

the world's largest, he showed that the outer parts of the ring revolve more slowly than the innermost sections. If the rings were solid, the opposite would be true.

Imagine a small insect sitting on a rapidly spinning flywheel. If he is only a few inches from the axle, he is traveling through space much more slowly than if he is on the rim. But when separate bodies revolve around a larger one, such as the planets around the sun, or the moons around Jupiter, or Saturn; the farther away they are from the parent body, the lower is their velocity. When Keeler showed that the velocity of the various parts of Saturn's ring system is in direct accord with this law, the theory that the rings are made of small "moonlets" became a proved fact.

In addition to the rings, Saturn has at least nine moons, of which the two largest can easily be seen with a small telescope. The largest is about the size of the planet Mercury. It is called Titan, and is 2,625 miles in diameter. Our earth's solitary moon has a diameter of only 2,160 miles.

During October our moon goes through its phases as follows:

CHEMISTRY

Synthetic Rubber Made Equal To Natural Product

THE LATEST advances of American scientists in the laboratory battle to make this country independent of the importation of rubber from foreign sources were reported to the meeting of the American Chemical Society at Chicago. The creation of better artificial rubber substitute materials and tests of real rubber processed from plants raised in the Southwest were described. A method of strengthening inner tubes to make them more nearly blowout proof was also given.

The first synthetic materials to equal the elasticity and steel-like strength of natural rubber have been made in the laboratory of the DuPont Company at Wilmington, Del., Dr. Wallace H. Carothers, research chemist for this concern, revealed. These new materials also resemble rubber in their ability to crystallize when stretched, yet return instantly to their original amorphous con-

dition when allowed to contract. Though not fully equal to natural rubber in most respects, the new product was said to be very greatly superior in some characteristics.

Dr. Carothers explained that this "artificial rubber" was made possible by chemical developments of the past three years that provided a new method of attack on the problem.

"Starting with vinyl acetylene, a compound made available by discoveries of Dr. J. A. Nieuwland of Notre Dame University," he explained, "our chemists have synthesized a large number of new compounds closely related to isoprene. At least two of them, chloroprene and bromoprene, are enormously superior to any other materials as starting points for the synthesis of rubber."

How to improve natural rubber to make its strength the same at any tem-

perature from the freezing to the boiling point was told by A. A. Somerville, and W. F. Russell of the R. T. Vanderbilt Company, New York City. Commercial inner tubes, for example, become greatly weakened at high temperatures, they explained. This is the cause of frequent blowouts in hot weather and on long drives.

"By reducing the amount of sulfur used for vulcanization," their paper states, "to about one half of one per cent. on the rubber (two and one half to three and one half per cent. is the amount commonly used,) and using suitable accelerators in sufficient amount it is possible to make vulcanized rubber that shows as high tensile strength at one hundred degrees Centigrade as it does at room temperature."

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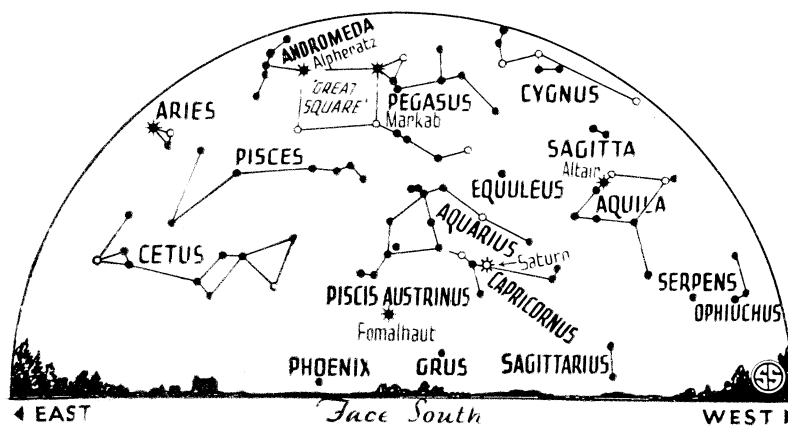
PLANT PHYSIOLOGY

Swamp Plants Grow Better When Roots Get Oxygen

SWAMP PLANTS, commonly supposed not to need air for their roots, nevertheless thrive better in aerated soils. It was demonstrated by recent researches of Dr. B. Elizabeth Dean of the University of Iowa.

Dr. Dean planted cattails, arrow-leaf, swamp hibiscus and several other wetland species in various types of soil, giving some the benefits of aeration around their roots and keeping the others in an air-lacking condition. All the plants grew, but the root-aerated ones did better than the others, developing more stem and leaf growth as well as lustier, deeper-growing roots.

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SATURN RIDES THE GOAT

Ringed Saturn holds primacy in planetary honors in the evening skies of October. The brilliant full moon of the third will be the "harvest moon."