



### "WITH WHISKERS"

*The stem of this plant grew a perfect beard of short roots when the soil in the pot was treated with a hundredth of a gram of indole butyric acid, one of the synthetic growth-promoting substances.*

chromosomes double up is the chance of getting hitherto impossible hybrids that will produce offspring. As a rule, one can get only sterile hybrids between two plants or animals that are not closely related, like horse and donkey, or cabbage and radish. This is because the chromosomes of the alien cells have a hard time finding proper mates when crossing takes place.

But if you can bring into the picture these giant germ cells with double or quadruple chromosome numbers, it is much more easily possible for these difficult crossings to be made. Once made, it is again more easily possible for them to continue true to seed.

This does not mean that completely unrelated plants can now be crossed. We are not going to see such fanciful hybrids as strawberry with watermelon or endive with cucumber. But scientific Cupids may try to arrange such cousin-matings as tomato with eggplant, or wheat with a wild grass, or lettuce with endive. Results are apt to be interesting, and some of them may be highly valuable.

The botanical building at the University of Chicago has its top floor built as a greenhouse, but no plants are ever grown there. When it was built it seemed a fine idea, but the plants just

acted queer and then died. So they had to give it up.

But members of the botany department were determined to find out what ailed the place. They traced the trouble very quickly to illuminating gas used in the laboratories on floors below. Then they took the gas to pieces chemically, to see what made it so poisonous.

They discovered that the poisonous part of the gas was a compound known as ethylene, found in almost all natural and artificial gas. A number of other compounds, some of them related closely to ethylene, others not, were found to have similar effects. Many of these worked also when they were dissolved in water reaching the plants.

But finding out that ethylene and other compounds were plant poisons did not close the case at all. The plant physiologists knew, from medical experience, that very small doses of poison can be useful as tonics or stimulants.

Continued experimentation showed that these poisonous gases could be put to work in much the same way. And now they do work, in hundreds and thousands of places, affecting large quantities of fruits, vegetables, flowers, and other marketable plant products.

Gas treatments have been found valuable, for example, in bringing the bright hue of ripeness to oranges and

other citrus fruits, which are green-skinned when they are picked. Bananas, also shipped green, are made beautiful for their market debut with a touch of the same magic gas. Celery is blanched. Dormant cuttings of many species of flowers are made to awaken, like Sleeping Beauty in the story, by the invisible stimulus.

It develops that ethylene is a normal product of the life-processes of plants themselves, particularly during the process we call ripening. This explains the "mysterious" power of apples in a cellar to prevent sprouts on potatoes stored in the same bin. The apples give off enough ethylene to discourage the sprouts. Experiments in Germany have even shown that apples will stunt the growth of seedlings, cause leaves to fall off sensitive plants, etc., all through the power of their internally-generated ethylene.

The late G. K. Chesterton once wrote a book of essays which he titled "Tremendous Trifles." He could have found plenty of material in the plant world to write about. Every day we are finding some new thing, trifling in size or quantity, but tremendous in its effects on the green life round about us, and therefore in the end on us also, who are dependent on plant life for the maintenance of our own lives.

*Science News Letter, January 22, 1938*

#### ECONOMICS—SOCIOLOGY

## Millions of Americans Fail To Affect National Economy

ONE out of six people in the United States could disappear tomorrow without affecting the income of the nation, it was revealed before the American Association for the Advancement of Science in an inquiry that provides preliminary blue-prints for more effective use of human resources and manpower.

Some 15,000,000 to 20,000,000 people live at a subsistence level and take a very meager part in economic life, a paper communicated by Frederick Osborn of New York City declared.

These people, representing probably some of our finest stocks, are located in the Appalachian Highlands, the Ozarks, the cut-over regions of northern Michigan, Minnesota and Wisconsin and they include marginal farmers and sharecroppers in the South and the western

wheat areas. The unemployed in our cities are also in the class of our population that neither produce nor consume in the sense of any broad exchange of goods.

One of the major tasks of society is to make these people into effective producers and consumers.

"If all our people could be brought to the level of the 25 per cent. who are at present our largest consumers, our total economic activity could be increased manifold," Mr. Osborn declared.

Scientists were called upon to assume social responsibility for the consequences of their inventiveness, lest they find themselves in the subservient position of German scientists. Dr. Eduard C. Lindeman of the New York School of Social Work warned that "a technological age cannot afford to have its

values set by persons unfamiliar with the foundations of science and technology.

"Science must become much more forthright in accepting its social responsibilities and especially the responsibility

for understanding basic human needs and for releasing the unused energies of men," said Dr. Lindeman. "Education must become more scientific, both with respect to its methods and purposes."

*Science News Letter, January 22, 1938*

## PSYCHOLOGY

## Youth at the Wheel Found Skilful But a Great Hazard

**Drivers Between 16 and 20 Kill Twice as Many as Equal Number of Average Motorists; Recklessness Blamed**

**T**HE FLAMING younger generation stands condemned as the greatest group of mass murderers in America. The weapon is the automobile.

Although including more highly skilled automobile drivers than any other age-group, 100,000 drivers between 16 and 20 years of age kill nearly twice as many on the road as the average 100,000 drivers.

Accident rates for those below 25 years of age are so high that bringing down that age group's accident rate to the general level would save nearly 8,000 of the nearly 40,000 killed each year on the American highway and street.

These challenging figures were presented to the American Association for the Advancement of Science by Dr. Harry M. Johnson, research associate for the Highway Research Board, Washington. Young men between 19 and 21 years of age are apparently the worst menaces on the highway, Dr. Johnson declared, pointing to a chart which indicated plainly that young men just approaching their majority are responsible for many more accidents per 100,000 drivers than any other group.

Middle-aged men between 46 and 55 may be a bit slow as compared with

their younger traveling mates, but they are involved in relatively far fewer accidents, he continued.

Knowledge of their own skill and consequent willingness to take chances beyond their own capacity to meet were tentatively blamed by the speaker as the factor chiefly responsible for the great proportion of accidents among youthful drivers.

"Some skilful drivers, relying on their agility and alertness, may enter hazardous situations that are a little beyond their ability, whereas less skilful drivers, being aware of their weaknesses may stay out of them," he concluded.

Nearly 30,000 drivers registered for the six years from 1931 to 1936 inclusive in the state of Connecticut were the experimental raw material, study of which led Dr. Johnson to the conclusions he revealed. Fatal accident figures were compiled from a study of 2,165,241 drivers over a period of five years. His work is being carried out as a joint project of the Highway Research Board and the U. S. Bureau of Public Roads.

Nearly two-fifths of all accidents, Dr. Johnson pointed out, are caused by a small number, less than four per cent. of the drivers, indicating that a driver who has one accident is likely to have others. Accident-repeaters, as he termed them, are a serious highway menace who do much to increase death and destruction out of proportion to their numbers.

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Judging by recent tests, it is harder to see letters than numbers on automobile license plates.

Egg white foam, once a waste by-product of the egg-drying industry, can now be saved as dried egg white, by means of a new process.

## PHOTOGRAPHY—PHYSICS

## Lightning Strokes Caught By a Rotating Camera

**See Front Cover**

**L**IGHTNING does strike twice and more than twice in the same place, it is demonstrated by the photograph appearing on the front cover of this week's SCIENCE NEWS LETTER. Eleven separate strokes make up what appears to the eye as a single lightning flash.

The strokes, which come so fast that the human eye cannot distinguish them, were photographed by General Electric Co. scientists. The Empire State building in New York City is the target.

The flash as the human eye sees it (main flash in center) was caught by one camera lens, while another one, rapidly rotating, caught the eleven separate strokes. The first one is the streak at the right, the last one is at left. The flash took .36 seconds altogether.

*Science News Letter, January 22, 1938*

## ● RADIO

January 27, 4:00 p. m., E.S.T.

**WHAT'S NEW IN CHEMISTRY**—Dr. Harrison E. Howe, editor of *Industrial and Engineering Chemistry*.

February 3, 4:00 p. m., E.S.T.

**THE USEFUL SOYBEAN**—Dr. Henry J. Knight, Chief of the U. S. Bureau of Chemistry and Soils.

In the Science Service series of radio discussions led by Wadson Davis, Director, over the Columbia Broadcasting System.

## PAVLOV AND HIS SCHOOL

**The Theory of Conditioned Reflexes**

By Y. P. FROLOV

This fascinating and important book provides much biographical information concerning the great Russian founder of the School of Conditioned Reflexes, together with a clear and concise account of the theory of conditioned reflexes. There is also an account of Pavlov's predecessors and of the circumstances which led to the evolution of his method of investigating nervous activity. The author, who was one of Pavlov's own pupils, describes actual experiments and glimpses of the life of the workers in the laboratory. \$4.00.

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