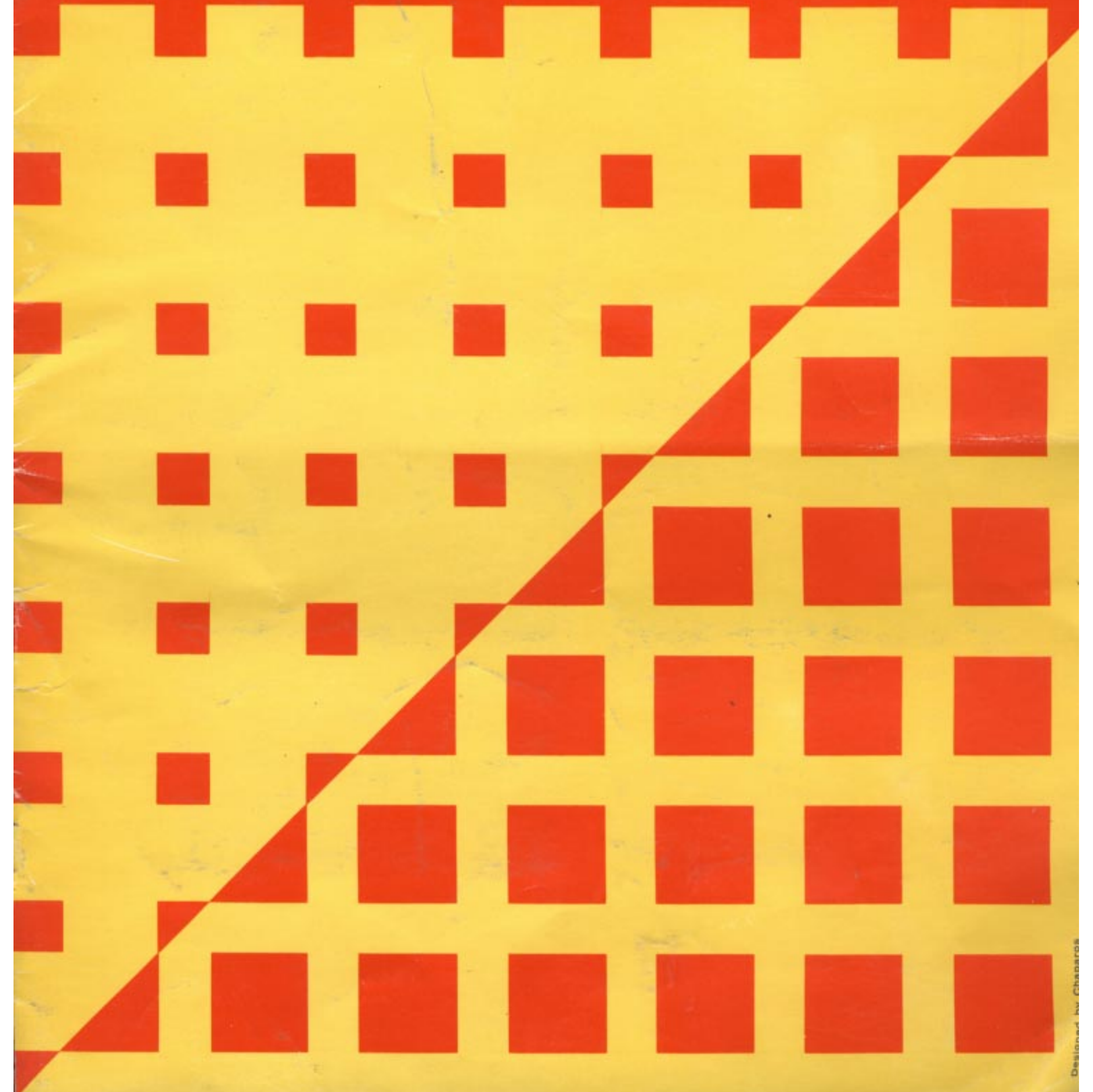
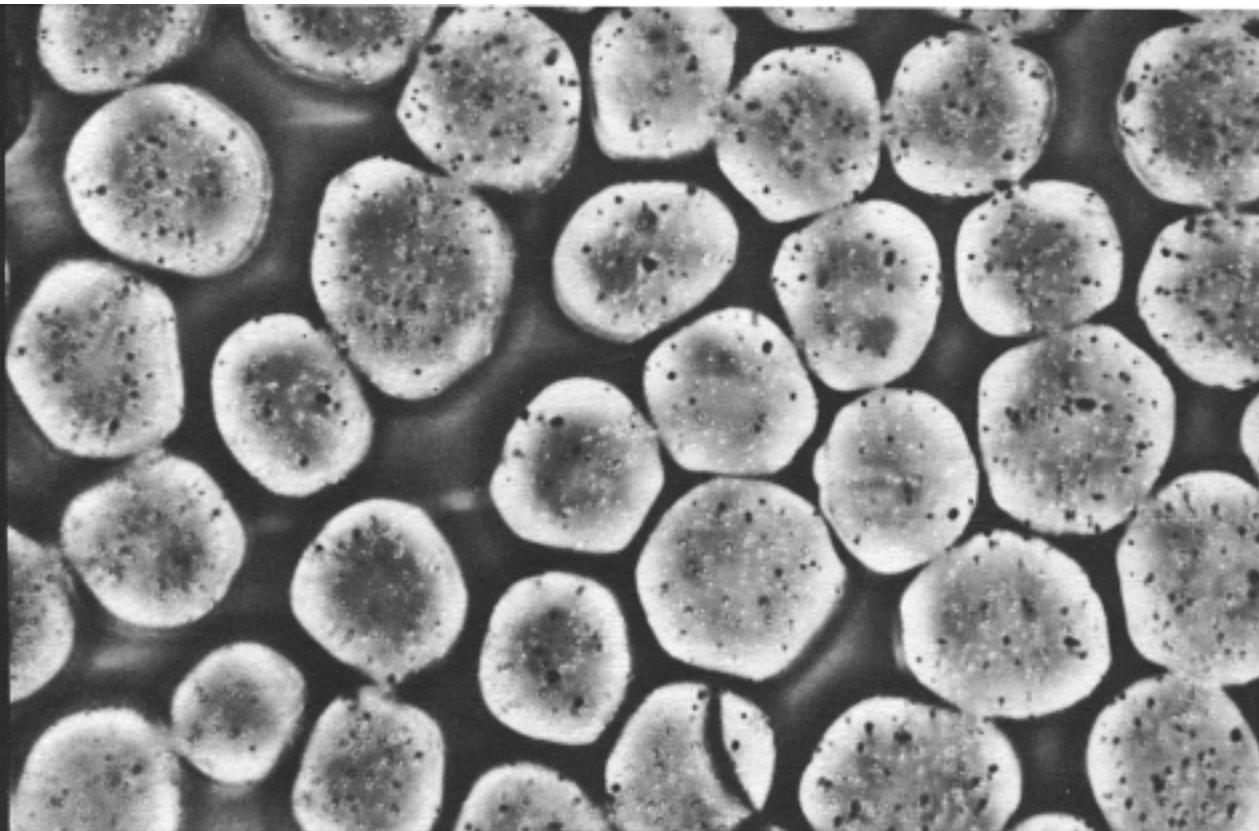


AMERICAN FABRICS

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“if you can't do it *better*
... why do it at all?”

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m4
G3

This cardinal philosophy took Dow Chemical through
nine years of painstaking research . . . but culmi-

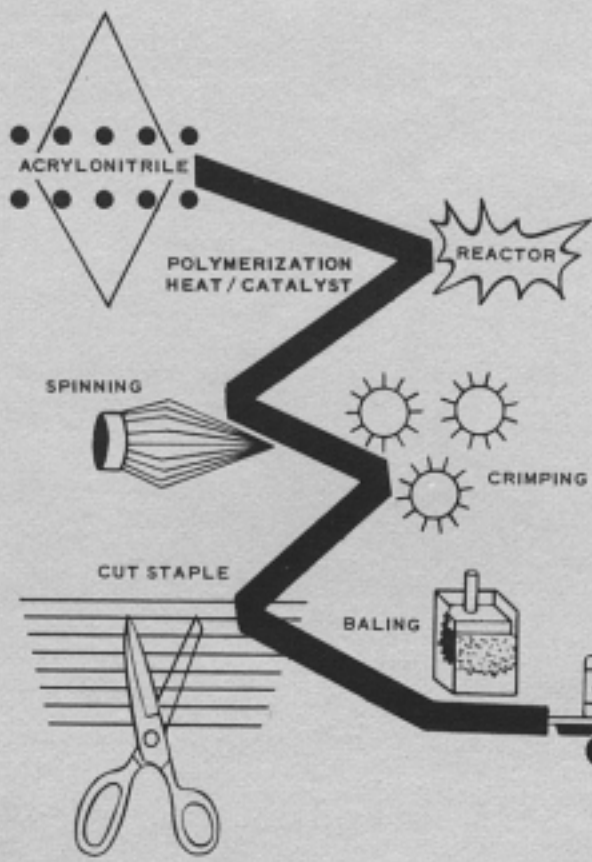
nated in **Zefran** . . . a fiber

with precious new properties



american fabrics magazine presents
the story of zefran

. . . new acrylic alloy fiber by Dow

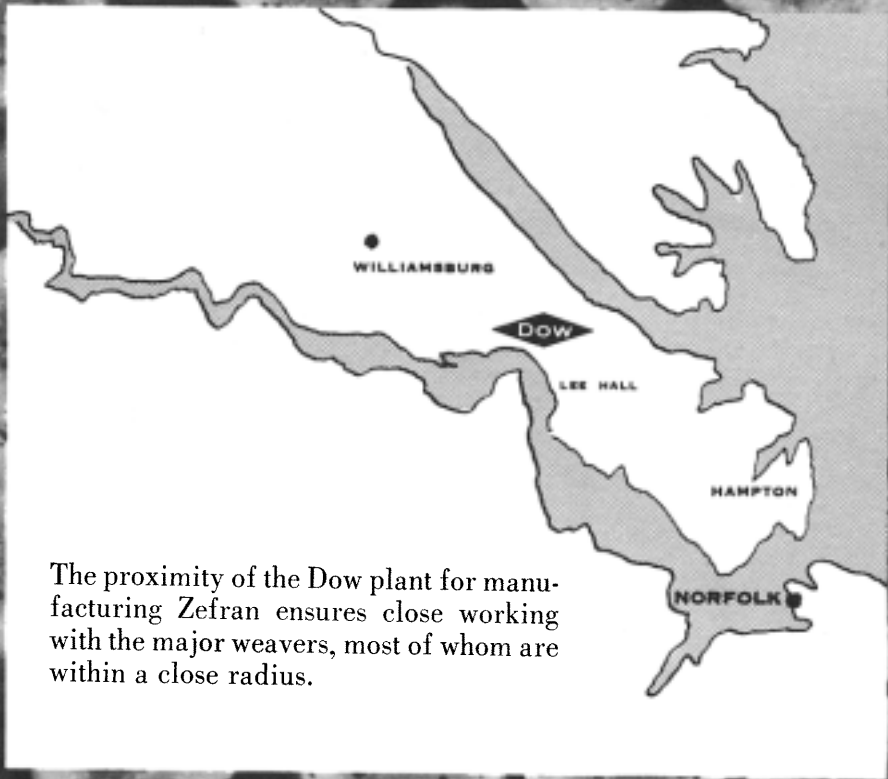
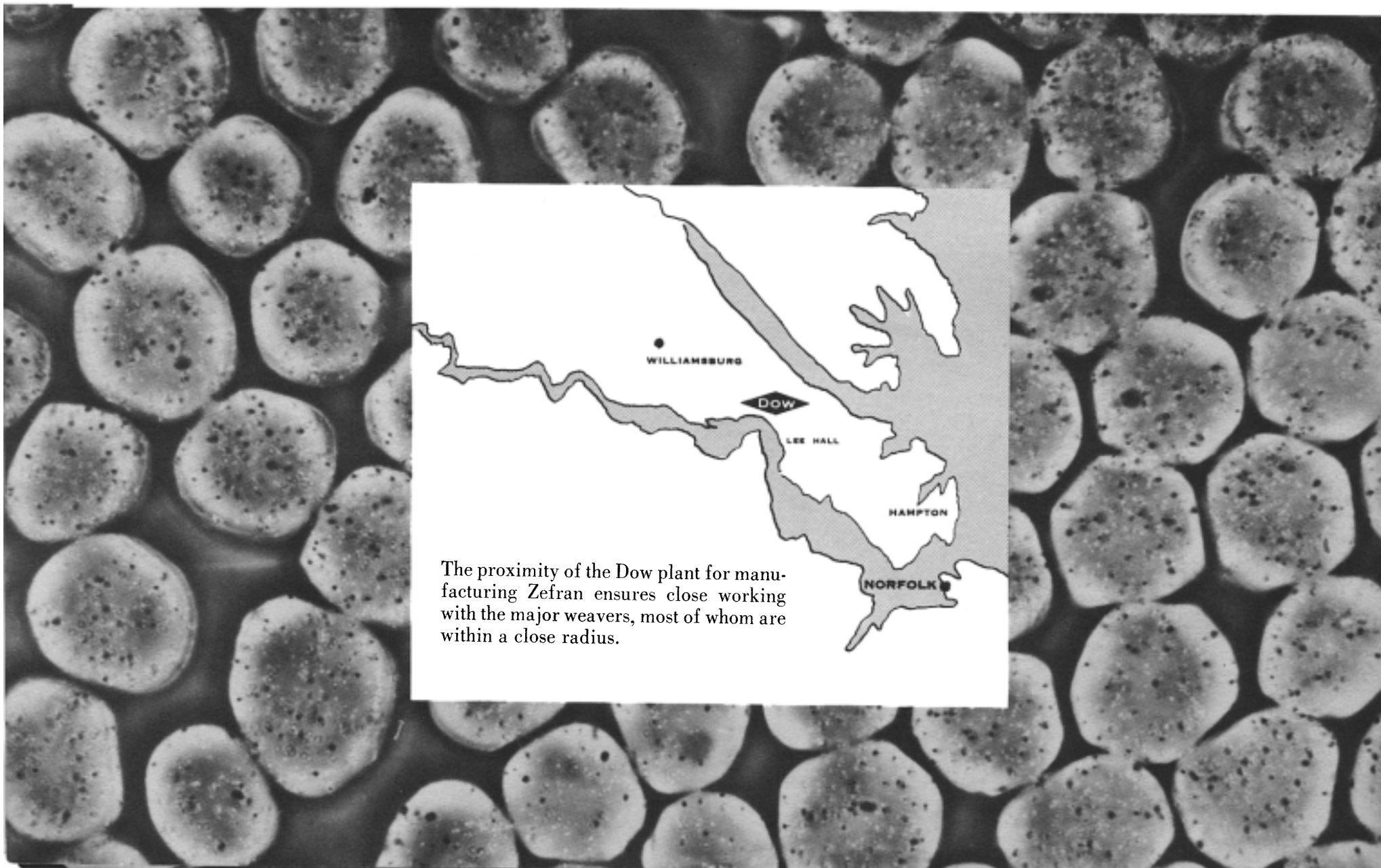


During the process of Zefran fiber production (see schematic chart at left) added chemicals provide dye-affinity and other characteristics



IN A DAY WHEN new chemical fibers are being produced with great frequency, accepted with great alacrity and sometimes expiring almost at birth, the development of Zefran by the Dow Chemical Co. points up the worth of pre-planning toward a ready market to ensure success

Magnified micro-photograph of Zefran fiber cross-section.



The proximity of the Dow plant for manufacturing Zefran ensures close working with the major weavers, most of whom are within a close radius.



**“if you can’t
do it *better*
... why do it at all?”**

All fields of industry consist of two distinct types of producers: (1) the Me-Too group who rush to imitate the originators and (2) the Me-Better individuals who recognize that a surer way to success lies in *doing it better*. It is in the latter category that Dow’s new Zefran fiber comes; more than that, it has always been a ruling factor in the determination of *any* new venture that if the company could not make something better than existing competition Dow would not make it at all.

Dow started in 1897 at Midland, Michigan. Herbert H. Dow was a young chemist who had devised new processes for extracting bromine and chlorine from natural brines; it was not long afterward that his company added calcium and magnesium compounds from the same source, and to this very day brine chemistry is a major part of the entire Dow operation. From here to a fiber development like Zefran might appear to be quite a jump; actually the latter is the result of a gentle transition achieved through research. Dow annually invests 3% of its total sales in research, always keeping in mind Herbert Dow’s precept: *If we can’t do it better, why do it at all?*

From Organic Chemistry to the Aesthetic

During World War I, Dow entered the field of organic chemistry; the company was responsible for the first American production of synthetic indigo dye, and synthetic phenol which

is one of the work horses in chemistry and the starting point of a widely used plastic; during the same period Dow undertook the production of metallic magnesium, and ultimately the name of Dow became synonymous with magnesium.

By World War II, the company was ready with the only commercial production of styrene; this is one of the two major components of synthetic rubber, and it is also the base from which polystyrene plastic is made; four huge plants which Dow built and operated to produce magnesium and styrene worked exclusively for the Government. When the founder of the company died, his son Dr. Willard H. Dow was made president and guided the company for 20 years; upon his death in a plane crash in 1949, he was succeeded by Dr. Leland I. Doan who was then director of sales. The company has grown considerably; it is today the fourth largest producer of chemicals in this country . . . but the one basic philosophy has remained constant: *either do it better, or don’t do it at all.*

Today Dow produces several hundred different chemical products; each has led to another in close and logical affinity. To list the succession of plastics developments by the company is unnecessary; the main point is that it was merely a matter of time before Dow would get into fibers . . . and specifically into the production of a fiber like Zefran. But here again,

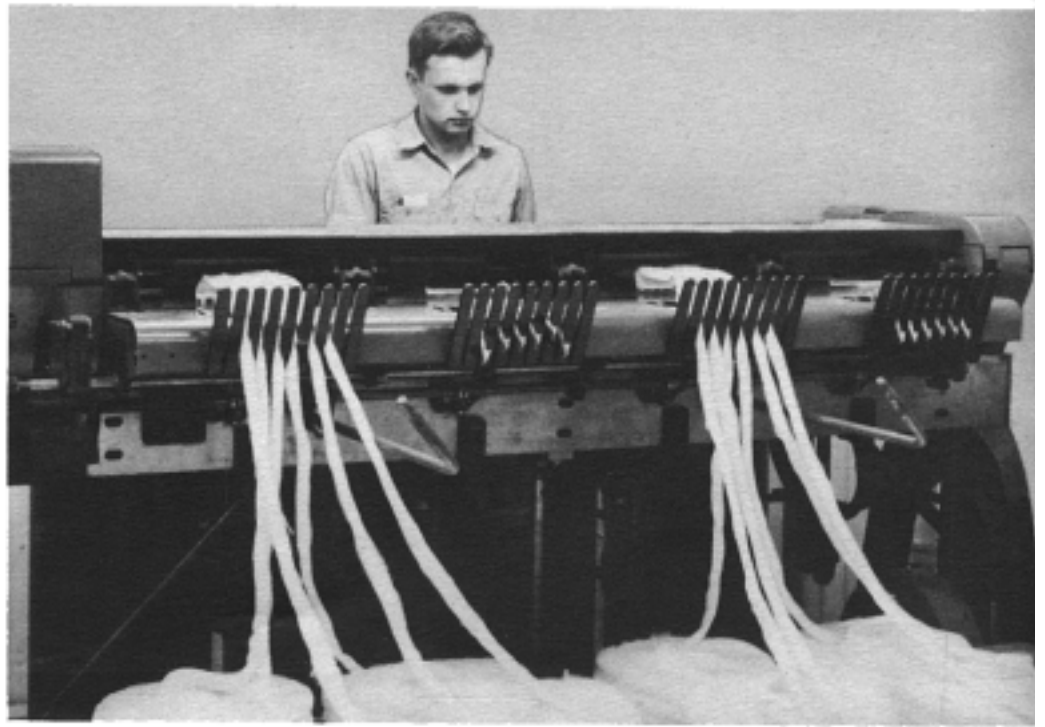
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“If you can’t do it *better*” (continued)

(left) an aerial view of the new plant built to manufacture Zefran at James River, near Williamsburg, Virginia. (right) Slivers of Zefran are set into a drawing frame before being



manufactured into yarn; this is part of the practical pre-testing done for the purpose of carefully evaluating the fiber’s processing and dyeing characteristics.



despite the fact that Dow had the facilities and a waiting market, Herbert Dow’s thinking dominated.

Manifold Objective for Zefran

The assignment given to the research and development staff was this:

1. What type of fiber has a logical and waiting market?
2. What characteristics do existing competitive fibers lack?
3. Which features should be added or substituted to make the fiber easier to finish, easier to manipulate into good fabrics and to create easy-to-needle fabrics?

The first decision, from the marketing staff, was that Dow should bring out an acrylic fiber. True, others existed: but

field research unearthed the fact that several desirable characteristics would be warmly greeted by everyone concerned, from fiber spinner to consumer. Generically, what was urgently needed was a new acrylic with built-in *aesthetic* features . . . and now the baton was handed to the laboratory technicians: the making of *an* acrylic was not the objective; rather, it must be an acrylic which would have a *better* dye affinity, one which would *resist* pilling, one which would have more of the *hand* which typifies the natural fibers.

Zefran, originally titled Q-1204, was born after *nine years* of arduous research effort. It was the result of teamwork by the chemists under Dr. G. William Stanton; it stemmed from a most careful screening of the many types of polymers to find the one best suited to modern needs. In the course of this research many fiber possibilities were hit upon, some of them already in existence and some in improved versions. But it



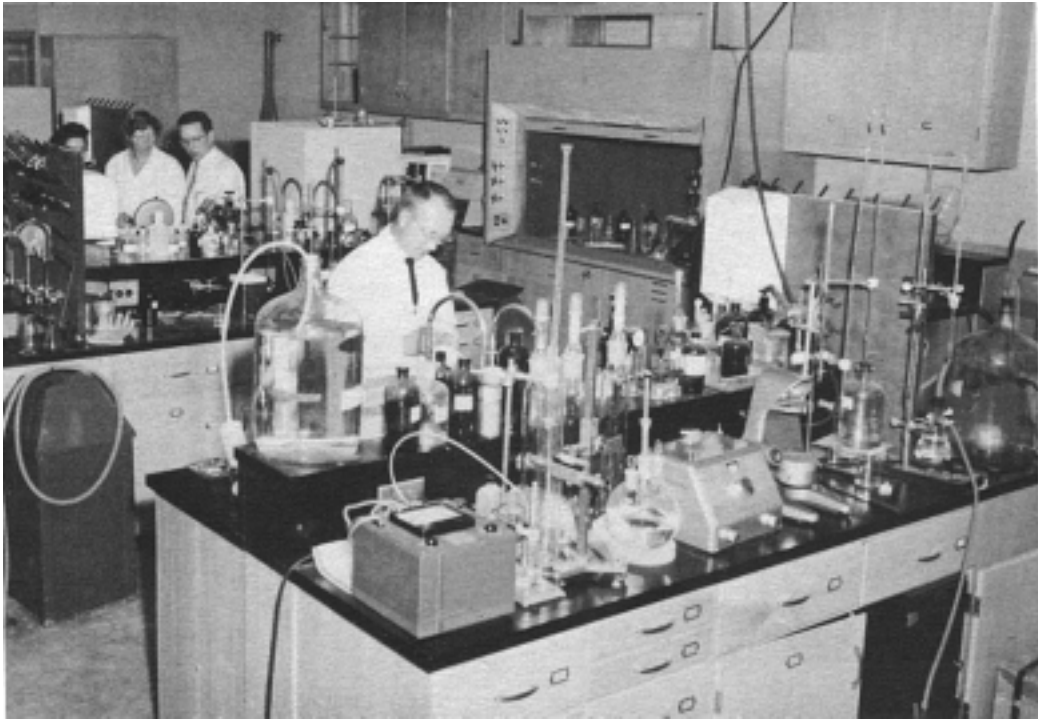
High-loft blend of 50% Zefran with 50% angora wool, by A. D. ELLIS



WORUMBO's ZEFLEUR blends 55% Zefran with 45% fine grade wool

(left) Some of the activities in the production control laboratory at Williamsburg. (right) Dr. G. W. Stanton, director of research in the Textile Fibers Department at Dow stands by a spinning frame and carefully checks the efficiency with which

Dow yarns can be spun on standard equipment; thus, improved methods are learned at first hand by Dow technicians, to the benefit of its customers.



was not until the very end that the chemists finally developed the formula for the one acrylic which not only matched existing fibers in structural and functional form, but was endowed with *all* of the aesthetic features which Dow sought.

The virtues of acrylics were already known to textile chemists before Dow started on its own study . . . but so were the disadvantages. Here, again, the thinking of Herbert H. Dow was put to work: *do it better, or don't do it at all*. First came field research among consumers, weavers, finishers, cutters and retailers. Good as acrylics were, what would it take to make them better? When the great mass of data was correlated and analyzed, the factors which had to be included.

1. A new acrylic would have to take dyes better than existing fibers.
2. It must be economical to produce, easy to manipulate.

3. It must be widely adaptable, to meet the varying needs for a great diversification of finished products.
4. It must be adapted to blending with other fibers.
5. It must have a more natural hand, or feel.
6. It must contribute better draping and needling qualities, to reduce sewing costs.
7. It must reduce the tendency toward pilling.
8. It must parallel the leaning to Wash and Wear fibers.

These were the goals which were put before Dow's chemical technologists in the plant at Pittsburg, California and Dr. G. William Stanton, chief of this group. Work started on this project in 1949; for the Fall season of 1958, Zefran makes its bow as the *fait accompli*.

(please turn)



Another blend by A. D. ELLIS combines 55% Zefran with 45% wool

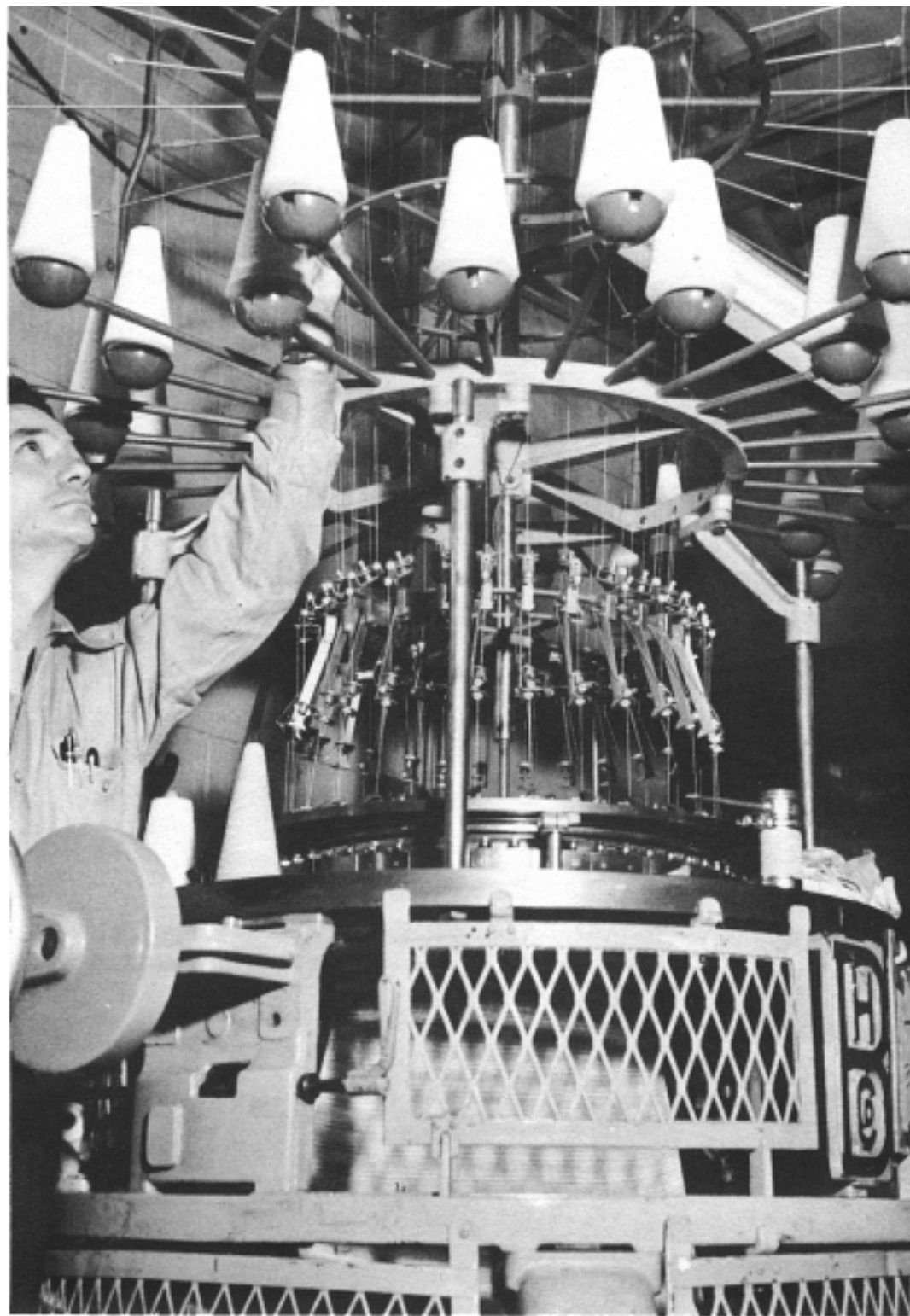


BRITTON FABRIC knits this fabric with 60% Zefran and 40% pure wool



A. S. Messer, head of the research dyeing operation supervises stock dyeing of Zefran fiber

Cutting Zefran into staple fiber is one of the functions performed in the Williamsburg plant



Development work in support of Dow customers using Zefran is done on conventional machinery

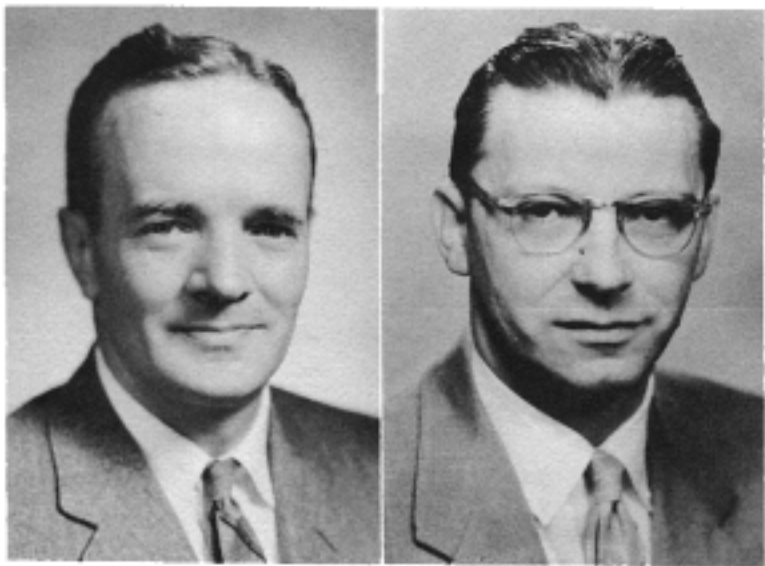
A laboratory technician tests the wrinkle-recovery of sample swatches to evaluate performance





Zefran Goes Through Actual Experience

One of the most significant portions of Dow research on Zefran is in the pilot plant built at Pittsburg. In this building Zefran, from its inception, has been subjected to every type of actual manipulation through which it must pass in secondary hands. This includes every step of processing from spinning through cutting and sewing; it puts Zefran up against the problems anticipated when it has to be dyed, woven, finished, cut and then needled and pressed; if any troubles show up in the pilot plant, the way to overcome them is developed before Dow's customers and their customers go into production. Thus, there is almost a prior guarantee of satisfaction attached to the fiber.



(left) Mr. A. E. Young is general manager of the Textile Fibers Department for Dow (right) sales-manager A. L. Ruddock charts the course of sales for Zefran in the Textile Fibers Department.

Technically Zefran, like other acrylic fibers, is based on the raw material *acrylonitrile*, which is a derivative of natural gas; the big difference is that somewhere along the line of production, a dye-receptive component has been incorporated into the fiber. Because of this, Zefran is given a greater flexibility in the choice of dyestuffs that can be used to color it, than *any* other fiber whether natural or synthetic, without sacrificing any of the inherent physical properties of the fiber. Exceptional dyeability *on standard equipment*, outstanding resistance to pilling, good dimensional stability, a pleasant

hand and durability have already been scientifically (and through practical testing) *proved* to be Zefran's strong points in either woven or knitted fabrics.

Still Being Improved

No one at Dow calls Zefran a miracle fiber. They hasten to point out that despite its many advantages, Zefran still faces certain chemical problems which are being worked on: a sensitivity to highly alkaline solutions in bleaching (for which Dow already has a corrective recommendation); Zefran does not now spin into the high bulk yarns currently popular in some sweater applications; dyeing Zefran in special shades presents peculiar problems which Dow's technical service group can help to solve.

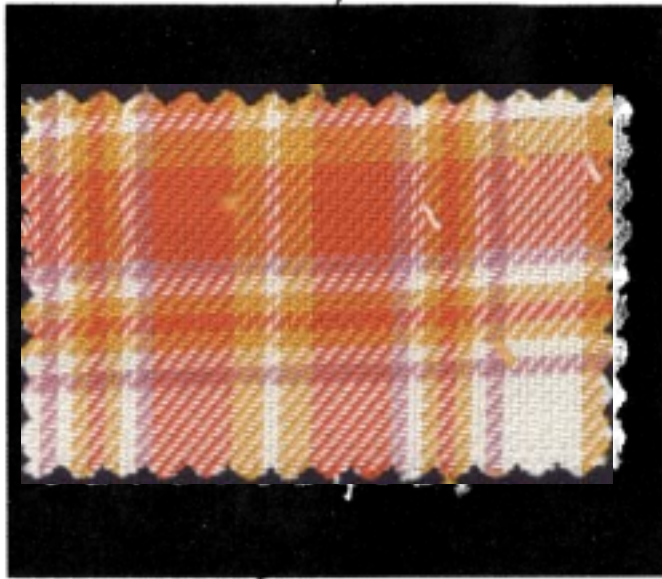
But the facts already proved indicate that Zefran is not only a new acrylic but in many ways what Herbert H. Dow asked for: *a better one*. With a better fiber came the problem: *How to merchandise it best?* It was decided that rather than throw Zefran onto the open market, a sounder plan would be to place it carefully with a selected group of fabric producers; they in turn would not only develop specialty fabrics but channel the distribution to manufacturers noted for their openness to new ideas. In short, the introduction of Zefran for Fall 1958 was to be in the form of *limited editions* . . . and this is precisely what is now available. Those millmen who have been working with the fiber report that it offers ease of processing on conventional equipment, and that it presents an unusual ability to take fast dyes without the use of pressure, carriers or other extreme conditions. Manufacturers state that the various types of cloths woven and knitted with yarn made from Zefran offer no problems in factory handling; and the retailers who have committed their stores to Fall purchases anticipate good acceptance by the consumer.

But Dow is not shutting off its research and development work at this point. The same technical services which were offered in the very beginning are still available to every business company which works with yarn made from Zefran, or is seeking to develop new products; and always there is the Dow service which offers to put the yarn through a test run under the actual future handling conditions which it must meet, to iron out bugs *before* the spinner, weaver, knitter, finisher or manufacturer gets involved.

First Fabrics Now Available

Among the fabrics available this Fall are wool and specialty fibers blended with Zefran for women's, men's and children's apparel; blends with rayon in dressweight goods; and 100% Zefran sweaters are also ready . . . a total of over 100 new fabrics being in the development or finished stage right now. Union-dyed blends of Zefran have created a great deal of interest among mills; pad-steam dyeing in the larger cotton mills, in the regular cotton technology, has produced excellent results for Fall; printed cloths combining Zefran with cotton will be vat-dyed for Spring and Summer fabrics, based on satisfactory tests already made. And for both men's and women's suits, a 6- to 6½-ounce tropical worsted blend with Zefran promises to be a successful venture.

†The new fiber will be aggressively promoted by Dow, by the fabric makers and by the manufacturers who are showing Zefran. The simple statement of *facts* about Zefran should see this new fiber in millions of consumer homes within a short period of time ●



CRESTWOOD combines 80% Zefran with 20% fine cotton for this fabric



the story of zefran



