novel improvement though it is quite in the spirit of the activities at M.I.T. Committees are at work testing new designs for fluorescent lights and improving the acoustics in classrooms and lecture halls. The results of these research activities will prove their worth as soon as they are put into effect throughout the school.

changes versus professional subjects. The

Changes foreseen

Since January, 1947, when it was

Field testing of promising fungicidal formulations, including 'Parara' formulations, for control of tomato late blight.

Questions College Men ask about working with Du Pont

What are the opportunities for research men?

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THE TECH

Friday, January 9, 1945

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DU PONT CHEMIST

For Students of Science and Engineering

DU PONT CHEMIST

Rubber accelerators lead the way to new agricultural fungicides

Vulcanization accelerators for rubber and agricultural fungicides would seem to have little in common. But the wide variety of interests of men in the Du Pont organization sometimes result in outstanding developments from such apparently unrelated products.

A rubber chemist suggested to a plant pathologist the derivatives of dithiocarbamic acid, H(S)(C(S)NH)(CH2)NH(S)C(S)H, parent substance of a well-known group of rubber accelerators act as antimicrobial agents. This suggestion was based on the possibility that sulfur combined in this form might be more effective than free sulfur, a recognized insecticide.

Entomologists and plant pathologists investigated the fungicide, as well as the inorganic properties of this group. One of the first compounds tested, sodium dithiobisdiuronate, CH2N-S-S-N(CH3), even in dilutions of 1:1000, was found to be a powerful fungicide, but somewhat injurious to plant life.

This led to a systematic program of research including other metallic salts, the alcohols, propyl, butyl, phenyl, and other aryl derivatives of the dithiobisdiuronate and thionine, mono, and dimaleimides, and the related compounds made from ethylenediamine and monophosphate. In this phase of the work, organic chemistry played an important role by suggesting various derivatives and preparing them for tests. Later research showed the best results where proper dispersion and adhesiveness of the substance to the plants were important; the skill of physical chemists was called upon.

In general, the compounds of greater chemical stability were found to be less effective. Fungicidal efficiency diminishes with increase in size of alkyl radicals, and as aryl radicals were introduced for alkyl groups the usual situation developed that with the exception of one compound (dibenzothiazole), the best and simplest products tested, the methyl derivative, proved to be the best fungicide.

Iron and zinc dimethyldithiocarbamates, Fe(S)(C(S)NH)(CH2)NH(S)C(S)H, or Zn(S)(C(S)NH)(CH2)NH(S)C(S)H, are new salt solvents. 'Fermara' fungicide and 'Tersan' fungicide respectively, for control of fungous diseases of many fruit and vegetable crops, tobacco, flowers and other ornamentals. Zinc dithiocarbamate, Zn(S)(C(S)NH)(CH2)NH(S)C(S)H, marketed as 'Puncture' fungicide, has specific action in the control of late blight of potatoes. What are the opportunities for research men?

More qualified for fundamental or applied research are offered unusual opportunities in facilities and funds. Investigations in the fields of organic, inorganic and physical chemistry, geology, geology, physics, and interested. A fellowship is available for qualified men who have completed their course of study at a college or university.

More facts about Du Pont—Listen to "Cavalcade of America," Mondays, 8 P.M., EST on NBC.