CHAPTER VI

DYEING

The dyeing and bleaching of the various plaits are the next important processes towards making a straw hat.

The dyeing of straw plait in England, done individually for some time on a small scale, commenced as a separate industry about 1845, when a Mr. Randall opened some dyeing works at Sundon, a village about four miles from Luton. Black, and a very poor brown and dark blue, were the only colours then dyed. Shortly after Mr. Thomas Lye, who came from Kirkby Malzeard, near Ripon, Yorks, which was a plait making centre, started business as a dyer in Luton. His gamut of shades numbered only four or five, and the standard of colour then demanded was very low. Mr. Lye’s first signal success was a “grey,” which at that time no. other competitor had attempted. In 1857 his business was transferred to its present site. Other colours quickly followed, and the invention of aniline dyes revolutionized the old “vegetable dye” processes, of which the ingredients were madder, indigo, logwood and fustic. These wood dyes required a long and costly process, and involved the use of mordants to prepare the straw for the different colours, and their somewhat cumbersome methods rendered them at all times rather uncertain in their results. With the advent of the more easily handled synthetic dyestuffs the operations of wood dyeing became less frequent, and although to-day black is still produced from logwood chips, practically all colours are dyed with one or the other extracts of
coal tar, etc. The main considerations of dyeing are brilliance of shade with perfect evenness of colour, and penetration of the dye right through the straw. Unlike some textile fabrics, fastness either to light or even to water is not insisted on; but absolute penetration is a necessity, for should any part of the straw when plaited become abraded, if the colour were only on the surface, the worn part would show a lighter tint; and also if when the "button" or centre of the hat was made, the turning of which being in such tiny circles, the straws are disturbed to their utmost, and the light coloured spaces which would result would impair the regularity of colour. And the dyeing penetration of straws or straw plait, composed as it is of such diversity of elements, the hard flint like exterior and the soft pappy inside, is a matter of considerable difficulty, even if dyers had not to contend, first, with the extreme hardness of water which is common in the South Bedfordshire district, and second, the constant cleansing necessary on changes in fashionable colours necessitating the use of coppers, the chemical effects of which in some instances need counter action to achieve a good result.

The question of penetration of the straw is one that has keenly exercised the minds of straw dyers from the inception of the industry. Many are the opinions as to the best medium for rapid and regular penetration. And many are the formulae given as being most suitable agents. It is probable that straws, grown on different geological formations and thus having different varieties of silicate exteriors, require different baths of softening chemicals, and that one bath, excellent for the straw plaits of China, would be inefficient for the straw plaits of Italy. Generally speaking, however, these baths are formed of water with some neutral salt, such as sodium acetate; or of an alkaline solution of sodium
carbonate with ammonia. But the less that is done in the way of such softening before dyeing the better; because the longer straw plait is boiled the more it is impoverished. And as these preliminary processes involve boiling in every case, impoverishment must take place, and where alkaline solutions are used the results are especially poor. Another objection to the use of softeners is that they tend to loosen the straws of the plait, and as each process involves manipulation, the handling of the loosened plait tends to break it considerably.

Yet another objection is that certain shades of colour are most adversely affected by the previous use of such agents, in fact some tones cannot be produced at all on plaits thus treated. While in a few cases it is perhaps necessary and advisable to employ a softener, in by far the greater number the best results are those obtained from that formula which involves the fewest processes and the shortest time of boiling, and this can best be obtained where dyestuffs are used that do not require any previous preparation of the plait.

The dyeing of straw is almost invariably done at the boil. The dyeing matter, with any necessary addition, is put into the vat or copper and well mixed with the requisite amount of water. The plait is then introduced and laid carefully and regularly so that when pressed down the solution may cover it.

The vats (which are made of wood) and the coppers are all furnished with a steam perforated copper coil at the bottom. Over this at a slight distance, so that the heated pipes cannot come into contact with the plait, is laid a perforated tray, be it of wood or copper. The plait is laid, as described above, on this tray, and when sufficiently pressed down is covered with a perforated copper lid to prevent the plait from rising above the
surface of the dyebath. This is then brought to the boil and continued for sufficient time, according to the nature of the material and colour required, to ensure perfect penetration and regularity. This time may vary from even less than twenty minutes to several hours. When the desired shade is achieved, which is proved by testing, the plait is lifted carefully from the dye bath on to a crated topped carrier, similar to a funeral bier. Formerly on arriving at the drying shed the plait was put on rods and thoroughly shaken to cast off as much moisture as possible, and then hung in the air so that the drying might not be too rapid and thus render the plait brittle. Now the plan is to place the plait, when taken from the copper, in a centrifugal wringer or "hydro-extractor," which, revolving at great speed, throws off all free moisture and leaves the plait almost dry. Placed then in a chamber with large power-driven fans, the drying process is most speedily completed.

Before dyeing, for easy handling, all plait is "strung." Every piece of plait is received either wound up in "sticks," as they are technically termed, or in some looped formation which allows a fine string to be easily threaded through and tied in such a manner as to form a means of either carrying the piece or of hanging it on a wooden rod. These rods are made of convenient thicknesses and length to carry the plait in the drying departments (be it in the room, or in the open air), when suspended either in the former case on trestles mounted at suitable distances, or in the latter on lines fixed to uprights and stretched across the drying area. Each lot of plait for dyeing carries a numbered wooden "tally," the number corresponding with the dye ticket left in the office or "giving out" room. When dry by means of these tallies, the plait is collected into its
original lot, and is carefully tied up in suitably sized bundles. Some plaits receive, when dyed, a "finish" of a glucose mixture which has two effects, it gives better gloss to the material and it assists in preventing the colour coming off during the manufacturing processes. These mixtures are all of a starchy or farinaceous nature, in which some substance, say "farina" itself, is dissolved in water, brought to a boil and rendered crystal in appearance before being used for the finishing process.

Some plaits are of one colour throughout, but are made with straws that have been previously dyed. Generally speaking, especially for straws, the effect is not so good as where the plait itself is dyed. There are, of course, one or two exceptions where the fibre used is very delicately plaitted into some loose design which would not retain its crispness of outline under the weight of water in dyeing and the necessary handling. Other plaits known as "Speckled," must, from their nature of mixed colours, be plaitted from dyed straws. Of these there are coloured and natural, coloured and white, and mixtures of various colours. The dyeing of straws follows in the main the dyeing of plait, but the preparation is somewhat different. The straws, cut into equal lengths, are tied up in bundles about 5 ins. in diameter, and are carefully placed in the vat or copper in an upright position with as little pressure as possible, and when dyed are dried still in the bundle. At one time a new dyeing effect on straws was introduced, which consisted of standing the bundles upright and allowing strong dye to run through the "pipes." This, of course, dyed the interior and some parts of the exterior, which not touching another straw allowed the dye to do its work. Water was then passed through the "pipes," and the result when dry was a pretty mottled effect. Another fancy method of dyeing was the production
of "Ombré" colours. This novelty, introduced by the French dyers, consisted of two or more colours on the same plait. It was done by means of a fine spraying machine, which vaporized a powerful dye on to an already dyed piece of plait of some lighter tint. Messrs. Lye & Sons brought out a novelty on straw plait, particularly effective on the Japanese wide patterns, which produced the same iridescent effect that is obtained on "shot" silk. This, however, was bath-dyed and not sprayed. These various bases of double tones were utilized to their undoing, for it was no uncommon sight to see manufacturers of the lower grades of hats endeavouring to produce multicoloured effects on chip plaits by pouring the prepared dye over the plait from finely nozzled watering cans! The resultant crudeness of such arrangements brought a beautiful thing into disfavour. The shade requirements of to-day include many colours that are termed "Pastel." These are delicate, pale shades, and can be obtained only by submitting straw plait to a bleaching process previous to dyeing, but the finished article is a thing of extreme beauty, not only on the question of colour, but in its intense purity and softness. A method for dyeing plaits, which obtained considerable magnitude in Paris, but has never been a favourite in Great Britain, is that known as "Cold Dye." It enjoyed only a small measure of success on straw, but on chip and hemp braids very beautiful results have been achieved. In 1877 Mme. Deuxbouts, of Paris, was dyeing chip plaits in this manner, which is that used for feathers, and in 1878 at the Exposition Universelle, her exhibit in this direction was superior to that shown by any other house. It is now used for dyeing crinoline and those silk plaits which would be spoiled by heated baths.

Such are the main features of dyeing, past and present,
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on the various plaits utilized in hat making, and in this art, for it is no less, England has shown the way to the rest of the world. To-day other countries, such as the United States, Switzerland, Germany, Italy and Japan, have achieved signal success in dyeing, in fact on some fibres a few foreign dyers are more successful than those at home. This is probably due to the careful skill of the dyer, combined with the more favourable nature of the water used.