Indian Journal of History of Science, 15 (1) ; 58—70, May 1980

COLOUR MAKING AND DYEING OF COTTON TEXTILES IN MEDIEVAL HINDUSTAN*†

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(*Received 27 September 1978*)

In the medieval period the manufacture of cotton textiles was the premier industry. It is well established now that in the contemporary India, the industry had attained ubiquity and international repute both for its volume and excellence. The allied arts of dyeing, printing and painting the fabrics have correspondingly made their mark on the national and international markets. The present paper sets out an account of some of the processes employed in dyeing and printing cotton fabrics in Mughal India. It further enumerates the formula for obtaining as many as 40 hues detailed in a contemporary treatise. Some illustrative modes of printing and painting of fabrics as occuring in the sources have also been incorporated here. The study is based mainly on the contemporary and near contemporary accounts.

Under the Great Mughals the production of cotton goods by means of non-mechanised processes had reached its peak. In the Hindustani region alone, there were as many as thirty-two reputed centres of this industry.[1] In addition the rural production of cotton goods too was carried on though perhaps to a lesser extent. Consequently, the aggregate volume of these goods was of such a magnitude that after satisfactorily meeting almost all the local effective demand, the exportable surplus was high enough to constitute the chief source of earning foreign exchange or bullion for the Empire.[2]

This ubiquity of the production of cotton goods had resulted in the expansion of the allied arts of dyeing, printing and painting the goods. Block printing and mordenting[3] techniques are said to have originated in the prehistoric antiquity of India and by now some of the major towns such as Delhi[4], Lucknow[5], and

*Paper presented at National Seminar on "Technology and Science in India during 1400-1800 A.D." held at Indian National Science Academy, New Delhi from April 20-21, 1978.

†This paper is a somewhat revised version of Dyeing of Cotton Goods in the Mughal Hindustan 1550-1800, published in the *Journal of Indian Textile History*, Ahmadabad, July, 1967.

Farrukhabad[6] had acquired wider repute in this respect. Aside from the usual chintzes[7], and perhaps plain dyeing, Delhi specialised in an uncommon type of dyeing called tie-dyeing. Its tie-dyed quilts were known far and wide.[8]

The general diffusion and the proficiency gained in the craft of dyeing and printing through constant practice spreading over centuries has attracted the attention of modern scholars. But they have more frequently been interested in the study of dyeing, printing and painting of the coastal or peninsular parts of India, undoubtedly because of their greater commercial importance and easier accessibility to the Europeans. The study of dyeing and printing crafts in the Mughal Hindustan has generally been neglected. Nevertheless, in the nineteenth century some English writers made attempts to consider the subject as obtained in this region either in part or full. But unfortunately these authors seldom specify the sources of their information. No doubt, some of the selected pieces might have been based on personal observations or experiments such as O'Conor's *Note on Lac*, G. Watt's *Pamphlet on Indigo* or T. Wardle's *Monograph on Tusser and other wild silks of India and on the Dyestuffs and Tanning Matters of India.* But the rather exhaustive work of L. Liotard entitled *Memorandum on the Dye of Indian Growth and Production* cannot be similarly explained. Again, William Hoey's somewhat detailed treatment of the proportions of the ingredients used, processes adopted and the shades obtained at Lucknow in his *Monograph on Trade and Manufacture in Northern India*, could not have been based on personal knowledge. Because it is highly improbable that the English staff of the imperial service stationed in India could have taken to dyeing even as a sideline. These writers, it would seem, borrowed their material either from someone actually engaged in the business or some local work specifically dealing with the subject. The clue to the latter alternative was provided by H.M. Sen who mentions a Persian source, again unidentified, as the basis for his article *Mode of Dyeing Kharwa Cloth.*[9]

The *Mir'at ul Istelah* (Mirror of current terminology) of Anand Ram Mukhlis, though really a lexicon, contains some brief notices of dyeing[10] and even of tie-dyeing.[11] An anonymous medical treatise in the Indian Office Library, London entitled *Nuskha Khulasatul Mujarrebat* (A Treatise of Abstracts of Proven Medicinal Prescriptions), however, incorporates a full chapter (twentieth) on dyeing and printing[12]. Transcribed in *c.* 1766, the work must have been written at some earlier date. Unlike most of the political writings of the period the style of the Chapter XX at any rate, is so simple and straight-forward as to suggest a professional hand rather than a drawing room author.

In this chapter of *Nuskha Khulasatul Mujarrebat*, seventy-seven processes of dyeing (inclusive of some printing) of cotton stuffs for obtaining forty-eight shades have been described. Except for the somewhat treated articles such as indigo,

catechu or of course mordants, almost all the ingredients used here are taken raw from the floral kingdom. Or, in other words, readymade dyestuffs were very infrequently used by the Hindustani dyers; each of them preparing his own decoction adding ingredients according to the proportion prescribed in the *Nuskha Khulasatul Mujarrebat*. This may be one of the reasons for the fact that while the existence of dyers is noted as a matter of course in the contemporary narratives[13], the reference to makers or dealers in dyestuffs is rare unless they be *nilgars* (indigo sellers or makers) or *Gulal Saz* or *Ach Farosh* (vermillion makers or sellers)[14]. Whereas the manufacture of indigo was in a flourishing state at Delhi[15], Agra was celebrated for its dyestuffs[16] and even at Lucknow lac dyers were available[17]. It is nevertheless, evident from the above document that the Hindustani dyers and printers during the Mughal period usually combined the two jobs of making the dyestuffs and dyeing or printing the cloth.

The Nuskha Khulasatul Mujarrebat also reflects an essentially crude, complicated and perhaps uncertain process employed in dyeing the stuffs. Printing was of course far more elaborate, but even the plain dyeing was no easy matter, where each shade required a separate set of treatment. Collection of numerous vegetable products, pounding, sieving, boiling, washing, rinsing, drying either in the sun, shade or both, and beating into smoothness, were the methods employed in transforming the bleached material into coloured ones. The implements required were also equally common place articles; something to pound or grind the ingredients, perhaps pestle and mortar, pieces of fine cotton cloth for sieving purposes, large copper vessel to boil the ingredients, at times along with the cloth that is to be dyed, wooden ladle to stir, a large vat to steep the cloth in the coloured solution and a wooden mallet for beating the dyed and dried material into smoothness.

The inexpensiveness and simplicity of apparatus of the dyers of the Mughal Hindustan would also suggest the reason why they preferred putting in some labour and preparing their own colours from cheap natural products to the purchase of relatively costly dyestuffs from the bazar. The same desire to reduce cost to the minimum is also reflected in their occasional use of cheaper substitutes for indigo such as the seeds of plant of *Chaukanda* (*Cassia tara*) yielding a blue dye and which could be fixed by adding lime water.[18] This plant abounded all over India.[19] *Nuskha Khulastaul Mujarrebat* too appears to disregard the employment of indigo where effective alternative could be found. In fact, contrary to one's expectation indigo does not occur in this document even in compounded shades such as bottle green[20], mango green [21] and purple qarari[22] (fixed).

In order to illustrate the processes of dyeing as detailed in *Nuskha Khulasatul Mujarrebat*, a translated version of thirty-two of them is given below in a tabular form.

Details as given in the *Khulasatul Mujarrebat* for Dyeing Cotton Stuffs

No.	*Colour obtained*	*Ingredients used*	*Process followed*	*Reference*
1.	Red: like the *salu* of Burhanpur	Pulp of *halila* (*Terminalia chebula*) weighing a quarter of a seer, *al* quarter of a seer, flowers of *dhao* (*Grisla tomentosa*) quarter of a seer, alum weighing six *dams*[23], *Antia khar* (?) four dams.	Pound them all together, boil it in six seers of water, submit the *chirah* (cloth) in it, turn it with a wooden ladle. When the material has absorbed the dye take it out, rinse it, dry it and then wash it a few times in clean water.	134a-b
2.	*Gul i anar* (like the flower of pomegranate)	Turmeric weighing one *dam*, *Shahab i khasa* (*Carthamus tinctorius*) as desired, sour lemon (weight?)	Pound the turmeric with water, using a piece of cloth. Strain it. Dye the stuff, dry it in shade till it gets damp. Add sour lemon in the *shahab i khasa* (in considerable quantity), dip the damp material in the solution then again dry it in shade.	125a
3.	*Gulabi qarari* (fast pink)	Alum weighing two *dams*, bark of *kachnar* (*Bauhinia variegata*)	Dip the material in alum water, dry it. Boil the bark of *kachnar* in water, clean the liquid, dye the material, then dry it.	125b
4.	*Henadi* (like henna)	Peeled *tun* (*Cedrela toona*) measuring six *dams*, *Shahab i khasa* four dams, something sour.	Boil the *tun* in water, strain it, then add it in *shahab i khasa*. Colour the material in the solution.	117a-b
5.	Orange	Turmeric two dams, *Shahab i khasa* as desired, sour lemon.	Add lemon in the turmeric and *shahab i khasa*. Dye the stuff in the solution.	125a
6.	Purple	Pulp of *halila* equalling half of a quarter of a seer, *Hira Kasis* (Sulphate of Iron) two *dams*, *al* quarter of a seer, flowers of dhao (?)	Pound the *halila* well, boil it in sulphate of iron. Clean it. Submit the material in the liquid, dry it. Boil alum in water, dip the material, dry it. Pound well the flower of *dhao* and *al* together, boil it in water, submit the material in the boiling liquid, keep in turning it with a wooden ladle so that it does	133b-134a

No.	*Colour obtained*	*Ingredients used*	*Process followed*	*Reference*
			not burn and the dye is evenly absorbed by the whole piece. Take *Chirab* (the material) out, rinse it, wash it four times in pure clean water, dry it and then beat it into smoothness.	
7.	*Sausni* (bluish colour)	*nil* (indigo)—(?), *Shahab i Khasa* (?), sour lemon	First colour the material in indigo and water solution. Add sour lemon in *shahab i khasa*, then dye the material in this solution.	125b
8.	*Sabz anboh* (green)	*Kabuli* madder weighing half of a quarter of a seer, rind of pomegranate quarter of a seer alum two *dams*.	All to be pounded together, then boiled. Strain the liquid, dye the material, dry it.	117a
9.	*Sabz pistai*[24] (green pistachio)	Turmeric (?), rind of pomegranate (?), *bahl yab* (?), Alum (?).	Keep the turmeric in water overnight. In the morning peel its upper layer with a knife. Pound it with water, strain it on a clean piece of cloth. Submit the material in the liquid and dry it. Repeat the operation four times. Boil the rind of pomegranate in water, separate the colour (liquid), submit the stuff in it and boil.	118a-b
10.	*Sabz anboh*[25] (green)	Turmeric quarter of a seer, alum six *dams*, rind of pomegranate eight *dams*, henna eight dams, catechu *paparya* four *dams*, bright madder four *dams*.	Pound the turmeric with water, strain it through a piece of cloth. Submit the material in the liquid for about three *gharis* (1½ hours), then wash it clean in plain pure water and dry it. Dip it into alum water, dry it. Pound the rind of pomegranate, henna, catechu together and with water strain it using a piece of clean cloth. Dye the material in this solution, dry it. Repeat this process	a 116b-117

No.	*Colour obtained*	*Ingredients used*	*Process followed*	*Reference*
			a second time. Then add *ahar* in the same solution and again dip the material in it, dry it and finally, beat it smooth.	
11.	Bottle green	Rind of pomegranate quarter of a seer, pulp of *halila* (used for dyeing) quarter of a seer ... of *babul* (*Accacia arabica*) half a quarter of a seer, alum six *dams* (first use), bright sulphate of iron five *dams*. small *kakarsingi* (Pistacia or *Rhus integerima*) quarter of a seer. alum six *dams* (for subsequent use).	Pound together the rind of pomegranate, *babul*, pulp of halila and alum, boil them once in water, clean the liquid (by straining), colour the material and dry it. Pound the sulphate of iron, boil it in water, dip the material in the liquid, dry it. Pound the *kakarsingi* and alum, boil them in water, colour the material, dry it.	122a
12.	Emerald green	*Nil khasa* (indigo) six *dams*, pulp of *halila* (used for dyeing) half a seer, bright sulphate of iron two *dams*, turmeric quarter of a seer, peeled *tun* quarter of a seer, small *kakarsingi* quarter of a seer, rind of pomegranate half a seer, alum half of quarter of a seer, starch.	Powder together the *nil khasa*, pulp of *halila* and sulphate of iron, boil them in water, strain it, colour the material in the liquid. Powder together the *tun*, *kakarsingi*, rind of pomegranate and alum, boil them in water, strain the liquid, colour the material, dry it. Add starch in the same liquid, dip the material, rub it with hand, dry it and finally, beat it.	119a-b
13.	*Kishmishi* colour (like resin).	Alum one *dam*, rind of pomegranates two *dams*. bright kasis two *damri* tamarisk fruit (?), starch.	Soak the piece in tamarisk (solution?), dry it, wash it, dip it into alum water, dry it, wash it. Pound the turmeric with water, strain it, colour the piece in the solution, dry it. Boil the rind of pomegranate in water, strain the liquid, colour the piece, dry it. Then dye the piece in the solution of bright *kasis* and water, dry it, starch it and smoothen it.	119b

No.	Colour obtained	Ingredients used	Process followed	Reference
14.	*Khashkhashi* colour (like poppy seeds).	Indigo—best quality)?, *Shahab* (?), sour lemon (?), starch.	Pound the indigo with water. Soak the material in plain water, rinse it lightly. Mix some drops of indigo and *shahab* in water, dip the material in the solution. If the tint is not as desired add some more drops of indigo and *shahab* until the required shade is obtained. Add sour lemon, starch it and beat it.	125b-126a
15.	*Sandali* (sandal) colour	Vermillion one *dam*, saffron half a *masha*, starch.	Pound the vermillion with water, dye the material, dry it. Boil saffron in water, strain it, colour the material in the liquid, dry it. Add starch in the same liquid, dip the material, dry it.	122b
16.	*Udah gardri* (violet fixed)	Pulp of halila (use for dyeing) 3/8 seers, alum half a quarter of a seer, bright madder half a seer, iron shavings two *dams* or *kath* as desired, *sajji* four *dams*, starch.	Pound the pulp of halila, mix it in water, colour the material, dry it. Mix alum in water, dip the material, dry it. Pound the madder and iron shavings, boil them together in water, throw the material in the boiling liquid and keep turning it with a wooden ladle. When it is properly boiled add finely powdered *sajji* and let it boil on for a while so that the material absorbs the dye. Take the material out, dry it, wash it with water four times. If *kath* is to be used, mix it in water, dip the material and then finally starch it.	126b-127a
17.	*Udah qarari* (violet fixed) with blackish tinge	Pulp of *halila* (use for dyeing) quarter of a seer, rind of pomegranate quarter of a seer, alum five *dams*, *al* one seer.	Pound together halila and rind of pomegranate well, mix them in water, dip the piece in the solution and keep it in the sun for a day. Powder alum, mix it in water,	126a-b

No.	*Colour obtained*	*Ingredients used*	*Process followed*	*Reference*
		flower of *dhao* four *dams*, starch, *Kath*.	dip the piece, and keep it in sun for two days. Pound *al* and *dhao* flower fine, boil them in water, throw the material in the boiling liquid, keep turning it with a wooden ladle, let it boil until the material absorbs the dye. Take it out, wash it with plain water five times. Mix *kath* in proportion to blackishness required, in water, dip the material and colour it. Add starch in the same solution and again dip the material.	
18.	*Badanjani* (like brinjal)	Pulp of *halila* (used for dyeing) quarter of a seer, sulphate of iron two *dams*, alum six *dams*, *patang* (sapan wood) quarter of a seer, *antia khar* four *dams*.	Pound the pulp of *halila*, boil it in water, clean it, dye the material in the liquid, dry it. Boil sulphate of iron and alum together, clean it, dip the material, dry it. Pound the sapan wood fine, add *antia khar*, boil them, strain the liquid, dye and leave the piece for a while in it, then take the piece out, dry it. Then once again dip the piece in the same liquid, dry it.	134b
19.	*Shutri* (camel colour)	*Tun* (?), *shahab* (?) sour lemon (?), starch.	Boil the peeled *tun* in water. Submerge the material in plain water, rinse it. Similar to the *nabati* colour, add some drops of *tun* colour and *shahab* in water, submerge the material in it and test the shade obtained. If necessary, add some more drops of the *tun* and *shahab* colours, but be careful as not to put too much of *shahab*. Add sour lemon and starch, dip the material, dry, then finally beat it.	131a

No.	*Colour obtained*	*Ingredients used*	*Process followed*	*Reference*
20.	*Jozi colour* (like walnut)	Rind of pomegranate quarter of a seer, alum four *dams* (for first use), pulp of *halila* (used for dyeing) quarter of a seer, sulphate of iron one *dam*, catechu *paparya* half a quarter of a seer, bark of *babul* half a seer, alum six *dams* (for the subsequent use).	Pound together the rind of pomegranate, alum and pulp of *halila*, boil them in water, strain the liquid, colour the piece, dry it. Pound the sulphate of iron and catechu, boil them together, strain the liquid, submerge the piece, dry it. Then boil together the bark of *babul* and alum, strain the liquid, colour the piece, dry it.	133a-b
21.	*Gharib* colour	Bark of *babul* in a quantity that after peeling the darkish skin quarter of a seer remains.	Keep the bark of *babul* in water for a month. In winter, keep it in sunshine; if summer, then in shade. The remaining water should be adequate for submerging the material. After the expiry of a month, strain the solution through a piece of cloth. Dip, dye, dry the material in shade. Repeat the process thrice. Finally, wash the material in clean water or river, dry it and beat it.	132a
22.	*Akbari* colour (fugitive)	Alum two *dams*, dried mango juice (from the Deccan) four *dams*, *iksir* (elixir) two *dams*, peeled tun two *dams*.	Submerge the material in solution, dry it. Powder the *tun*, boil it in water, strain it, dye the material, dry it in shade. Pound the dried mango juice with water, strain it through a piece of cloth, add water in sufficient quantity to dip and dye the material, repeat the last process in the same solution, dry it in shade. In fact, for obtaining this particular hue all drying should be done in shade.	128a-b
23	*Malagiri*[27] colour	Henna.....[28] *shahab i khasa* half a quarter	Mix in the shahab in such a quantity that the material	127b

No.	*Colour obtained*	*Ingredients used*	*Process followed*	*Reference*
		of a seer, rind of pomegranate half a quarter of a seer, bright madder half a quarter of a seer, small kakarasingi half a quarter of a seer, alum four dams.	may be submerged in it. Dye the material in this solution, dry it in shade. Boil the rind of pomegranate, colour the material in this liquid, dry it in shade. Boil the madder, colour the piece, dry it in shade, again dip it in alum water.	
24.	*Akbari* colour (fixed)	Alum four *dams*, *mazu*[30] two *dams*, bright *kasis* two *dams*, vermilion one *damri*[30], peeled *tun* four *dams*, *shahab i khasa* half a quarter of a seer.	Submerge the material into alum water, dry it in shade. Pound *mazu* with water, strain it on a piece of cloth, dip the material in the solution, dry it in shade. Boil *kasis* and vermilion in three seers[31] of water until only two seers of water remains, strain the liquid, add so much water as is adequate for soaking the material, dry it in shade. Pound the *tun*, boil it in water, strain it, add more water in sufficient quantity, add *shahab* as well. Dye the material in the decoction, dry it in shade.	128a
25.	*Ambari*[32] colour (like amber)	Turmeric (of best quality) quarter of a seer, alum two *dams*, *shahab i khasa* half a seer, sweet and clean water three seers, lemon quarter of a seer, starch.	Pound turmeric with water, strain it, dye the material in the solution, wash the material twice or thrice. Submerge the material in alum and water solution, dry it. Add *shahab* in the three seers of water, steep and leave the material in the solution for a while. Rub the lemon with water, strain it, add it in the *shahab* solution, again dip the material, rub it with hand, take it out. Add starch in the same solution, let the material absorb it, dry the piece.	124b-125a

No.	*Colour obtained*	*Ingredients used*	*Process followed*	*Reference*
26.	Almond colour	Peeled *tun* quarter of a seer, alum two *dams*, saffron (?)	Pound and boil the *tun* in water strain it. Submerge the material in plain water, dry it in the *tun* liquid and finally add a bit of saffron to lend it a reddish hue.	123a
27.	*Mubarak Shama' i*	*Tun* (?), *Shahab* (?).	Soak the piece in plain water, add a few drops of the *tun* and *shahab* colours in water, dip the piece, go on adding both the colours in the solution until the desired shade is obtained.	131b
28.	*Gul i tura' i*[33] colour	Turmeric (?), soap (?), lemon (?).	Keep the turmeric in water overnight, remove the skin in the morning with a knife, pound it with water, strain it through a piece of cloth, dry it. Mix it with soap water, dye the material, dry it. Then wash it with pure, clean water so well that the odour of soap may disappear. Dry it in shade, dip it in alum water, dry it.	120a
29.	*Gul i champa*[34] colour	Peeled *tun* half a quarter of a seer (for *dastars*-turbans four *dams* of *tun* would be enough).	Boil the *tun* in water, strain the liquid, dye the material	117a
30.	*Kam numa* (like a bud?)	Catechu *paparya* half a quarter of a seer, henna half a quarter of a seer, alum four *dams*.	Boil the three ingredients together, strain the liquid, dye the material, dry it in shade.	127b-128a
31.	*Kafuri sandali* (Camphor sandal like).	Alum one and half a *dam*, peeled *tun* four *dams*, tamarisk fruit (?), starch.	Steep the material in a solution of tamarisk fruit and water, dry it, wash it. Dip it into alum solution, dry it. Powder the *tun* well, boil it in water, dry it, starch it and glaze it.	123a
32.	*Nakhudi* (like gram).	Rind of pomegranate two *dams*, henna one *dam*, alum four *dams*, saffron one *masha*[35]	Boil all the ingredients together, strain the liquid, then dye the material.	122b

NOTES AND REFERENCES

[1] For example, Sialkot, Lahore, Samana, Sarihind, Delhi, Agra, Farrukhabad, Jaunpur and Banaras etc. For a detailed list see Naqvi, H. K. *Urban Centres and Industries in Upper India*, Bombay, 1968, pp. 137-41. Also see Naqvi, H.K., Progress of Urbanisation in United Provinces, *JESHO*, Leiden, Vol. x, Part 1, 1967, pp. 88, 90, 95; and Naqvi, H. K. Industrial Towns of Hindustan in the 18th century; *Transactions*, Simla, 1969, Vol. VII, pp. 243-47.

[2] Naqvi, H. K., *Urbanisation and Urban Centres under the Great Mughals*, Simla, 1971, p. 3; *Urban Centres* etc., pp. 269-70.

[3] Mordants are agents used for fixing the pigments of colours in the fibres of cloth. "It is usually a soluble salt of aluminium, chromium, iron or tin precipitated on the fibres along with the dye by an alkali. Mordant and the dye then form a lake which adheres strongly to the fibres and this gives fast colour." Forbes, R. J., *Studies in Ancient Technology*, Leiden, 1957, Vol. IV, p. 132. As most of the dyes are fugitive by nature, the use of mordants was very frequent. In Hindustan lemon, rind of lemon, lime, alum, green dried mangoes, flower of *kapas*, nuts of *bhalawan* (semicarpus anacardum), myrobalan, sulphate of iron, etc. were employed as mordants during the Mughal days.

[4] '*Ajaib i Duniya* (Anonymous, India Office Library, London, Ms.) 181 b; Travels of Manrique 1629-1943. tr. Hakluyt Society, Second Series, Oxford 1927, Vol. II, p. 180; W. Foster, *The English Factories* in India, Oxford, 1906-1927, 1637-1641, p. 134.

[5] Hoey, W. *Monograph on Trade and Manufacture in Northern India*, Lucknow, 1880, p. 84; Mukherji, T. N., *Art Manufactures of India*, Calcutta, 1888, p. 351.

[6] Liotard, L., *Memorandum on the Dyes of Indian Growth and Production*, Calcutta, 1881, p. 132.

[7] '*Ajaib*, 181 b; Manrique, II, 134, E.F., 1637-41, p. 134.

[8] '*Ajaib*, 181 b; also see Liotard, 139.

[9] It appeared in *Journal of Asiatic Society, Bengal*, II, 1833.

[10] For example lemon or bist quarari shades, *Mir'at* British Museum Ms. pp. 274, 469-70.

[11] *Mir'at*, pp. 462-63.

[12] Medical treatises sometimes impart very useful bits of information relating to economic details, for example in addition to this work see *Tibb i Sikandari*, A Medieval Treatise of Sikandar (Add. 1751, the British Museum Ms.). It was completed by the Sharqi Minister Bhawwa bin Khwas Khan in the reign of Sultan Sikander Lodi. The work was actually entitled *M'adan-usb-shefa Sikander Nama*, A Mine of Curatives or the Book of Sikandar, but the former name is more popular.

[13] Bayat, Bayazid, *Tarikh in Humayun wa Akbar*, (History of Humayun and Akbar), Calcutta, 1941, pp. 197, 200, Bhayya Anand Ram, *Dastur ul' amal*, I.O.L. Ms., f. 73a; *Nuskha Khulasatul Mujarrebat*, 126 by 127a; 128b etc.; F. Buchanan, *An account of the Districts of Bihar and Patna*, Patna and Calcutta, II, p. 649; W. Hoey, 165. Such instances could easily be multiplied.

[14] Buchanan, II, 649.

[15] Manrique, II, 18c.

[16] E. F., 1618-21, p. 261.

[17] Hoey, 40.

[18] Wardle, T., *Monograph on the Tusser*, etc., London, 1878, p. 20.

[19] ——, p. 20.

[20] *Nuskha Khulasatul Mujarrebat*, 117a.

[21] Ibid.

[22] Ibid., 126 b-127 a. Generally purple could be obtained by compounding red and blue. Letters of Coeurdous, *Journal of Indian Textile History*, Ahmedabad, Vol. II, 1956, pp. 26-27.

[23] One *dam* = 1/40th a rupee (or 172½ grains).

[24] Not very legible.

[25] It is not indicated in the source what difference in effect, if any, was obtained by the employment of either of the processes for *sabz anboh*. As alum has been used in both the cases, though higher proportion has been prescribed in the second one, the shades obtained would not be altogether fugitive.

[16] The author adds that it is available at the dyers. It appears to be some kind of a black dye or some stuff yielding a black dye. For further employment of ready-made dyestuffs *see* Nons. 19, 27.

[17] It is a tree with light unveind wood, when pounded it looks reddish white, *A'in Akbari* tr.by Blochman, Vol. I, 87.

[18] The text here reads "...*Numa shutari* ..." which may be translated 'like camel'. The real meaning is thus not clear.

[19] A plant yielding a blackish cherry like fruit, generally used for medicinal purposes.

[20] 1/80th of a rupee.

[21] 1.3 (avoirdupois), Moreland, *India at the Death of Akabar*, 1962.

[22] For quite a detailed description of '*Amber*' see A.A., I. 83. Perhaps yellow white the best variety would be the '*Ambari*, shade.

[23] *Tura'i* is a kind of cucumber and has bright yellow flowers.

[24] Yellow colour A. A., I. P. 81.

[25] $1.3 \times 1/80 \times 1/12$ lbs (see *tola*)