

the chemical fuels used in German rockets, hydrazine was already an old and familiar chemical material to Olin Industries. In 1912, Mr. John M. Olin, president of Olin Industries, became one of the pioneer American researchers in hydrazine during his studies in Cornell University. Mr. Olin worked on azide derivatives of hydrazine which had considerable application during the last war. Our company has been engaged since 1953 in the research and use of the azides in sporting ammunition priming materials which are among the most sensitive of explosives.

Today, what was once a laboratory curiosity has now become one of the most promising chemicals of the future. For example, in the drug field, hydrazine derivatives have shown promise in the treatment of such varied diseases as tuberculosis, high blood pressure and urinary tract infections. It is already being utilized on a limited scale in the preparation of hormones, antihistamines, antibiotics and some vitamins and sulfa drugs.

In agriculture, hydrazine derivatives have shown amazing qualities. For example, as a means of controlling grass growth and retarding weeds a substance known as maleic-hydrazine has been startlingly successful. It has been tested for several years on the grass plots along New York and Connecticut highways, actually reducing the number of mowings from nineteen to two per season.

Applied in solution, a spray is being used on onions, potatoes and carrots to stop sprouting in the winter. These are in *early* test stages only. Other derivatives are being used successfully as insecticides and fungicides, and one substance has been discovered that will kill mites without poisoning birds that feed on them.

Hydrazine's strong reducing action is what accounts for its principal industrial uses at this time. It is used to plate thin coatings of metals on glass and plastics, to separate rare metals from their oxides and salts and to eliminate final traces of dissolved oxygen from boiler water which would cause corrosion problems. In the form of hydrazine hydrobromide, it is used as a soldering flux for copper and brass. Another important use is as a blowing agent in the manufacture of blown rubber.

There is already considerable evidence that the new chemical has great potentialities as starting materials for new nitrogen dyes, synthetic detergents, wrinkle resisting coatings for textiles and as modifiers of synthetic fibers and plastics, particularly those of the type of nylon and Dacron. Some evidence indicates that the hydrazine-treated fibers may have greater strength and elasticity.

Like Mathieson, Olin Industries contributes to the new venture a substantial number of patents and patent applications developed in its laboratories and pilot plants.

Matholin has acquired the first commercial-scale hydrazine plant recently completed by Mathieson at Lake Charles, Louisiana.

John M. Olin, president of Olin Industries, is also president of Matholin Corporation. Thomas S. Nichols, president of Mathieson, is one of the directors of the company. Donald W. Ryker, until recently Manager of hydrazine research with Olin Industries, is assistant general manager of Matholin. The Company's headquarters are in Baltimore.

The Mathieson Chemical Corporation, Olin Industries' equal partner in Matholin Corporation, is engaged in the manufacture and sale of a widely varied line of industrial chemicals, agricultural chemicals, drugs, pharmaceuticals and cosmetics. Mathieson substantially extended its operations in October, 1952 through the acquisition of E. R. Squibb & Sons, one of the country's oldest and best known ethical drug houses.

Coincidentally, Olin and Mathieson had their beginnings in the same year, 1892. The first Olin enterprise was a black powder plant at East Alton, Illinois. Mathieson's was an alkali works at Saltville, Virginia.

Research which finally resulted in hydrazine becoming a useful "new" product was initiated and sponsored by Olin's General Research Organization about seven years ago. Dr. Fred Olsen, Vice-President for Research and Development, and Dr. R. L. Womer, manager of New Products Research, organized the first hydrazine studies at the Olin Company. Evidence of the kind of teamwork it takes to put a project of this sort across, is the important contributions made by the New Products, Engineering, Physical Chemistry and Commercial Evaluation departments of the General Research Organization, as well as by the research departments of the Explosive Division, the Ammunition Division, and the Film Division, and by a number of outside consultants and research organizations hired by Olin.

Dr. Oscar J. Swenson, manager of the Engineering Development Department, has made significant contributions to the development of the young industry, both while he was a consultant of our company and after he joined its General Research Organization. He designed, for Olin at East Alton, the first pilot plant in the United States for the dehydration of hydrazine and thus laid the groundwork for handling an extremely dangerous, explosive material in a "push-button" plant. Dr. Basil deB. Darwent has taken an active part in the program, and Donald W. Ryker has been the key figure in managing Olin's hydrazine activities. Dr. R. D. Twelves of the Explosives Division Research Department, Andrew Zeller, and others have played important roles in various phases of the program.