SILK, ARTIFICIAL. Artificial silk has been the aim of experimenters for many years. The first attempts to produce it on a commercial scale were made by Joseph Wilson Swan of Bromley, England. The Comte de Chardonnet, at the Paris Exposition of 1889, exhibited a most ingenious process of producing from cellulose an artificial fibre resembling in its characteristics and uses the true silk of *Bombyx mori*. The cellulose experimented with was principally of cotton and the pulp of soft woods. In making artificial silk from cotton by the Chardonnet method the lint is first carded into wadding, which is immersed in a mixture of 15 parts of nitric acid of 1.5 specific gravity and 85 parts of commercial sulphuric acid. This process transforms the cotton into a nitrated cellulose and continues until its color, when examined with the microscope and polarized light, is a clear blue. The next stage in the process is to press the nitrated cotton, which is then washed to remove all traces of the acid. It is then dissolved in a mixture of 40 parts alcohol and 60 parts ether, forming collodion, which requires aging in order to secure the best results. This collodion is placed in steel cylinders, and the liquid is expelled by pressure through capillary tubes into nitric acid diluted one-half with water. The fibres thus produced are wound directly upon reels and are ready for subsequent treatment. This involves the drying of the fibre by warm air and its denitration in a bath of alkaline sulphide. It then goes through additional washing and drying processes, after which it may be spun and dyed like natural silk. Many other inventors, notably Lehner and Du Vivier, followed Chardonnet, modifying his method.

A second type of artificial silk is known as the cuprammonium or Glanzstoff silk. It is made by dissolving cellulose in ammoniacal copper oxide or carbonate and forcing the solution through capillary tubes into a coagulating bath. The threads are wound on bobbins, spun, washed, soaped, and dried.

The artificial silk principally produced in the United States is commercially known as viscose. It was first prepared in 1892 by Cross, Bevan, and Beadle, of London. As manufactured in the United States, cellulose in some form, usually wood pulp, is treated with caustic soda to form a sodium cellulose and then dissolved in carbon disulphide. The product, alkali-cellulose-xanthate, is a viscous solution popularly called viscose. It is filtered, allowed to ripen by standing, and finally forced through fine apertures into a setting bath which solidifies the threads.

Artificial silk is chiefly remarkable for its brilliancy. Nitro and viscose silks are more lustrous than natural silk, but have a somewhat harsher feel. Some of the early shortcomings of the artificial product—lack of strength and elasticity and a tendency to disintegrate when wet—have been considerably lessened, and these silks are now used in fabrics for both warp and filling threads, for hosiery, dress trimmings, upholsteries, and rugs. They also take the place of real silk for insulating electric-light wires and make durable mantles for incandescent lights.

The production of artificial silk is rapidly increasing. In 1912 the world's output amounted to over 8000 tons, valued at about $30,000,000. Consult: S. P. Sadtler, *Handbook of Industrial Organic Chemistry* (Philadelphia, 1912); Sir T. E. Thorpe, *Dictionary of Applied Chemistry* (rev. ed., London, 1913); J. M. Matthews, *Textile Fibres: Their Physical, Microscopical, and Chemical Properties* (3d ed., New York, 1913); and articles in *Textile American* (August to October, 1914).