CHEMISTRY

# New Fiber Rivals Nylon

**Synthetically produced "orlon" is credited with great strength, superior resistance to wear, heat and chemical action. Quantity production has not yet begun.**

➤ A NEW synthetic fiber that will rival and surpass nylon in many uses is about to go into production. It is named by one company "orlon" and it is made from acrylonitrile, one of the ingredients of the synthetic rubber known as Buna N.

DuPont, also producer of nylon, is understood to have a plant being designed for production of orlon, which is the mysterious Fiber A that has been rumored for some time. Other chemical manufacturers, especially American Cyanamid and Rohm & Haas, produce acrylonitrile and may be expected to offer the new plastic.

The new fiber is said to possess great strength and to have superior resistance to wear, heat and chemical action.

Stockings, underthings and other clothing will not be made from it, because nylon is superior for such uses, but orlon will be used for curtains in homes, hotels and elsewhere and for industrial uses for which nylon has some shortcomings. One disadvantage in the new fiber is that it cannot be dyed as effectively as nylon. Orlon will also have use as sheets and in other solid forms.

Samples of orlon are known to have been distributed quietly for testing and evaluation by manufacturers and plastics users. Quantity production has not yet begun.

The basic chemical, acrylonitrile, is made primarily from petroleum, like so many other similar chemicals. The fiber is made by polymerizing the chemical, that is, treating it so that the molecules in it have a chance to grow bigger and longer, giving it a structure useful in fiber.

Improvements in chemical processes have made the acrylonitrile cheaper to produce. Combined with the desirable qualities of the orlon fiber, this has spurred the expected production.

Some of the earliest synthetic rubbers made in America before and during the recent World War were copolymers of acrylonitrile and butadiene. These rubbers were tradenamed Hycar or Ameripol and Chemigum, while Buna N is the present usual designation. The most widely produced synthetic rubber of the government's war program is made from butadiene and styrene and called Buna S. With cheaper acrylonitrile, greater commercial interest in the Buna N rubber is expected, because in some respects the acrylonitrile rubber is better than the styrene rubber.

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ENGINEERING-AERONAUTICS

# Jet Discharge Measured

➤ CHANGES IN DENSITY in supersonic gas jets, such as rocket and engine jets, can now be measured without inserting any sort of probe into the stream and without interfering with its flow.

John Winkler of the Palmer Physical Laboratory, Princeton University, has developed an optical system which can detect changes in density of gases issuing from a jet by passing a beam of light through it. An electric arc, struck from magnesium electrodes, furnishes a monocolored light which by a system of lenses and prisms is split in half, and half the light passed through the jet under study. A delicate optical comparison between the two halves of the light beam then shows how much the one has been slowed down by passage through the gases.

The sensitive system can trace flow lines of the streams of gas from the jet and then by suitable calculations scientists can arrive at values of pressure and temperature which are valuable in the study of jets. Heretofore, wires and tubes had to be stuck into the jet for such measurements and these interfered with the free flow of gas. This type of investigation is especially valuable for transonic and supersonic velocities where effects of compressibility become noticeable.

Shadow photography, which has long been used in studying the flight of bullets, aids in the study of jets by recording information to supplement Mr. Winkler's optical method. The shadow photographs show the geometrical shape of the shock fronts and slipstreams.

The new method is based on an older device developed by Mach in 1892 with which he measured the amount of bending of a beam of light as it passed through a denser substance.

Mr. Winkler reported that during his investigations he discovered that in 1930 the Zeiss optical works of Germany had built a large type of one of the earlier models of the instruments for Russia.

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***FOR MORE DURABLE LUGGAGE —A luggage smashing machine is shown in operation to determine the resistance to strain of the baggage. Tests closely duplicate stress encountered in travel.***

GENERAL SCIENCE

## "Baggage Buster" May Improve Suitcase Quality

➤ SMASHING LUGGAGE using a "baggage buster" which drops a 150-pound weight on a suitcase is one of a new series of tests at the National Bureau of Standards which may lead to more durable luggage for you in the future.

It's all part of a test to determine the durability of hand luggage. The Bureau wrecks all kinds of baggage to find out which ones take punishment best—the kind of punishment that your suitcases face each time you take a trip. Luggage is dropped from heights, picked up and set down by machine, punctured by special tools, all to determine its resistance to strain.

To check the results of the mechanical test, a set of bags was loaded and sent on a 12,000-mile trip around the country. Results of this trip and the mechanical test were almost the same, indicating that the Bureau's methods give a good test for stress encountered in actual travel.

Through heaps of destroyed luggage, the Bureau's scientists have emerged with a tentative standard for the strength of suitcases which may result in the development of new and stronger types of baggage. A piece of luggage, the Bureau says, should be able to withstand a weight of 150 pounds, dropped on any side. It should be able to take 25,000 pick-up motions of the machine and withstand rough dropping from various heights.

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