BOTANY

NATURE RAMBLINGS

Tulip Tree

➤ ALL THROUGH the whole eastern part of the United States, and well into the West where men have seen fit to plant them as ornamentals, tulip trees are coming into bloom. It can be spotted as a somewhat rough-barked but tall and stately tree, big as a cottonwood, with a vast bed of tulips plucked up off the ground and scattered carelessly about over its crown.

Although the gorgeous magnolias of the South do not venture very far north, the tulip tree, a fairly near relative, upholds the family traditions through a wide stretch of country well above the Mason-Dixon line. West of the Mississippi it occurs naturally little if at all, but will thrive as a cultivated tree as far west as one can grow six-foot cornstalks, and it deserves wide acquaintance. It does receive full appreciation in the cities of the East, however.

Its only drawback in the windy stretches of the prairie states is that winter storms will sometimes break off branches, for the wood is short and rather brittle.

Though this weakness of its wood precludes it from consideration as a first-rank hardwood, the tulip tree still has a useful place as a timber producer. Its fiber is even and smooth and rather soft, which makes it nice material for the veneer knife. For this reason, and because it is a fast grower, the tulip tree is being cultivated to some extent on cut-over lands as a regular timber crop.

The tulip tree is also variously known as tulip poplar, yellow poplar, whitewood and fiddle-tree. The latter name is in recognition of its very odd leaves, which with their squared or slightly bifurcated ends and constricted sides have some faint suggestion of a violin shape about them. The Greek name which Linnaeus gave it, however, is a bit of classic poetry to the sensitive ear—*Liriodendron*. It means "lily tree."

The beautiful flower-cups whence the tree gets both the commonest of its common names and its classical title are of about the size and shape of tulips, and have colors that no tulip need be ashamed of. In their internal structure, however, they are quite different. Instead of the triple arrangements of stamens and pistil parts, they have indefinite numbers arranged in spirals. This is a mark of relatively primitive rank in the evolutionary scale of plants; and, indeed, the tulip tree is placed by botanists very near to the front of the book, along with its magnolia relatives.

Science News Letter, May 7, 1955

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METEOROLOGY

Cosmic Rays Charge Rain

➤ COSMIC RAYS zooming down through the atmosphere cause ions that give raindrops their electric charge, the National Academy of Sciences was told.

Dr. Ross Gunn of the U. S. Weather Bureau outlined his theory of electrification of clouds and raindrops to the meeting of the nation's top scientific body in Washington.

It is the first simple explanation for the previously puzzling facts concerning atmospheric electricity.

His theory is based partly on studies made with a giant weather globe, 60 feet in diameter, built near Houston, Tex., in which artificial clouds were made and carefully examined under controlled conditions.

Radioactive material in the earth's surface, even the tiny amount breathed out by people, adds to the ions that cause atmospheric electricity, Dr. Gunn pointed out.

When rain falls, it usually has about an equal mixture of positive and neagtive charges. The total amount of this electrification is very high, about 7,500 volts per inch. This is a "very large part"—about one-fifth of the total charge that air can stand without discharging, or breaking down.

Dr. Gunn computed statistically how a mixture of ions, electrically charged atoms produced by cosmic rays, would affect tiny rain droplets.

In a cloud, these ions would hit the droplets about once every five to ten seconds, the chances being equal that the charge given to the droplet would be positive or negative. The electric field continues to build up from ion collisions until it modifies the thermal energy of the cloud droplets.

When the cloud finally becomes unstable, Dr. Gunn said, the electrified cloud droplets collide and join together to form drops that grow in size, adding up electric charges at the same time. About half the growing raindrops will have high positive charges, the other half, high negative charges.

This drop growth is essentially the same process as that by which the droplets originally picked up electric charges from the ions, but the energies involved are about 1,000 to 3,000 times higher, Dr. Gunn explained.

Another important result he reported is that thunderstorms occur in clouds that never reach the freezing level.

Science News Letter, May 7, 1955