

Dyeing, the art of staining or coloring yarn or cloth. It has been practiced among Eastern nations from time immemorial; and in the sacred writings we read of the vestments of the high-priest being dyed purple, of linen cloths being dyed blue, purple, and scarlet, and of rams' skins being dyed red. The famous Tyrian purple is believed to have been discovered by an inhabitant of Tyre 1,500 yrs. B.C.; and immediately afterward the Tyrian purple became the badge of royalty, and cloth dyed with it commanded a princely price. In the fixation of color upon cloth recourse is often had to a mordant which acts as a middle agent, and attaches the color to the cloth. The principal mordants are alum, cream of tartar, and salts of tin. Previous to the application of any color the cloth or yarn must be well cleansed from grease, oil, etc., by scouring in soda or in soap, and except where the material is to be dyed of dark color the goods are also subjected to the process of bleaching. In the case of fabrics which require a smooth surface, the preliminary operation of singeing off the loose hairs is resorted to. The following receipts for the D. of cotton apply to 10 lbs. weight of cotton yarn or cloth, which is found to be the smallest quantity capable of being well dyed at one time. The proportions of each ingredient may be altered, however, so as to correspond with the quantity to be operated upon. (See DYE-STUFFS.)

1. *Common Black*.—Take 3 lbs. sumac, and treat with hot water; steep the goods in the hot decoction for some hours; wring out; wash for 10 minutes in lime-water, and for 30 minutes in a solution of 2 lbs. copperas. Wash the goods well in cold water, sometimes repeating the treatment with lime, and rewashing; then work the goods for 30 minutes in a warm solution of 3 lbs. of logwood, and afterward with 2 oz. copperas; work again for 10 minutes; wash and dry.

2. *Jet Black*.—Proceed as at 1, adding 1 lb. of fustic with the logwood; and when three pints of iron liquor are used instead of the 2 oz. copperas, a more brilliant black is obtained.

3. *Blue Black*.—Use indigo blue vat, then proceed as at 1.

4. *Brown*.—Treat the goods with a yellow dye; then work for 30 minutes in a decoction of 2 lbs. lima wood and 8 oz. logwood; lift and work with 2 oz. alum for 15 minutes; then wash and dry.

5. *Catechu Brown*.—Immerse the goods at a boiling temperature in a decoction of catechu; then work for 30 minutes in a hot solution of 6 oz. bichromate of potash. Wash in hot water; if the latter contain a little soap, color will be improved.

6. *Chocolate or French Brown*.—Dye the goods with a

spirit yellow; then treat for half an hour with a solution of 3 lbs. of logwood; raise with a little red liquor; work for 10 minutes; wash and dry.

7. *Red*.—Make a hot solution of 3 lbs. of sumac; introduce the goods, and let stand till the liquor is cold; then wring out, and work in water containing in each gallon a gill of red spirits (prepared by adding 2 oz. of feathered tin by degrees to a mixture of three parts of hydrochloric acid, one part of nitric acid, and one of water in the cold) for 30 minutes; wring and wash well; then work the goods for 30 minutes in a lukewarm decoction of 3 lbs. of lima wood and 1 lb. of fustic; add a gill of red spirits; work the goods longer; wash and dry. The famous Turkey-red is imparted to the cloth by first impregnating it with an oily or fatty substance, and then subjecting it to a decoction of madder.

8. *Yellow or Straw*.—Work the goods in a weak solution of acetate of lead; then wring out and work in a dilute solution of bichromate of potash; wring out and work again in the lead solution; wash and dry.

9. *Leghorn Yellow*.—Proceed as at 8, but add a little arnotto liquor with the solution of bichromate of potash.

10. *Spirit Yellow*.—Work the goods through a weak solution of protochloride of tin for 30 minutes; then work in a solution of quercitron bark for 15 minutes; lift out and work again in tin solution, and wash in cold water.

11. *Orange*.—Proceed as at 8, and afterward pass through lime-water at the boiling-point, finally washing in cold water.

12. *Blue*.—The goods are worked in various strengths of solutions of salts of iron, such as nitrate of iron; wring out; wash in water, and then work in solution of yellow prussiate of potash; wring out, and wash in water containing a little alum. The various shades of blue may be obtained by using stronger or weaker solutions.

13. *Green*.—Dye the cloth blue; then work in red liquor, (acetate of alumina;) wash in water; work in decoction of fustic or bark; raise with solution of alum; wash in cold water, and dry. The darker shades of green, as olive or bottle green, are brought out by the use of sumac and logwood along with the fustic.

14. *Puce or Lilac*.—Work the cloth or yarn with spirits, (see 7,) then in logwood solution at a temperature of 140° Fahr., adding a little red spirits, red liquor, or alum; wash and dry; or dye the cloth blue, (12;) then work in solution of logwood; add alum; wash and dry.

15. *Purple*.—Soak the goods in a warm decoction of sumac till cold; work for an hour in red spirits; wash; work in hot solution of logwood; then add a little red spirits and work again; wash and dry. The various shades of purple may be obtained by altering the strength of the chemicals; the more sumac the browner the hue, and the more logwood the bluer the purple becomes.

16. *Lavender or Peach*.—Work the goods for 20 minutes in spirit-plumb, (a strong solution of logwood, treated with about one sixth of its volume of a solution of tin, made by dissolving tin in six or seven parts of hydrochloric acid, one part of nitric acid, and one of water;) wring out and wash well in cold water.

17. *Safflower Lavender* is obtained by D. the goods a light-blue, then working in decoction of safflower, which places a pink on the top of the blue.

18. *Drab*.—Work the goods in a decoction of sumac; lift; add copperas; re-work; wash in water; then work in a mixed decoction of fustic, lima wood, and logwood; raise with a little alum; wash, and dry. Catechu is occasionally employed.

In the D. of woolen yarn and cloth, the various steeps are used warm, but the washings in water are done cold. Care must be taken to remove every particle of grease from the wool by washing with soda and soap, before it is subjected to the process of D., else the coloring matters will not adhere. The more common colors are obtained as follows:

19. *Black*.—By working the cloth in a bath of camwood; then of copperas; after which wash out; then treat with decoction of logwood and copperas; or work in a bath of bichromate of potash, alum, and fustic; lift and expose to the air; then immerse in decoction of logwood, barwood, and fustic; thereafter of copperas.

20. *Brown*.—The goods are worked in bath of fustic, madder, peachwood, and logwood; then introduce into dilute solution of copperas; or the goods are treated with a bath of bichromate of potash, argol, and alum, washed, and then introduced into a bath of fustic, madder, peachwood, and logwood.

21. *Red*.—By working in a decoction of bichromate of potash and alum, and subsequently in a bath of peach or lima

wood, with a little alum. Scarlet is obtained from cream of tartar, cochineal, sumac, and fustic.

22. *Crimson*.—From cochineal, cream of tartar, and chloride of tin. Cudbear gives a wine tint.

23. *Pink*.—Work the goods in a bath of tartar, alum, cochineal, and red spirits.

24. *Orange*.—From a bath of sumac, cochineal, fustic, tartar, and red spirits.

25. *Yellow*.—From a bath of tartar and alum; then a decoction of bark, sumac, fustic, and red spirits.

26. *Blue*.—Various shades may be obtained from immersion in salts of iron, and then in solutions of yellow prussiate of potash, (see 12.) Also work the wool in a bath of argol, alum, and indigo extract.

27. *Green*.—Work the goods in a bath of fustic, argol, and alum, and thereafter in a solution of indigo. The dark shades of green, such as olive, are brought out by a bath of fustic, logwood, madder, and peachwood, and afterward of copperas.

28. *Violet*.—From cudbear, logwood, barwood or camwood, and peachwood; as also alum. The addition of copperas brings out a puce tint.

29. *Drab*.—The manifold shades of this color are procured from variable strengths of decoctions of madder, peachwood, logwood, fustic, associated with alum and copperas.