Backing 2 dark shades, 2 light shades, 2.28s worsted face, 14 cut back. Filling as warp 75 picks per inch. Finished weight 29 ounces, 56 inches.—From the A. W. & C. R.

PROGRESS IN DYE MAKING.

Notwithstanding the thousand and one coal-tar dyes already known to textile colorists, which would seem to be sufficient to satisfy all the wants of the modern calico printer and dyer, the color chemist still perseveres in his search for new ones, in the hope of finding something possessing some points of superiority. This has always been the case. Dyes have been placed on the market and used for some time, then something better has been discovered, and the old one has gone to the wall and fallen out of existence. One can call to mind such dyes as iodine green, resorcin blue, cyanosin and Perkins' mauve, which have thus been driven out of use by the advent of superior dyestuffs. In the brief notes which follow, says The Textile Mercury, an endeavor is made to indicate the lines on which progress in the discovery of new coal tar colors has been made of late. Some of the dyestuffs noted as having been discovered have been placed on the market, but others have not and will probably never be offered to dyers, as they are deficient in some respects. Still, a note about them will serve to show how rich a store for colors is coal tar and that the field of discovery in dyes is not yet worked out. New dialkylated rhodamines are got by taking rhodamine hydrochloride and heating with phosphorous oxychloride for some hours. Any excess of oxychloride is removed by means of benzine, and the residue heated with diethylamine or diamylamine dissolved in chloroform to form the alkyl-rhodamines. These dissolve in water, giving yellowish to bluish red solutions with a yellowish fluorescence. From paranitraniline a blue dye for unmordanted cotton can be prepared in the following manner: The paranitraniline is diazotized and combined with R salt of naphthol disulphonic acid. This is treated with iron borings and acid to the amidoazo compound, and can be combined with the paranitraniline azo dye to form the blue dyestuff. In the same manner a violet dye can be obtained if the R salt be replaced by alpha naphthol alphasulphonic acid.

As constituents for the production of azo dyes there have been discovered two new chlorosulphonic acids of naphthylamine. Naphthalene is converted into its chlorosulphonic acid in the well-known manner. It is then nitrated with nitric acid, and finally reduced with iron borings, when both the chlorosulphonic acids are formed. These are converted into their sodium salts, and as one acid gives an easily soluble and the other a difficultly soluble salt they can be separated from one another. The formula of the new acids is $C_{10}H_6NH_2ClSO_3H$. When one of these acids is combined with tetrazodiphenyl a bluish red direct dye for cotton is obtained, or if tetrazoditolyl is combined with one of the new acids and naphthionic acid a direct dyeing bluish red coloring matter is the result. Other dyes may also be made on the same lines. A bluish black coloring matter dyeing wool from acid baths can be obtained by diazotizing naphthylamine disulphonic acid, combining the product with alpha naphthylamine, rediazotizing, and combining with one of the new acids. The two acids yield dyestuffs varying in shade from one another.

Rosolic acid, when heated with hydrazine sulphate and caustic soda, gives a red coloring matter of the triphenylmethane series. By using methyl or ethyl-hydrazine other dyes of the same group can be obtained. Dinitro anthrarufin disulphonic acid and the corresponding anthrachrysazin compound, which are derivatives of anthraquinone, are prepared by taking either anthrarufin or anthrachrysazin, sulphonating with fuming sulphuric acid at 100° C., and nitrating at a low temperature. By treatment with potassium chloride the potassium salt of the sulpho acid is obtained in the form of yellow crystals. These potassium salts are treated with a mixture of stannous chloride and hydrochloric acid, the result being that they are converted into diamidoanthrarufin or anthrachrysazin disulphonic acid which form dyes for wool that produce even blue shades from the ordinary acid baths; they will also dye mordanted wool in greenish blue shades. By dyeing the wool with the dinitro compound and then treating the dyed fiber with suitable reducing agents, the blue dye can be formed direct on the fiber. Judging from analogy, these new dyes should yield fast shades of blue.

When the following mixtures are heated with sodium and sulphide and sulphur, or sulphur only, to a temperature of 200° C., dyestuffs are obtained which dye unmordanted cotton in various shades of gray to black, while some are soluble in sulphuric acid, and may be used to dye wool: Hydroquinone and metaphenylene diamine, resorcine and para-amidophenol, hydroquinone and meta-amidophenol; resorcine and para phenylene diamine; and others of similar character. When diethyl amido oxybenzoyl benzoic acid and para amido ortho cresol and similar compounds are heated with sulphuric acid they undergo condensation. The products are alkylated, when phthalein dyes are obtained, which will dye unmordanted cotton in pure yellow red shades. If dimethyl amido oxybenzoyl benzoic acid is condensed with resorcine by means of sulphuric acid, dimethyl rhodol is obtained. In a similar manner diethyl rhodol may be got if the diethyl benzoyl compound be used. If the rhodols are converted into ethers by means of sulphuric acid and alcohol and these ethers into hydrochlorides in the usual way, phthalein dyes which will dye wool, silk, and tannin-mordanted cotton in yellow red tints are obtained. When tetra ethyl para diamido benzhydrol is condensed with meta methoxy benzene sulphonic acid, there is obtained the leuco base of a dye of the triphenylmethane series. By oxidation with lead peroxide the dyestuff itself is obtained. If other benzhydrols having an analogous composition to the one named and other oxybenzene or naphthalene sulphonic acids are used, dyes can be obtained which dye wool from acid baths in shades which are fast to alkalies. Fast azo blues are much to be desired. It is stated that the blue dyes produced by diazotizing a periamido naphthol sulphonic acid with phenyl amido naphthalene sulphonic acid possess the property of dyeing wool in acid baths various shades of blue, fast to acids, alkalies, and light. When the diazo compound of a para amido azo sulphonic acid, such as can be got from amido azobenzene amido azotoluene, etc., is combined with nitro-metaphenylene diamine or the corresponding toluylene compound, dyes are obtained which dye cotton in orange to orange red shades of considerable intensity. The shades are fast to acids, alkalies and light. By taking dimethyl safranine and condensing it with formaldehyde in the presence of acid and then oxidizing with potassium bichromate, a dyestuff is obtained which dyes tannin-mordanted cotton in reddish gray shades, which are fast to washing, soaping and alkalies. If diethyl safranine is used in a similar manner a pure neutral gray dyestuff is obtained. When eosine or dibromofluorescein is heated with sulphuric acid and boracic acid, it is converted into a dyestuff which produces fast green shades with chrome-mordanted wool.

Yellow coloring matters possessing the composition of asymmetric diamido phenyl acridines are prepared by the following process. Dimethyl-para amido benzoaldehyde is mixed with phenyl meta toluylene diamine hydrochloride and heated to 150° C. The melt is extracted with water acidified with hydrochloric acid and the dyestuff is precipitated out of the liquors by salt. Para-amido benzoaldehyde heated with phenyl meta toluylene diamine hydrochloride, with or without alcohol, yields asymmetric diamido methyl phenyl acridine. The new dyes are basic products dyeing tannin-mordanted cotton, and