than has been supposed.

Dr. Charles D. Aring, professor of neurology in the University of California Medical School, describes the condition, called psychomotor epilepsy, in *California Medicine* (Feb.).

He said that when recognized the disease is easily treated by the proper administration of either or both of the two anticonvulsant drugs, dilantin and phenobarbital.

Dr. Aring said that in this type of seizure an emotional disorder is a frequent manifestation. He said that it can be distinguished from petit mal epilepsy if physicians remember that the latter rarely occurs in adults and that it is usually of brief duration (five to thirty seconds), usually without movements or activities, except in or about the eyes.

He added that diagnosis is aided by electroencephalography, the study of electrical activity of the brain. A period of amnesia, whether long or short in duration, may in some cases be associated with this type of epilepsy.

"Any person experiencing rather short episodes of unusual behavior for which he has no memory might well be suspected of suffering from attacks of psychomotor seizures," Dr. Aring stated.

The physician pointed out that the condition raises the question of legal responsibility for acts, sometimes of a violent nature, which may be committed during the attack of psychomotor epilepsy. This seems to have been largely overlooked in the courts, he said.

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MATHEMATICS

Electronic Device Computes Engine Temperatures

➤ MECHANICAL ENGINEERS at the University of Wisconsin have invented an electronic computer which can "solve" the complex mathematical formulas by which engineers learn the temperature of exploding gases in engine cylinders.

The device makes the work now being done with diesel engines many times more accurate, quick and efficient. It has been developed as a scientific accessory to the electro-optical pyrometer which gauges the temperature of exploding gases within the cylinder of an expermental diesel engine. Work with the pyrometer may in the future result in the designing of new and better diesel engines.

Engineers formerly spent hours solving the equations which told the temperature of the diesel explosions, first taking a reading from two oscillographs, consulting a graph, and then plotting the mathematical result on paper and determining an "average curve."

The new device now plots on an oscillograph the temperature of an explosion or series of explosions. The oscillograph is photographed every few seconds by a special camera for permanent records.

The electro-optical pyrometer is an electronic thermometer. By comparing the intensity of two beams of light of different colors which emanate through a quartz window imbedded in the diesel cylinder wall the engineers compute a ratio which reveals the temperature within the cylinder.

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PHYSICS

Thin Tungsten Wire Is Invisible to Eye

➤ TUNGSTEN, the metal that is used for light bulb filaments, has been made into a wire that is so thin that a pound of it would stretch in a single strand 950 miles.

The wire is 0.00018 inch in diameter, and was produced by the Westinghouse Lamp Division for use in an amplifying tube for the Bell Laboratories.

One thousand feet of the thin wire, reeled on a bobbin, is invisible to the naked eye, and a 20-layer stack of the wire is about the thickness of a sheet of a newspaper.

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