

this acid in water, and spread upon polished iron, zinc, or even tin, or when these metals are placed in the acid, the acid acquires a fine blue colour.

7. Since the acid of molybdaena also assumes a blue colour from the last-named metals, it is easy to suppose that the acid of tungsten is nothing else than acid of molybdaena. But since in other experiments it behaves quite differently, our acid must also be of a different nature; because (1) the acid of molybdaena is volatile and melts in the fire, which does not occur with acid of tungsten. (2) The first-named acid has a stronger affinity for phlogiston, which is seen from its union with sulphur, and the change it undergoes on calcination with oil. (3) *Calx molybdaenata* does not become yellow with acid of nitre and is dissolved by it quite easily. With tungsten the contrary occurs. (4) *Terra ponderosa molybdaenata* is soluble in water, but not the same variety of earth united with our acid; and (5) acid of molybdaena has a weaker attraction for lime than our acid, because when *calx molybdaenata* is digested with a solution of the previously mentioned sal ammoniac tungsten is again obtained. The iron which is obtained from some sorts of tungsten ought to be regarded as accidentally pertaining to it.

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was isolated on special media from the tissue of a microscopically proven carcinoma of the human breast."

Further points to be determined are whether the micro-organism they have described causes the cancer, or whether it is caused by some virus or other germ present in the culture or by some toxin or other substance produced by the bacteria of the culture. It is possible that this culture is not the cause of all types of cancer, but of one group of them. Efforts to develop a serum, either curative or protective, will be a logical outcome of this research.

Investigation of the infectiousness of a type of cancer produced by bacteria as this one was in the guinea pig will also have to be developed.

One of the two physicians making the discovery is from New York while the second is from Philadelphia. They had worked under private research grants for about ten years before bringing their experiments to the National Institute of Health for critical testing.

The story of the development of one kind of cancer in a guinea pig is re-

vealed by daily records in the notebook of Dr. Engle.

These details are given in the Public Health Reports of the U. S. Public Health Service, in which the discovery is being announced to the world.

On Nov. 5, 1932, an adult female guinea pig, a discarded breeder, was inoculated in the mammary region with the germ culture obtained from a proved case of cancer of the human breast.

On Nov. 8, 1932, a condition termed infiltration was observed, by which the investigators could tell that the tissues were being affected.

On Dec. 22, 1932, isolated nodular areas developed in the region.

On Jan. 9, 1933, the nodules were seen to be enlarged and the inguinal glands were affected.

On Feb. 20, 1933, still further increase in size of the tumor and nodules was observed.

On Feb. 24, 1933, the animal was growing weaker.

On Feb. 28, 1933, the animal was very weak and was chloroformed.

Examination post mortem showed tumors in the breast region, inguinal region, kidneys, omentum and within the chest.

The pathologist's diagnosis was: Malignant adenoma with metastasis into the lymph nodes, omentum and kidneys. Commenting on what he found in the animal's body, he said:

"New growth has apparently arisen

ZOOLOGY

Life of Geologic Past Harvested From Sea Bottom

HARVESTS of "sea lilies," and other strange creatures of the perpetually dark ocean depths have been brought home to the Smithsonian Institution by a recently-returned expedition to the waters just north of Puerto Rico, where the deepest part of the North Atlantic Ocean is to be found.

These strange creatures, though called sea lilies, are really animals, relatives of the starfishes. Like them, they have a number of radiating arms, but the arms are branched, and the creatures are attached "bottom side up" to long stalks which anchor them per-

manently to the bottom. Sea lilies, or crinoids as they are also called, were once among the dominators of life on this planet, many millions of years ago. Now, although they are still numerous in the ocean depths, their leadership has been taken away from them by more advanced and active animals.

Upsetting to conventional ideas about cancer is this announcement from the National Institute of Health stating that Drs. Glover and Engle have succeeded in producing cancer in a guinea pig through the use of germ cultures from a human breast cancer case.

This may prove to be the most important news of today or even this year. It is certain that the claims of these two physicians, not government scientists but using Uncle Sam's facilities with the kindly cooperation of the Public Health Service scientists, will meet with opposition from other cancer researchers and practitioners. It is important that such experiments be checked and rechecked by independent experiments. But from such research beginnings have come the conquest of other dread diseases of the human race.

As yet there is no hope for cancer cure or treatment resulting from this work by Drs. Glover and Engle. Cancer patients will only waste time and money by bothering them. Probably there are several different kinds of cancer. The Glover-Engle discovery may mean that one kind of cancer is germ-borne and possibly communicable. But it is much too early to draw conclusions. We can only hope for fruitful results from the beginnings made.

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SPEED— AND ITS SIGNIFICANCE IN CHEMISTRY

by

Dr. Hugh S. Taylor

Professor of Physical Chem-
istry, Yale University

This address will be given
Friday, April 14, at 11:45
A. M. over stations of the
Columbia Broadcasting Sys-
tem. Each week a promi-
nent scientist speaks over the
Columbia System under the
auspices of Science Service.

BACTERIOLOGY

Bacteria Replace Yeast To Make Ancient Sacred Drink

BEEER made by the fermentive action of a special bacterial culture instead of the customary yeast, and drunk bacteria and all, is an excellent remedy for disorders of the digestive organs as well as a palatable drink. So states Prof. Paul Lindner of the Berlin Agricultural College, who made the discovery in the course of an endeavor to determine the identity of "soma," the sacred drink of the ancient Persians and Indians. Prof. Lindner's preliminary report is given in the German scientific weekly, *Forschungen und Fortschritte*.

"Soma" had long been supposed to be merely ordinary beer, with the addition of some kind of plant, not now identifiable with any certainty. But the health-giving properties of the brew are so lauded in the ancient literature that Prof. Lindner suspected that the well-being induced by it was more than the ordinary pleasant delusion of a successful *Bierabend*.

He had for many years been familiar with the Mexican drink "aguamiel," made from the juice of the century plant, and sometimes called "milk of the green cow" because it was drunk by the Mexicans while it was still white with its active fermentation. He had discovered that the fermentive organism in this drink is not a wild yeast but a bacterium, which he called *Termobacterium mobile*, or for convenience simply Tm. The same organism has been found in other fermented drinks produced in the tropics, and where it is present it predominates to the exclusion of yeasts.

Prof. Lindner suspected that it was the bacteria rather than the beverages they produced that brought about the excellent digestive and assimilative health of the drinkers. To test this theory, he centrifuged out about a tablespoonful of the organisms from some fermented liquid and swallowed them "straight." They did have a most beneficial effect, he reports.

He then undertook scientifically controlled brewing, using Tm bacteria instead of yeast. He found that the products of such fermentation were pure ethyl alcohol with a very little lactic acid, but no fusel oil, supposed to be the prime cause of the "Katzenjammer"

following indiscreet indulgence in yeast-fermented beverages. For one thing, the bacteria apparently cannot ferment malt sugar, but only glucose, and hence produce a beer of quite low alcoholic content, but high food value.

He induced a commercial brewery in Sweden and one in Vienna to produce bacteria-fermented beer on a moderately large scale, and with the cooperation of Dr. Leo Kaps of the Wilhelmina Hospital in Vienna tried it on a large number of patients. When given with the bacterial cloudiness still in it, the beer induced excellent conditions in the digestive tract. The same beer filtered, however, was merely an agreeable drink and had no therapeutic value.

According to the ancient Oriental literature, "soma" was so good that even the gods eagerly drank it out of the bowl of the moon, which was regularly refilled for them every month. The god of "soma" was the father of all the other gods.

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ASTRONOMY

Meteor Observed By Scientist on Train

FROM A SPEEDING railroad train, Dr. John Strong of the California Institute of Technology recorded observations of the unusual meteor of Friday, March 24, that lighted three states just before sunrise.

"The meteor appeared like a rocket," Dr. Strong told Science Service, "and it seemed to come up from the earth. Its trajectory was slightly arched and it was visible about five seconds. The first light was more intense than daylight and it lighted up three states.

"The meteor seemed to wobble, leaving a luminous tail about two degrees long. The meteor and tail appeared like a rocket of burning magnesium with red streamers of granular material. At the end of the trajectory overhead the meteor forked and turned red and then was no longer visible.

"The cloud of smoke about a fourth of a degree wide was luminous as if a searchlight were (*Turn to Page 222*)"

and animal material drifting down from the sunnier water strata above. Because the water is so cold in the depths, putrefaction goes on very slowly; the dead bodies are in permanent cold storage, waiting for submarine scavenger-beasts to come and eat.

Among the beasts that prey upon living things, down there in the everlasting dark, is a species of shrimp with folding razors for claws. It probably uses them for traps. Then there is a very thin eel with a dagger-like beak, and mollusks with shells like corkscrews.

The expedition which brought back this collection of strange abyssal animal life was sent out by the Smithsonian Institution under the leadership of Dr. Paul Bartsch, curator of mollusks. It had the use of the motor yacht *Caroline*, owned by Eldridge R. Johnson of Philadelphia, and specially equipped with apparatus for deep-sea work. It is the intention of Mr. Johnson and the Institution to cooperate in future expeditions for the complete study of physical and chemical conditions of the water and of plant and animal life of all the deep places of the North Atlantic.

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About 10,000,000 trees were planted last year, in connection with George Washington bicentennial celebrations.

Half a million ounces of gold used by American dentists through the year can be diverted into currency reserves, the dentists using platinum alloys instead, says a professor of dentistry at New York University.