

BOTANY City Trees Have Hard Life

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Tree-planting time is upon us. In suburbs and residence towns, wherever there are new streets hopeful landowners are setting out young shade trees by the mile, while city foresters face the harder problem of finding green warriors against the hard conditions man has created in the brick-paved deserts he chooses to live in.

When one considers what the average street tree is up against it is really a wonder that we have any of them left. As a matter of fact, all that we have left are the tough ones, and there is much to indicate that in the modern paved city, most of these will be short lived. When growing under natural conditions a tree has unpolluted air, soil that is not only unpaved and untrodden, but deep, soft, and annually enriched by the deposit of dead leaves. You know how black and rich the top soil is in the forest. A street tree, on the other hand, has its leaves choked by smoke. If you doubt this, take a leaf from some street tree some day when there has been no recent rain and rub it on your cuff.

But it is not only the soot in smoke that does harm, but the invisible gases and fumes. A recent contribution to these fumes is the exhaust from automobiles. Then the street tree is lucky if it has nine square feet of soil around it that is not paved. The pavement prevents aeration of the soil, keeps away water, and above all prevents any of the natural food supplied by the decaying leaves from returning to the soil. To a less extent, yard and park trees suffer from the same difficulties. They breathe the same smoke-laden air, and while park and yard are not paved the grass is cut away and the leaves raked up and removed, and the soil will usually be found to be hard, dry and lacking the necessary foods for vigorous tree growth.

Street, yard and park trees suffer from many specific diseases and also from injuries, but these are unimportant compared with the malnutrition which results from lack of the natural food supplied under forest conditions by the falling leaves. In the case of park and yard trees, this difficulty can be met to some extent by fertilizing the ground, but the

conditions under which street trees live are so severe that the best way to meet the problem is to plant only trees that are hardy and smoke-resistant. The sycamore is a typical example of this type and will probably be planted increasingly as time goes on.

In dealing with trees in the yard and park, always look ahead twenty-five years. If a tree is obviously declining and has only a few years to live, it is far better to cut it down and replace it with a young and vigorous tree, unless, of course, it has historic interest or some other special individual value. In yards and parks there should always be understudy trees growing up ready to take the place of the older trees. It takes time to grow trees.

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PHYSICS New Relay Most Sensitive

Mechanical window displays that automatically start to operate when a person stops to watch, lights of a city that may be turned on by a single drop of rain, or costly jewels, loosely laid around and apparently unprotected, but arranged so that a bell rings loudly when a prospective crook's hand draws near, are now a possibility as the result of a new electric relay. The device was invented by D. D. Knowles, research engineer of the Westinghouse Electric and Manufacturing Company.

It is known as the Knowles grid-glow relay, and resembles a radio set vacuum tube in appearance. When properly connected, a billionth of a watt of electrical energy, about one-fortieth the amount of energy exerted by a fly climbing an inch in a second, is sufficient to control the flow of a current a hundred million times as great, and this current, in opening or closing another relay, can control currents as high as twenty-five amperes, as much as used to operate large motors.

Though exhausted of air, the tube contains neon, argon, or some similar gas which is chemically inert. Like a radio tube, the parts within are an anode, a cathode and a grid, but there is no filament. When the anode and cathode are connected to the two terminals of a circuit of about 440 volts, no current flows, because there is an electrical charge built up on the grid which blocks it, as long as the grid is insulated. But if the grid be connected to the ground, the blockade is lifted, and the current flows, and operates any device connected in the circuit.

In the demonstration made show-

ing how jewelry may be protected, a watch was laid on a plush cover under which was a piece of tinfoil connected to the grid of the relay tube. As soon as the hand was brought near the watch, and the tinfoil, the electrical charge on the grid is removed. The tiny amount of electrical energy jumps from the tinfoil to the hand. The grid being discharged, the 440-volt current flowed through the tube, and operated any device in the circuit. A drop of water falling on two fine wires, a photoelectric cell sensitive to light variations, or a flame under two parallel wires, were substituted for the hand and tinfoil arrangement. Possible applications of the device suggested by Mr. Knowles are to guard exhibits in stores and museums, turn lights on and off at nightfall and daybreak, warn of thunderstorms and give alarms when intruders enter doorways or halls.

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CERAMICS Chinese Art Languishing

Though chinaware and porcelain comprise one of China's gifts to the world, this famous industry has languished since the beginning of the Republic, according to "China, a Commercial and Industrial Handbook," just issued by the U. S. Department of Commerce.

The patronage of the emperors did much to encourage manufacturers who took personal pride in the production of their porcelains but unfortunately without the stimulus of imperial interest, the industry seems to have slumped and shows great lack of enterprise. There were several imperial potteries under the old regime, the chief of which has been located at Kingtehchen in the Kiangsi Province since 200 A.D.

Exceedingly beautiful china is still made, according to Commercial Attache Julean Arnold, but it is difficult for tourists to make satisfactory purchases owing to the limited supply of pieces kept on hand. China possesses not only the skilled potters but plenty of raw material in the shape of high quality kaolins and clays, so that when the political order of the country becomes more stabilized, it is sure to become again an important factor in the ceramic industries.

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It is believed that the rate of reproduction of some simple-celled living creatures is dependent upon the wave lengths of light they receive.