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ARTIFICIAL SILK.

Some time ago we gave an account of the Chardonnet process of making artificial silk, and reference has been made to other processes of making substitutes for silk, none of which have proved a commercial success. There is now a great deal of talk in England over the latest invention in that line, but whether this achievement of the chemist's art will rank alongside the marvelous fibre spun by the silk worm is yet to be demonstrated. Its success or failure, however, will soon be demonstrated, for a company has been formed at Bradford with a capital of £108,000 to exploit the new process, which is the invention of Dr. F. Lehner, of Zurich, Switzerland. Many samples of the silk have been shown in Manchester, Bradford and other places, and it is said to be as fine in appearance as any China or Italian silks. The operations of the silk worm are so interesting and mysterious, and its products so delicate and beautiful, that most people will feel skeptical as to any artificial production taking rank beside them, but should it prove a success, Canada stands a good chance of taking a prominent hand in it, for the raw material from which it is evolved is wood pulp, of which we have enough to supply all human wants while the world stands. The silk can be made from cotton or jute waste, but should it come into use on a commercial scale it will probably be found that the pulp of the mulberry tree, from which the silkworm itself digests its wonderfully glossy fibre, will prove most suitable. The new company recently invited the representatives of the local press, who describe the process and who pronounce the colorings of the silk to be excellent.

The following account is given of the process by an English paper:—The basis of the material is cellulose, which is the product resulting from "digesting," or treating by acids and alkalies, all vegetable fibres, such, for instance, as wood, flax, cotton and jute. By combining the cellulose with nitric acid a nitrate is formed, and if a small quantity of sulphuric acid be also added the latter combines with the water, and, to use a well-understood chemical phrase, "splits off." The highest nitrates of cellulose are explosives, and are insoluble in alcohol-ether. It is these nitrates which in various forms of modern explosives are familiar as cordite, tonite, etc. The pyroxylin nitrates or lower nitrates are less explosive, and are soluble in alcohol-ether. Ordinary pyroxylin dissolved in alcohol-ether (equal parts of alcohol and ether) is gelatinous in character, but wanting in viscosity. In other words, it will not, though a semi-fluid, flow freely. It is, in fact, not unlike good melted fish-glue. (Everybody knows from experience how in drawing the brush from a glue-pot, as the glue is getting cold, long strings of fibres may be produced.) A solution containing, say, more than 7 per cent. of cellulose is, however, too gelatinous to be readily workable, and in the Chardonnet artificial silk process enormous pressure is resorted to in order to force the material through orifices sufficiently fine to produce a fibre capable of being spun. It is at this point that Dr. Lehner's special treatment of the pyroxylin comes in. By the addition of dilute sulphuric acid to the alcohol-ether solution he breaks down the nitrate into bodies of different physical but of the same chemical character, and consequently is able to obtain a 12 per cent. solution that is perfectly fluid and workable.

When, by these chemical methods, the fluid is prepared, mechanical contrivances for converting it into a textile fibre come into play. The machine employed is a modification of the ordinary flyer spinning frame. The fluid—a muddy, yellowish substance—is contained in a glass jar, from which it is conveyed through pipes to a row of small bent glass tubes, each having an extremely fine nozzle or orifice. These tubes are arranged in a shallow trough of water, the orifice being beneath the water level. As the fluid leaves the nozzle the water removes 60 per cent. of the solvent, and the fluid immediately coagulates and is drawn off in a remarkably fine filament of brilliant lustre, and, when