

"We believe that this ushers in a new era in feeding plants," Prof. Lipman declared in commenting on the experiments that as yet have been reported only to the National Academy of Sciences. "We can ignore the soil, completely and feed directly to the tree the nitrates, phosphates, calcium and magnesium salts necessary to its growth. Such direct injection of the nutrients allows us to avoid the troubles caused by the complexities of the various chemical reactions of the soil."

Although experiments have been performed on apricot, plum, lemon, orange and pear trees and on barley and wheat during the past two and a half years, no announcement of results has heretofore been made.

Trees can be pepped up as well as fed by the injections. Prof. Lipman says that calcium and potassium salts have a stimulating effect when injected. Large quantities of solutions can be absorbed by the trees. One pear tree was persuaded to soak up over 60 quarts of chemicals in 24 hours.

The insect menace is to be combated by the new injection method. Prof. Lipman plans to experiment with solutions of chemicals that are known to be toxic to injurious insects but not harmful to the trees. The trees injected with the poisonous liquid will become poisoned bait to marauding scale insects or other harmful pests and thus will become self-protective.

NOISE OF ELECTRONS HEARD BY HUMAN EARS

The smallest thing in the universe has made a noise and man has listened to it. Scientists have previously discovered and measured the electron but today Dr. A. W. Hull of the General Electric Company's research laboratory and Dr. N. H. Williams of the University of Michigan reported to the American Physical Society meeting that they have been successful in listening by radio to movements of electrons, the smallest particles of matter.

Using a vacuum tube radio amplifier, magnifying the sound a hundred thousand fold, the rain-like blows of many electrons on the plate of the tube produced a roar that sounded like Niagara in the distance. The sound is caused by bombardment of the plate by electrons, released from the hot filament. It is these electrons, which carry the current and which make the operation of the tube possible. Dr. Hull therefore believes the noise is a fundamental property of electron emission, a characteristic of the electron. The noise, due to the electrical oscillation which is set up by the impacts of the individual electrons on the plate, is known as the Schrot effect and was predicted on theoretical grounds by Dr. Schottky of Berlin.

Listening to the electrons was merely incidental to more technical researches undertaken by Drs. Hull and Williams. They were primarily engaged in measuring the electrical charge on the electron.

This was first accomplished with great accuracy by Dr. R. A. Millikan of the California Institute of Technology at Pasadena and winner of the Nobel Prize for physics last year. Drs. Hull and Williams were attempting to obtain the same results by a method differing from that used by Dr. Millikan.

Dr. Millikan's method of measuring the charge of an electron is based on the influence of gravity and of electric charges on minute oil "droplets". These droplets are so small that the effect of gravity causes them to fall only a quarter of

an inch in ten seconds - they are about three hundred-thousandths of an inch in diameter and are observed in a powerful beam of light with a small telescope. They are then seen as specks of light against a dark background.

In the formation of these small drops with an atomizer, occasionally one becomes charged by friction; that is, it may carry an additional electron. If then the droplet is between two electrically charged plates it will behave differently from the uncharged particles, Dr. Hull stated. Those which are not charged will fall. The charged particles will be attracted to the positive plate. By the use of the proper voltage between the plates, these charged particles can be made to fall more slowly, held stationary, or caused to move upward. If two electrons, instead of one, are held by the droplet, the effect is doubled.

Doctors Hull and Williams have measured the charge of the electron in a different way, by means of the Schrot effect, and have opened a field for research which promises to add to the knowledge regarding the electron and its properties. Previous attempts were made by German scientists to make the electron audible, and to measure the charge of the electron by this method. Only approximate values were obtained, however. By the procedure used by Drs. Hull and Williams it is possible to obtain values of high accuracy. The measurements thus far made by this method give a value for the charge of the electron within one half per cent. of Dr. Millikan's value. The scientists made the measurements while working with radio frequencies and studying vacuum tubes.

Atoms have also been made audible within the past few weeks. It was recently announced that a device had been perfected in the research laboratory of the General Electric Company that reproduces in a radio loud speaker the rustle made by bringing a magnet close to a bar of iron and thus making groups of atoms stir themselves.

SCIENTISTS SEEK MEANS TO LIMIT TIMBER WASTE

This is the story of the House that Jack Didn't Build.

These are the woods where the trees used to grow that would have furnished the lumber for the house that Jack might have built. The woods are the areas of virgin timberland in the United States. They are two-thirds gone now. Of the original 681 million acres of forest in the eastern United States less than a tenth now remains uncut; the West fares better, but badly enough, for nearly half of its original 141 million acres also are gone.

Destruction recorded in such tremendous figures is engrossing the attention of the National Conference on the Utilization of Forest Products called by the U. S. Department of Agriculture. Representatives of federal and state governments, of the leading universities and forestry schools, and of the wood-using industries, are getting their heads together over the problem of the House that Jack Didn't Build.

Not only is the ax eating fast and deep into our remaining woodlands; but it is accompanied and followed by waste, in a dozen devouring forms. Fire, decay, insect injury, all take their toll of the trees even before the woodsmen approach. How much, is not accurately known, but the losses are large.

Then when the woodsmen do come, the waste continues merrily. Department of Agriculture figures show an average of 28 per cent. of any given stand of timber