

# In Science Fields—

## CHEMISTRY

### Morphine Analyzed In Search For Substitute

**P**ROGRESS in the search for a new, safe morphine was reported by Dr. Nathan B. Eddy of the University of Michigan at the meeting at Cincinnati of the Federation of American Societies for Experimental Biology.

Dr. Eddy is engaged in research sponsored by the drug addiction committee of the National Research Council. The object of the research is to produce, if possible, a substitute for morphine which will have that drug's valuable pain-relieving and sleep-inducing qualities but none of its dangerous habit-forming propensity.

The morphine molecule consists of a number of chemical units arranged to form a series of rings. Among these two units, known as hydroxyl groups because they are made up of hydrogen and oxygen, are appended to the rings. At present, Dr. Eddy is trying to find which of the units is responsible for relieving pain, which for quieting nerves and inducing sleep, and which for the sense of well-being that leads to habit formation.

He reported that the two hydroxyl groups have opposite effects in the action of morphine in the body. One of them increases the pain-relieving and other useful properties of morphine, while the other hydroxyl group decreases the same properties.

*Science News Letter, April 22, 1933*

## ENGINEERING

### Sparking Process Studied With Lichtenberg Figures

See Front Cover

**W**HAT IS an electric spark made of, is the question partly answered by the brilliant whirlygig figure on the front cover of this week's SCIENCE NEWS LETTER. The picture is one of several hundred made during research by Prof. C. Edward Magnusson of the University of Washington, Seattle. Prof. Magnusson's studies are yielding valuable information on the mechanism of the electric sparkover process.

Engineers studying the effect of lightning on high voltage transmission lines use such designs as that on the cover, known as Lichtenberg figures, to esti-

mate the voltage of tremendous discharges caused by lightning. With a special set-up they take a picture of the discharge on an ordinary photographic emulsion and the result is a Lichtenberg figure.

At the University of Washington the same procedure was carried out on a smaller scale in the laboratory. Instead of making the discharge in open air, Prof. Magnusson enclosed his apparatus in an air-tight envelope connected to a vacuum pump and photographed figures at very low pressures. He also studied discharges in a magnetic field.

The picture on the cover is one of the most striking taken. The dot at the top represents the positive terminal pressed against the photographic plate and the bottom dot, actually about three inches away, the negative terminal.

*Science News Letter, April 22, 1933*

## PHYSIOLOGY

### Female Uses Sugars And Starches Differently

**A**FUNDAMENTAL difference between the sexes in the way the body takes care of the sugars and starches of the diet was reported by Dr. H. J. Deuel, Jr., of the University of Southern California, to the American Federation of Societies for Experimental Biology.

Fasting adult male rats had more sugar stored in their livers than did the females, Dr. Deuel and associates found, while the females had more fat stored in the liver than the males. There was no difference in immature rats. Dr. Deuel was trying to find why women develop a condition of much greater acidosis during fasting than men do. Apparently it is because of their smaller store of sugar and larger store of fat.

The problem is important in connection with diabetes in which this kind of acidosis develops when the patient is on a sugar-free diet. It indicates that diabetic women might need a slightly different diet from diabetic men. When the ovaries were removed, female rats had as much sugar stored in their livers as did normal males, Dr. Deuel found. When these rats were given doses of theelin, a female sex hormone, the sugar stored in their livers was the same amount as that of normal females.

*Science News Letter, April 22, 1933*

## METEOROLOGY

### New Weather Station on Massachusetts Mountain

**O**N ISOLATED 2018-foot Mt. Wachusett in central Massachusetts, a new meteorological station has been established under the auspices of Blue Hill Observatory, Harvard University, in connection with the work of the International Polar Year. Unlike the Mt. Washington Observatory, however, there will not be resident observers. A meteorograph, designed and built by Prof. S. P. Fergusson to run two or three months without attention, is keeping the record of wind direction and velocity, atmospheric pressure, temperature and humidity.

The meteorograph and the exposed elements were prepared and adapted by F. B. Towle and his son, Philip, of Holden, Mass., who will also look after the station weekly.

The wind vane and three-cup anemometer, loaned by the U. S. Weather Bureau, are exposed a few feet above the mountain's fire tower and are connected to the pens which record the wind direction and velocity on the large drum of the meteorograph in the fire-lookout room. Under the eaves of the summit-house tower, the temperature and humidity elements are exposed in a louvered box to protect them from the full force of the gales that beset this summit. A coil of brass and steel is indicating the temperature, while a bundle of 150 strands of child's hair, prepared by Clifford L. Davis of Worcester, operates the humidity recorder.

*Science News Letter, April 22, 1933*

### ● EARTHQUAKES: WHAT ARE THEY?

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▲ This address will be given  
Friday, April 28, at 12:45  
P. M., over stations of the  
Columbia Broadcasting System. Each week a prominent scientist speaks over the Columbia System under the auspices of Science Service.