

RAYON--MAN-MADE SILK

By MARGARET BOOHER

Man Is Now Substituting for the Silk Worm—No Longer Do We Need to Depend on the Silk Worm for a High Quality of Silk—
Advantages of Rayon Over Real Silk

PERHAPS no textile fabric is used to a greater extent at the present time than rayon. From almost the beginning of time, down through the ages, silk, wool, cotton and linen have clothed the civilization, and decorated its inhabitants. No new fiber had been introduced until forty years ago when rayon was first admitted into the textile world. It took the first 30 years to prove that rayon should be classed as one of the five leading fibers. It is now independent and is applied in all lines of textile manufacture.

But what is this "Rayon"? It is defined as a lustrous textile fiber made by converting pure cellulose into thread formation by means of chemical and mechanical process. We call it "artificial silk," and "fiber silk," but these terms are often misleading, because it is not silk. It is a fiber, but so are silk, wool, cotton and linen. We get the term "artificial silk," because the ambition of the inventor was to find a substitute for silk, and for want of a better name it was first introduced as "artificial silk." The present term "Rayon" was selected because it is easy to say, pleasant to hear, and expressive. It suggests sun rays, and is appropriate for a material on which the sun can shine without disastrous effects.

The invention was based on the observation of silk spinning in nature. Scientists observed how the silkworm, feeding on mulberry leaves, produced the silk fiber. They tried to reproduce this process in a chemical and mechanical way. The first raw material used for the experiment was identical with the food eaten by the silkworm, namely, cellulose extracted from the mulberry leaf. Later it was found that wood pulp and cotton linters were best adapted to the manufacture of rayon on a commercial basis.

There are four different kinds of rayon according to the four different processes by which it is manufactured. These are: Nitrocellulose process, Cuprammonis process, Acetate process and Viscose process. The latter is used to the greatest extent, since 80 per cent of the present world

production of rayon is made according to this method.

For the Viscose process, bleached spruce pulp, cotton linters, or a mixture of the two are the raw materials used. The pulp is cut in rectangular sheets and soaked in a caustic soda solution which causes the fibers to swell and form a compound known as soda-cellulose. Then the sheets are shredded to fine crumbs, and placed in containers where a constant temperature is maintained in order that an aging process may take place. The next treatment is with carbon bisulphide which transforms the insoluble cellulose into a water soluble compound, "Viscose." The viscose is pumped through mechanical regulators placed on the spinning machines so that a constant amount is forced through the outlets fitted with platinum nozzles. The solution, forced through the minute holes of the nozzles, is divided into very fine streams which are passed through chemical solutions to cause immediate coagulation, and the formation of fine filaments which are collected and converted into skeins of twisted yarn.

The degree of softness can be produced during the manufacture since it is the result of the number of single filaments drawn from the cellulose solution. The rayon filaments can be spun as fine as cocoon fibers. Its dyeing qualities are very advantageous, since it takes substantive and basic colors very uniformly, giving brilliant colors to the yarn or fabric.

Rayon is soft and pliable. It owes its extensive application in all textile commodities to its uniformity, fine luster and high dyeing quality. Fabrics made of rayon must be handled carefully like any kind of delicate fabric. It loses its strength while wet, but regains its previous strength after drying. If handled carefully, it resists all the usual treatment with chemicals, and also higher temperatures. It will not turn yellow regardless of age or treatment. It has the property of absorbing a large amount of moisture. This is an advantage when used for underwear because it absorbs the perspiration from the body, and permits the evaporation of

the excess moisture, thus keeping the skin dry and comfortable.

On the other hand, when washing in water, it absorbs so much of the liquid that it increases in volume by forty percent. For this reason, when drying it is better to spread rayon garments out on a flat surface instead of hanging on a line, as the water in a hanging garment collects at the lowest point and tends to cause a stretching of the partially dry portions.

Gasoline or any well known cleaning compound will cause no injury to rayon. It will take starch as cotton. When ironing, it is wise to press the material under a slightly dampened cloth. If the iron is used directly on the goods, it is likely to give a peculiar shiny appearance such as the impress of an iron on worsted or woolen goods. No water is too hot or too cold to harm the texture of this goods. As nearly all rayon is fast dyed, there is little danger of harming the colors in washing.

The most commonly recognized form of rayon is the knitted fabric used in sweaters, scarfs, women's underwear, hosiery, etc. It has been in general use for years in many other forms not commonly known as rayon. Among these are silk and rayon brocades and tapestries. It has found its way into many of the finest dress materials. It is used in woollens for decorative stripes and patterns. In many figured voiles, mulls, and other cotton materials, it is evident in the silky stripes and patterns. Curtains, embroidery floss, fringes, laces, elastic braid, ribbons, and sewing thread are some of the articles which are made entirely from rayon.

It has some advantages over real silk. Natural silk rots from perspiration and turns yellow, while artificial silk remains white. Real silk is generally weighted to a very high percent, which makes it brittle and not conducive to good health. Artificial silk is not weighted and has no injurious effect on the skin.

Rayon can easily be identified by its chemical and physical properties, the combustion test being the simplest.

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BIOLOGY IN RELATION TO DOLLARS AND CENTS

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come and ardent cooperators the chemist. He strives and helps us in our problems as to possibilities of settling perplexing problems in formation and transformation of substances in

plants and animals. To know the chemical condition in their bodies is an advantage and more than an appreciation. And to know in terms of chemistry when to apply certain measures in case of distress, means dollars and cents, and above all a comfort to the nation and world.

My description above, you may think, centers from only my pecu-

niary standpoint. Therefore it is through such deductions that we have the right to speak of a divided science in relation to dollars and cents. Incidentally the additional dollars and cents came more to the rightfully claiming agriculturist and to humanity in general, than to the scientist whose labors made them possible. The scientist of course has the enjoyment of his work and the satisfaction of performing valuable service.

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est. It burns like cotton with an odorless flame and leaves no residue but a small amount of ash. It is distinguished from real silk in that it does not dissolve in a concentrated solution of caustic soda.

The future possibilities of rayon are in the hands of scientists, and since they have already done so much, we feel confident that rayon has proven its worth and use to all of us.

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