black F 10 lb Glauber's salt and 1 lb soda After dyeing, treat in a bath with 1 lb copper sulphate and 1 lb acetic acid

Seal Brown—Dye the cotton in a boiling bath with 3 lb chromanil brown 2G 10 lb Glauber's salt, and 1 lb soda; then treat in a fresh bath with 3 lb copper sulphate, 1 lb bichromate of potash and 2 lb acetic acid

Black—Dye the cotton in a boiling bath with 8 lb chromanil black 3BF, 10 lb Glauber's salt, and 1 lb soda; then treat in a fresh bath with 3 lb copper sulphate, 1 lb bichromate of potash, and 2 lb acetic acid

Gold—First dye the cotton with 2 lb toluylene orange G, 10 lb Glauber's salt, and 1 lb soda; afterwards treat in a fresh bath with 3 lb copper sulphate, 1 lb. bichromate of potash, and 2 lb acetic acid

Dark Blue—Dye with 3 lb Zambesi blue BX, 10 lb Glauber's salt and 1 lb soda at the boil for an hour; then rinse and diazotize in a cold bath containing nitrite of soda and hydrochloric acid, afterwards developing with amidonaphthol ether.

Dark Brown—Dye first with 3 lb Zambesi brown 2G, 10 lb Glauber's salt and 1 lb soda; then diazotize with sodium nitrite and hydrochloric acid and develop with toluyene diamine

Black—Dye in a boiling bath with 4 lb. Zambesi blue BX, 1 lb. Zambesi black D, 10 lb. Glauber's salt and 1 lb. soda; afterwards diazotize with sodium nitrite and hydrochloric acid and develop with toluylene diamine and betanaphthol.

CRAPE EFFECTS ON WOOL.

BY E. SIEFERT, IN THE BULLETIN OF THE MULHOUSE SOCIETY.

The success of the crape effects on cotton obtained by means of caustic soda has led to the attempt to produce similar effects on woolen tissues. Nevertheless, so far no practical process has been discovered. There is certainly a patent which proposes to print a mechanical reserve on woolen, gum solution for instance, then to pass through a concentrated acid, sulphuric, phosphoric, etc. Nevertheless, as far as I know, tissues craped in this way have not been put on the market, which proves the non-success of the process. It is some time since A. Zetter, in making attempts to obtain these effects on woolen muslin in a more practical manner, noted that various substances had the property of contracting woolen on steaming.

It is difficult to detail these substances, for they are of very different kinds Nevertheless they are, generally speaking, acids, acid salts, or substances which can act like acids; several of them are energetic reducing agents I may cite principally the bisulphites, stannous chloride, the chlorides of zinc and calcium, tartaric and citric acid, and finally resorcine. As a rule all these substances have to be employed in very concentrated solution. With certain of them, tin salt for instance, it is impossible to obtain the contraction without great deterioration of the fiber. Others, for instance the bisulphites, tartaric and citric acid, the chlorides of zinc and calcium, and more especially resorcine, allow the effect to be obtained with less tendering of the fiber. The operation nevertheless still remains a delicate one. A rather too prolonged steaming, slightly too much pressure, and the tissue is damaged

I have noted the contracting action of sulphocyanide on woolen, and this is very energetic with little damage to the goods The risk of damage, nevertheless, is not the only difficulty Two conditions must be fulfilled to obtain a good result. First of all the steam must have access freely and equally to all the parts of the piece, and seeing that anything beyond the desired action is just what leads to damage, a part of the stuff, the selvedge for instance, must not be craped before the other part has been steamed, as would be the case if the rolled piece were steamed Moreover, although the effect finally obtained on the wool has more resistance to washing than the analagous effect obtained on cotton, in the act of contracting the wool can only surmount a very feeble resistance, whereas cotton steeped in caustic soda contracts with great energy. Therefore if the resistance opposed to the contraction of the tissue be ever so little too much, this contraction will not take place at all. To give an idea of the little energy of the contraction, I will give an example. If a pattern of woolen muslin, printed with a streak of sulphocyanide, is hung up with free play in a steamer, and then steamed much longer than would be necessary, the lower parts of the pattern will be strongly craped, but the effect will gradually die out towards the top, and a yard or so from the bottom will be absolutely nil, the mere weight of the tissue and of the color preventing the contraction from taking place. It will be seen, therefore, that no system of steaming in use will serve to obtain a fine and regular crape effect.

Coloring matters may, of course, be added to the sulphocyanide color Tin salt may also be added and various effects may be got by printing it on to a tissue dyed with a color which it will discharge The woolen thus contracted behaves in the presence of coloring matters differently to simply bleached wool. It has more affinity for the acid coloring matters, and less for the basic colors. The shrinking varies from 15 to 20 per cent.

REPORT ON SIEFERT'S WOOLEN CRAPING PROCESS.

By Camille Schoen and E. Grandmougin.

With the printing color indicated by M. Siefert, we obtained the results he describes. The printing color used was:

1,500 grammes sulphocyanide of calcium
1 litre gum tragacanth water.

Print on to woolen muslin and steam, avoiding all tension, for about five minutes. To obtain color effects the acid coloring matters may be used.

Sulphocyanide of barium acts in the same way. On the other hand sulphocyanide of ammonia, used either alone or with a metallic oxide, does not contract the fiber. Siefert mentions the well-known fact that concentrated acids contract woolen fiber. It has also been proposed (Knecht, Farber Zeitung, 1897), to print on the acid, then to pass through chloride of lime, and to mill the woolen thus locally chlorinated, the chlored wool having lost the property of felting. It may be possible to produce patterns successfully by these processes, but the operation on a large scale would present great difficulties and does not seem to have been used.

Siefert's process on the other hand will be satisfactory on a commercial scale, and will give good results. The substances having the property of contracting wool are very diverse, but it is to be remarked nevertheless that they seem to be substances having an absorptive character like the chlorides of zinc or calcium for instance, or are reducing agents like tin salt, the bisulphites and hydrosulphites. It is not certain, therefore, that they act in the same manner. In the case of tin salt a solution of 150 grammes to the litre will contract the wool, whereas with chloride of zinc a concentration of from 60 to 70 deg Be is necessary, that is to say at least 1,000 grammes to the litre It seems reasonable therefore to believe that some of these substances act like concentrated acids by robbing the woolen fiber of its water, whereas others act like reducing agents, perhaps also taking sulphur from the fiber. The oxide of tin used alone will not crape woolen, but needs the addition of a substance with an acid character. The attack on the fiber varies with the substance used. Tin salt, which crapes perhaps the most easily, has an excessive tendering effect, whereas the sulphocyanides on the other hand do little harm. Used with precaution chloride of zinc does not damage the fiber.

When metallic salts are used a dissociation takes place on