RECENT DEVELOPMENTS IN TEXTILES

Editor's Note: Miss Dorothy Lindsley editor of article published below is Associate Director of Macdonald Institute, O.A.C., Guelph, and at our request has written the article especially for publication in Home and Country.

Today the world is faced with a serious shortage of textiles; quantity is limited, quality is slow to improve and prices are moving ever upward. The poor consumer wonders where it is all going to end.

Two wars have taught us the folly of depending on the natural fibres to supply our main textile needs. Common sense tells us that it is a physical impossibility to increase the production of the natural fibres to keep up with the steadily increasing demand for fabrics. What then is the answer?

A clue to the answer was given almost three hundred years ago by an English chemist named Robert Hooke. In 1664 Hooke predicted that one day Man would produce a fibre of his own making which would equal silk in strength, lustre and elasticity and perhaps even surpass it. Two hundred and twenty years elapsed between the time of Hooke's prediction and the appearance of the first such fibre to be produced on a manufacturing scale considered to be commercially successful.

The acclaim received by Count de Chardonnet's fibre (later known as rayon) encouraged other young scientists and soon new and improved methods for its manufacture made their appearance.

Count de Chardonnet has been called the Father of the Rayon Industry. We might, however, go farther and call him the Father of the Synthetic Fibre Industry, for his success pointed the way for intensified research in this field which has resulted in the development of several new fibres of great commercial importance.

The solution to the problem of the current textile shortage appears then to lie with the "new fibres". Are they equal to the enormous task which confronts them? Time and performance alone can answer that question with certainty, however some predictions can be made in advance. But first of all we should be sure of just what we mean when we speak of the "new fibres".

Rayon is the oldest and still the most important of the new fibres. Research has so changed and improved it that today it is hardly recognizable as being the same material that was first introduced to a skeptical and unresponsive public about thirty-five years ago.

The growth of the rayon industry has been marked by a steady improvement in quality and a decrease in price. As a result it today ranks second only to cotton in importance. Research is still in progress to produce even better, more versatile, more adaptable rayons at lower prices. The high strength rayon, so valuable during the war, is only one of the many improvements produced in this textile during the time it has been on the market.

The casein fibre was the first of the manufactured protein fibres to be produced commercially. This fibre is not made in Canada but is imported in small quantities and sold under its trade name "Aralac". Unlike the other synthetics which have been developed in recent years, these fibres do not have any marked advantages over the natural fibres unless it be in price.

Protein obtained from skim milk is the raw material and the fibres manufactured from it are similar to wool in all respects, although they are somewhat inferior as regards strength elasticity and crease-resistance. These three weaknesses have resulted in Aralac being used almost entirely in blends. It has been successfully mixed with wool, cotton, rayon and nylon and can be made to impart wool-like characteristics to the blended fabric.

Other manufactured fibres from a protein base have been successfully produced but as yet have not achieved commercial importance. This group includes fibres from the protein of soybeans, peanuts, corn, fish, and chicken feathers. All of these materials are plentiful and inexpensive but the cost of converting them into fibres is in most cases sufficiently high to make the venture unattractive.

The main source of the raw materials from which the truly synthetic fibres are produced, consists of chemical substances which are available in quantities limited only by the ability of Man to produce them. This means, of course, that once production difficulties are solved, they should be in plentiful supply.

The "glamour girl" of the truly synthetic fibre family is nylon and, while the full fashioned hosiery field will probably continue to provide its most important market for many years, other new and interesting uses for nylon await further investigation. Uncrushable nylon pile fabrics, for both clothing and upholstery; window curtains permanently set to a standard size to which they automatically return after laundering; slip covers which need only be wiped with a dampened cloth to clean; dresses with permanent pleats; scuff-proof fabrics for shoes, handbags and luggage, will all contribute to pleasanter living.

When nylon is blended, in small quantities, with some of the natural fibres it increases the wearing quality of the material. For example, tests have shown that ten to twenty percent of nylon in overcoat fabric will add more than this amount to the life of the garment.

There are literally thousands of types of nylons possible, since there are dozens of related chemicals that can be used to make this material. Each of these nylons will possess different properties and many will be suitable for entirely different purposes. The future of nylon therefore appears to be exceptionally bright. Manufacturing costs will gradually be reduced but it is unlikely that it will ever be as cheap as rayon for the basic materials necessary for its production are more expensive.

Early in 1940 another new synthetic fibre made its appearance on the retail market and was quickly drafted into the Services of the United Nations. This was the fibre which is sold under such trade names as Saran and Velon. This fibre is characterized by fire resistance, unusual toughness and wear resistance, and an almost complete inactivity to chemicals. During the war it was used for insect screens and its peacetime uses may see it continuing in this role. It has many advantages over metal screening in that it does not deteriorate upon exposure to the elements, it is easily cleaned and it can readily be produced in a wide variety of colours to match either the outside trim of the house or the interior scheme of decoration. It can also be used to make exceptionally attractive and long wearing upholstery fabrics that can be easily cleaned with soap and water.

An entirely different type of fibre made from glass played an important role during wartime and is rapidly proving itself as a peacetime textile. Made in Oshawa, Ontario, glass fibre is completely fireproof, it has unusually high strength and chemical inertness and is immune to attack by mildew, moths and other forms of deterioration.

Present day glass fabrics unfortunately possess some undesirable properties which limit their usefulness. They are not very resilient and they lack the ability to stretch. In addition they are more brittle and less flexible than other textile fibres. They are not very soft to the touch and they soon show weakening at points of flexing. For all of these reasons they are not suitable for wearing apparel.

Fibreglas fabrics are, however, exceedingly useful as household textiles. Pillows and mattresses with Fibreglas filling and covering will have an almost indefinite life as far as matting and sagging are concerned. In addition they are absolutely fireproof, are easily cleaned and will not absorb moisture or odours. These same properties make Fibreglas a popular fabric for lampshades, draperies, shower curtains and ironing board covers.

Shopping bags of Fibreglas will keep a brick of ice cream solidly frozen for four hours. Garment bags of Fibreglas are fireproof, dustproof and mothproof. Truly it is a remarkable material with a multitude of household uses designed to lessen the housewife's burden.

A wartime development which is designed to have many interesting applications is the use of Fibreglas fabric reinforced with plastics. Layers of Fibreglas cloth, impregnated with a suitable type of liquid plastic, are placed one on top of another until a laminate of the desired thickness is built up. This is then molded to the desired shape and cured in an oven where hardening takes place. These laminates have extremely high strength as compared with their weight. Potential uses for this material include light-weight luggage, boats and canoes, furniture, refrigerator and radio cabinets and other products where a combination of lightness in weight and high strength are required.

Combinations of glass fibre with other fibres such as cotton, rayon, etc., have interesting possibilities in decorative fabrics and considerable research is now underway on this application.

Novelty fibres created from a wide variety of miscellaneous materials include those of aluminum, stainless steel, rubber, seaweed and even sea shells.

The use of fine aluminum yarns coated with a thin layer of transparent plastic, which may or may not be coloured, opens up a whole new field of decorative fabrics. The material is not only lower in price than lamé but it does not tarnish and will withstand mild washing. It is expected to find ready acceptance for evening wear in shoes, handbags and dress fabrics, as well as in fabrics for less formal occasions.

The chemical revolution in textiles which began with the creation of the new fibres has extended over into the use of chemistry to improve the older fibres. Chemical treatment of the natural fibres to minimize their inherent defects, or even to eliminate them if possible, is an answer to the threat of the new fibres.

Such improvements have been possible through the development of a number of new resins and plastics. These impart to the natural fibres desirable qualities which they do not normally possess. Through their use cotton can be made stronger, linen can be made crush-resistant and wool can be made shrink-resistant. Fabrics can be made weatherproof, creaseproof, stainproof, flameproof, mothproof, waterproof and sun-resistant, all without changing their handle or appearance. Many of these finishes will last the lifetime of the material.

Shrink resistant yarns have been an innovation introduced to the knitting public within the past year. Soon both under and outer wear knitted or woven from shrink resistant woollen yarns will be available. The use of similarly treated woollen garments by the Services proved beyond a doubt that the life of a frequently laundered article, like socks, was prolonged by at least half as much again by this finish. Such garments should be laundered like any fine woollen article, but the usual precautions against shrinkage need not be taken, for example, socks need not be dried on stretchers.

Loose knitting and careless handling in the laundry process are two causes of stretching in shrink resistant wools. If properly constructed and carefully laundered, handknit garments from shrink resistant woollens will give long service and much satisfaction.

In attempting to predict future trends in textile fibres, it is important to keep in mind present proportionate distribution. The natural fibres account for about 90% of the total consumption fibres; rayon for about 10% and the newer synthetics for less than 10%.

Unlike the natural fibres, production of the synthetics is not influenced by climatic conditions, insect plagues or other natural phenomena. It can be reasonably expected therefore, that every country in the world will begin to produce synthetic fibres as soon as economic conditions permit. At the present time all the newer synthetics must be regarded as special-purpose rather than general-purpose fibres and none have progressed much past the experimental stage in their development.

In the light of recent research into fibre properties, it seems reasonable to predict that in the not too distant future fibres will be produced to meet the exact specifications laid down by spinner, weaver and consumer. Knowing the purpose for which the fabric will be used, and to what influences it will be subjected throughout its period of use, exact specifications will be given the chemist in the same manner as we today give similar specifications to the builders of our automobiles, refrigerators, etc.

It is, however, unlikely that the man-made fibres will drive the natural fibres from the field entirely, but that they will become increasingly important is self-evident. Useful and attractive fabrics can be made which involve a combination of natural and man-made fibres and this sharing of the field may be an indication that an equilibrium between the two will be reached.

The new finishes developed for the natural fibres will enable them to put up a stiff competitive battle against the synthetics. Some experts predict that the natural fibres will lose more and more ground to the synthetics as the latter are gradually improved and their cost of production is lowered; others believe that the natural fibres will maintain their place with the help of the chemist.

One thing is certain, Man is no longer dependent on Nature to provide his textiles for him; it is within his power to increase production and cut costs and so help himself in this world beset with shortages and rising prices.

F.W.I.O. SCHOLARSHIPS

Mrs. J. R. Futcher, F.W.I.O. President, presents scholarships to Miss Agnes E. Turnbull, Paris, and Miss Jean Thompson, Fenelon Falls, first recipients of the Women's Institute Scholarships for entrance to the degree course in Home Economics at Macdonald Institute, Guelph.
Both girls are daughters of Women's Institute members.

NOTICE TO INSTITUTES

Have you in your possession any information which you consider should be included in the Provincial Tweedsmuir History? If so, please send it to the Women's Institute Branch, Parliament Buildings, Toronto.