Silk-man'u-fac-ture. The processes intervening between the making of the cocoon and the preparation of the silk for market.

1. The chrysalis is killed within the cocoon by the application of heat before it has developed into a moth.
2. The *floss silk* is stripped from the exterior of the cocoon.
3. The cocoons are placed in warm water, to loosen the gummy adherence of the filaments.
4. The filament ends are carried around a reel and wound into a skein.
5. The skeins are made up into hanks or bundles, forming the *raw silk* of commerce.

The length of each filament is usually about 300 yards; 250 average cocoons weigh about 1 pound; 12 pounds of cocoons yield 1 pound of silk = 3,000 cocoons to 1 pound of silk. — DODD.

6. The raw silk is wound from the hanks in which it is brought to market on to hexagonal frames, called swifts, and is thence transferred to bobbins.
7. *Clearing.* To remove irregularities from the surface, each thread is caused to pass under a steel scraper or between two rollers. This is done by the *clearing*-machine, where it is wound upon other bobbins.
8. *Spinning.* The spinning-machine is provided with a number of rapidly rotating spindles by which a twist is imparted to the filaments drawn from the bobbins taken from the clearing-machine, as they are transferred to another set of bobbins.
9. *Doubling.* Two or more of the filaments are twisted together, and at the same time wound upon bobbins by the *doubling*-machine.
10. *Throwing.* The *throwing*-machine twists and combines the threads in a manner nearly similar to that of the spinning-machine. For some purposes the two operations are combined; for others the throstle-frame is employed.
11. *Glossing.* After throwing, the silk is usually dyed, and is then transferred to the *glossing*-machine, where, by the combined action of steam and stretching, it is elongated and a glossy surface is imparted. The fibers may be stretched in length one tenth.
12. *Winding.* The various processes enumerated having been completed, the silk is again wound upon bobbins, and is ready to be woven.

The quality of silk is denoted by the number of yards to the *denier*, a weight equal to 24 grains.

Silken thread merely wound and cleaned is called *dumb singles;* when wound, cleaned, and thrown, *thrown singles;* if single-twisted, *tram;* if double-twisted, *organzine;* if the natural gum is left, *hard silk;* if removed, *soft silk.*

For silk gauze, *dumb singles* is employed.

For ribbons and common silks, *thrown singles.*

For the weft threads of the best silk, *tram.*

For the warp threads of the best goods, *organzine.*

Floss silk is the outer portion of the cocoon; it is worked up into yarn for cheap handkerchiefs, shawls, and other coarse fabrics, by processes somewhat resembling cotton spinning.

After sorting, the filaments are disentangled by a hackling process, being held firmly at one end while the other is drawn over a set of *gills.*

At the *filling-engine*, the silk, while passing between feeding-rollers, is subjected to the action of a series of moving combs.

The *drawing-frame* holds the filaments firmly by one end while a comb travels over their surface to remove impurities and short fibers.

The *cutting-engine* acts like a tobacco or chaff-cutting machine, and cuts the parallel filaments into lengths of about 1¼ inches.

The *scutcher* converts these short fibers into a sort of down, which is washed in soap and water, boiled in pure soft water, pressed, dried, scutched to loosen it up, carded, made into slivers, drawn, doubled, drawn, rove, and spun, like cotton.