

Increasing the size of the vertical tail surfaces of the new four-motored transport planes would be the most effective way to increase control of the plane needed if one of the four motors failed, Mr. Johnson said.

Some automatic control over the power of the engines, if one of them dies, is needed, the research engineer indicated, for "the pilot should not be expected to juggle throttles, trimming controls, landing gears, flaps and airspeeds during the critical 10 seconds after take-off."

Mr. Johnson described the characteristics of the four-motored plane of the near future which would give it increased safety at take-off. The projected plane could land and take off in smaller landing fields than is now possible.

One striking finding of Mr. Johnson's analysis of take-off safety is that when one of the four motors fails it is best that the power in the corresponding motor on the other side of the plane be reduced to 50% of its rated take-off value. The idea that if one motor failed the other three would need to deliver still greater power is refuted by Mr. Johnson's study.

Science News Letter, January 20, 1940

Improved Spark Plug

A NEW and superior type of spark plug for high-powered airplane engines has been developed in England, it was disclosed by A. L. Beall, Wright Aeronautical Corporation.

The new type plug uses ceramic materials for its electrical insulation instead of thin sheets of mica compressed and piled one atop the other. Ceramic spark plugs are not themselves new, but the new British type are outstanding because they can be used under the severe conditions of high-powered aviation motors.

Ceramic spark plugs are smaller and lighter than mica spark plugs, a big advantage for multi-cylindered engines.

Science News Letter, January 20, 1940

CHEMISTRY

"Father" of Nylon Receives Prized Medal of Chemists

His Research in Making Big Molecules From Small Ones Is Important Part of Rise of Organic Chemical Industry

THE chemist who initiated the research of making big molecules out of little ones that led to the discovery of nylon, remarkable organic material out of which chemistry can make anything from sheer silk-like stockings to toothbrush bristles and fishline leaders, was awarded one of science's highest honors: the Perkin Medal of the American Section of the Society of Chemical Industry.

The man is Dr. C. M. A. Stine, vice-president in charge of research, of E. I. du Pont de Nemours & Company of Wilmington, Del. In his address following the medal presentation Dr. Stine traced the rise of America's great organic chemical industry of today from its virtual birth at the time of the World War in 1914.

Directly or indirectly from the results of intensive research in organic chemicals have come the following advances: Modern plastics, motion picture film using synthetic camphor, medicinal chemicals like sulfanilamide and sulfapyridine, superior dyes, improved cheap and safe refrigerant fluids like Freon, a vast improvement in the wear of automobile tires, the development of synthetic rubber, safety glass, tougher and more oily oils and lubricants for motor cars, superior gasolines and fuels, better and safer explosives, synthetic urea for fertilizer for agriculture, and the new plant hormones and vitamins.

Contrary to popular belief, American chemical industry was large prior to the World War, but mainly in the inorganic

chemical field, Dr. Stine said. As early as 1865 its products had a valuation of some \$60,000,000. In 1910 the United States produced three times as much sulfuric acid as Germany and twice the amount of alkalies made in England.

In organic chemicals, however, the United States was sadly lacking at the start of the war. The great industry which has been created since that time, in this field, represents an enormous investment of American money and American brains in research, Dr. Stine continued. He revealed that in the case of the du Pont concern alone, \$40,000,000 was invested in research before a cent of profit was realized.

Dr. Stine challenged those who maintain that present national and international ills are the result of too much scientific development.

These people overlook, he said, "the horrible wars that have been waged all down the years when there was no science as we know it today. They overlook or wilfully ignore the well recognized fact that the lust for power by one man, or a small group of men, leads all too frequently to that great social and economic disaster called war. Until indoctrinated race antipathies and hatreds, envy, and greed for power are eliminated from human nature through spiritual regeneration, we shall have no solution of this fatal disease which afflicts humanity. Science, though it is able to confer the richest blessings upon mankind, is not able to change the heart of man and insure that the great increases in scientific knowledge will be beneficially applied. But while this is unquestionably true, I nevertheless hold that the great contribution which the development of the organic chemical industry has made to the self-sufficiency of this country is a definite contribution toward the maintenance of peace."

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A "howling machine" developed by the Forest Service howls when the exploring coil of the detecting device comes near metal embedded in logs.

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