MANY ANCIENT DYEING RECIPES FOR WOOLLENS HAVE COME INTO USE LATELY

Scarcity of Synthetic Dyes has Resurrected Methods Obsolete for Years in View of Abnormal Conditions Following Declaration of War and Closing of German Markets to the World.

As a consequence of the famine in synthetic colors many dyers have been compelled to resort to methods which have been obsolete for years, and in view of the abnormal state of things the following matter may be of some service to the trade, says the Yorkshire Observer in a recent issue. The art of dyeing forty years ago was a much more complicated business than it is at the present day; the dyer had plenty of materials to his hand, but the application of them had to be made in a far more roundabout way. This naturally made the dyer's craft highly skilled, and trade secrets were a big feature. As artificial colors gradually replaced first one and then another of the natural dyes, the trade underwent a slow but steady revolution, with a disappearance of much of the mystery and also a large reduction of the salaries paid to foremen dyers. The old-time dyer had a fair number of reds and yellows at his disposal, but was crippled in the number of his blue coloring matters, having practically to get all his blues and greens with indigo, logwood, and prussiate of potash.

Indigo was used both in the vat form and as the so-called extract of indigo, which is an entirely erroneous name for it; as the product is simply indigo rendered soluble by sulphonating, and has nothing whatever of the nature of an extract about it. The methods of indigo dyeing then were the old fermentation vats, made up of indigo, lime, woad, bran, molasses, and a number of substances capable of setting up bacterial fermentation. Without doubt these vats were a dirty, wasteful system of utilizing indigo; and if they were not carefully attended to they had various ailments which destroyed their dyeing power. For instance, the fermentation might proceed to excess and the vat go sour, or the reverse might occur, and the bacteria supplying the ferment be allowed to die, and so waste the liquor. All these things had to be watched and the temperature carefully attended to, and at the same time, an even balance had to be maintained between too slow and too rapid fermentation. Some of these vats are still in use, particularly for very heavy milled cloths, which are difficult to penetrate without long working in the dye, but the few that are in use are worked upon more scientific lines, and are not loaded up with rubbish as they were formerly.

Advent of Chemical Vats.

Chemical vats were used for cotton many years ago —notably the copperas and lime vat, which was worked cold, but until the coming of Schutzenberg and De Leland's patent, which was better known as the hydro-sulphite vat, all indigo vats for wool were on the fermentation principle. When first introduced, the user of a hydro-sulphite vat had to prepare his own hydro-sulphite with bi-sulphite of soda, zinc dust, and freshly slaked lime, but as time went on the indigo was sent out in a better form—that is, as a fine paste—while the reducing agent was also improved. To what extent this vat might have been improved it is impossible to say, but its decline began with the introduction of synthetic indigo, and the final blow to its use was the highly perfected state in which German hydro-sulphite was put upon the market as a readily soluble white crystal. Growers of natural indigo made no serious attempt to compete with the synthetic, with the consequence that the artificial product, owing to constant booming from German (and some English) chemists, quickly ousted its rival. Natural indigo is not exactly the same dye as the artificial and for deep, heavy shades the plant dye is superior to its rival, while indigo blacks can actually be dyed with strong vat liquors made from the natural dye.

Old Blues and Greens.

With only four dyes available, that is, vat indigo, indigo extract, logwood and prussiate of potash, the old-time dyer had to get his blues, greens, and olives, while if purple was required archil or cudbear was used to top it with. Anything like a brilliant pure blue of a very light shade could not be got, the nearest being the prussiate or royal blues on cotton, and the Saxony or indigo extract blues upon silk. Prussiate or spirit blues, as they were then termed, were very extensively dyed, and for full shades which are usually required for woollen cloths the results showed colors equally satisfactory to wear and light. Alkalies turned these prussiate blues a brown shade, but they stood acids and bleaching powder well. Used alone they gave a greenish shade of blue, but this could be altered by topping with a red dye. Logwood, together with the redwoods, gave useful clarets, but used as a blue dye it was only fit for dark shades. Notwithstanding their looseness to light, there have been many hundreds of thousands of blues dyed with logwood, topped, to improve the richness of the blue, with a little archil. The latter dye is itself by no means fast to light, but it has very good levelling powers. Very fast and bright greens were dyed by giving the cloth a blue bottom in the vat and topping with fustic, and this was the method usually employed for all the best billiard cloths.

A similar shade could be got equally well by using indigo extract and fustic, but the color produced was not nearly as fast. With his red coloring matters the old dyer had a bigger choice and could ring the changes on madder, camwood, barwood, peachwood, sandalwood, etc., in addition to cochineal, kermes, and lac-dye.

A number of these dyestuffs gave very fast colors, particularly camwood, barwood, and saunders, and browns and olives could be dyed which were quite as permanent as any colors now used. For such shades as bright crimson or geranium the best results were got by using cochineal, together with a tin mordant, these colors then being known as "in-grain scarlets." Reds obtained by the cochineal and kermes group of dyes were very costly, and brilliant pure scarlet cost twenty times as much to dye then as it does now.

With yellow dyes the dyer was even better equipped, having no less than eight in general use. These were made up of safflower, old fustic, quercitron, young fustic, Persian berries, weld, tumeric, and arnatto. Taking all the materials at his disposal, the dyer had plenty of good yellow dyes, those of fustic, weld and querciton showing a fastness equal to nearly all the synthetic yellows, and in many cases greatly superior.

Of course the vegetable dyestuffs were all mordant colors, and required two separate baths to develop and fasten the dye. The only exceptions were indigo extract, vat indigo and archil, and there were no convenient acid dyes which would go on to the wool direct. Together with these natural coloring matters a variety of agents known as spirits were used, both to act as mordants and as developers of the shade, their composition having a basis of metallic tin dissolved in hydrochloric acid, with other additions such as sulphuric, nitric, and oxolic acids. These were known as blue, red, purple, and finishing spirits, according to the color they were used for, each dyer then marking his own by rule of thumb, as no chemical equivalent was thought of. In those days there were in use a large variety of tartars and argols, which were neither mordants nor dyes, but intermediate bodies between the coloring matters and the mordants, decomposing only slowly by boiling and hepling to keep the dyes solid and level. White tartar is used along with some mordant dyes at the present time, where high-class work is involved, but the use of red or white argols, which are simply very crude tartrates of potash, is of little value.

Some Old Working Recipes.

The following recipes are taken from an old manuscript book belonging to the writer; they are actually working recipes, as attached to each is a small dyed pattern which has been cut from the goods. Although at least forty years old, all the colors are fresh and show no signs of fading, which may be due to them all being full and deep in shade. Although it is not likely that the old methods of producing these colors will ever be permanently revived, they may be of some use as makeshifts while the present shortage lasts, and at the time they were in vogue woolen cloth was a much more sterling article than it is to-day. At the period these recipes were used the woolen pieces would be twenty-five to thirty yards long, 50 in. wide, and from 24 oz. to 32 oz. per yard.

No. 1—Brown (four pieces unions.—Mordant, 3½ lb. bichromate of potash and three quarts d.o.v. double oil of vitriol. Boiled for one hour, and dyed with 80 lb. fustic, 15 lb. camwood grips, and 15 lb. saunderswood.

No. 2—Brown (four pieces unions).—Mordant, 4 lb. bichromate of potash and five pints d.o.v. Boil for an hour and dye with 40 lb. fustic, 40 lb. saunderswood, and 40 lb. logwood.

No. 3—Claret (three pieces unions).—Mordant, 2 lb. bichromate of potash and four pints d.o.v. Boil one hour and dye with 24 lb. alum, 8 lb. argol 13 lb. logwood, 40 lb. saunders, and one pint d.o.v.

No. 4—Claret (four pieces pilots).—Mordant, 27 lb. alum ad five pints d.o.v. Dye up with 40 lb. peachwood, 10 lb. logwood, 8 lb. fustic, 14 lb. camwood, 4 lb. soda, and one quart ammonia.

No. 5—Olive (four pieces unions).—Mordant, 4 lb bichromate of potash and six pints d.o.v. Dye with 40 lb. fustic, 15 lb. saunderswood, 15 lb. camwood grips, and 6 lb. logwood.

No. 6—Blue (four pieces unions).—Boil for one hour and a half with 6 lb. prussiate of potash, six quarts blue spirits, and 16 lb. logwood. Then add six pints finishing spirits and 16 lb. logwood, and continue boiling until up to shade.

No. 7—Blue (three pieces doeskins).—Boil one hour and a half with 6 lb. prussiate of potash, six quarts blue spirits, and 18 lb. logwood. Then add six pints finishing spirits and 18 lb. logwood.

No. 8—Blue (four pieces woolens).—Start cold with 6 lb. prussiate of potash, six quarts blue spirits and 12 lb. logwood. Raise heat to 150 deg. F., run for one hour, then add three quarts finishing spirits.

No. 9—Blue (four pieces woolens).—20 lb. supertartar, 16 lb. logwood, and 4 lb. aniline blue.

No. 10—Blues (four pieces woolens).—3½ lb. aniline blue, 16 lb. alum, 12 lb. red argol, 32 lb. logwood, and four pints d.o.v.

No. 11—Green (three pieces doeskins).—Mordant, 3 lb. bichromate of potash and three pints d.o.v. Boil one hour and dye with 20 lb. logwood, 30 lb. fustic, one pint extract of indigo, and 6 lb. alum.

No. 12—Green (four pieces).—Mordant, 2 lb. bichromate of potash and two pints d.o.v. Dye with 4 lb. alum, five quarts extract, 15 lb. fustic, and 2½ lb. logwood.

The last two recipes for blue mention aniline, but no particulars are given of either brand or maker. It will be noticed in glancing over these recipes that the dyes are not calculated as percentages upon the weight of the cloth, but upon the number of pieces—a system which is usual in dyeing textiles in bulk. The term "union" in connection with the above recipes means a dyed cotton warp, so that only the grey woolen is to be dyed.

Dyes in Most Demand To-day.

The present shortage is most acute in the acid wool dyes, particularly blues and blacks, which are used in big quantities for the low trade. Blues for this class of work must be bright in shade, as they have the dark grey or brown background to contend against, while if stripping is done the ground is changed to a yellow shade of buff, which is no help in dyeing a bright blue. Again, logwood can be used for a number of blues and blacks upon worsteds, assisted in fastness by using small percentages of the after-chromed dyes along with it, but the two-bath process is not quick or cheap enough for the union trade, while chromotrope dyes are also deficient in brightness, and too expensive for it in addition. Myrobalans, fustic, logwood, and indigo have all climbed up to exorbitant prices lately, and acid blues and violets (coal tar) are simply out of reach. Never before has there been such a pulling out of the old tins and casks which always accumulate in dye-house store rooms, and such a general using up of old stock.

At the termination of the present war there is every possibility that prices for dyes will mount still higher than they are, as the demand will increase and stocks abroad have been lessened instead of increased by the constant call for explosives, which require much of the raw materials, such as carbolic acid, tuluol, strong acids, etc. Moreover, neutral countries are depleted of both dyes and raw materials, of which rosaniline constitutes the main requisite for acid blues and reds.

Two very old allied colors for wool have come into use again at enhanced prices. These are archil and cudbear, both of which are developed from a colorless principle contained in certain lichens. These two dyes give reddish purple shades, and are extremely sensitive to acids and alkalies, while they do not stand the action of light well, nor are they fast to scouring and milling. Worked with ammonia these dyes give shades inclining to purple, while acids destroy the blue tone and convert them into reds.

Oxidized aniline black is used very extensively upon cotton for dyeing one of the fastest black known. Its application to wool is much more difficult, but the following old recipe may interest those who wish to experiment on these lines:—

For 2 lb. wool, dissolve 3 oz. permanganate of potash and 4½ oz. of Epsom salts in 5 gallons of hot water. When cool enter the wool and allow to soak until the liquid retains merely a slight yellow color. Squeeze the wool, and without washing enter in 2 gallons of cold water, made up with 20 oz. spirits of salts in which are dissolved, 12 oz. aniline oil. After soaking in this and squeezing, the wool is washed in a weak bath of carbonate of soda, then oxidized by steeping in a solution of 1 oz. bichromate of potash in 3 gallons of water.

Other old recipes are as follow:—

Logwood Blue (on 100 lb. Material).—Boil for two hours with 13 lb. alum, 6½ lb. argol, 2½ lb. tin crystals, and ½ lb. sulphuric acid. Allow the wool to lie all night, and then dye with 40 lb. logwood and 1 lb. carbonate of soda.

For a dark blue upon 110 lb. of cloth—Boil for an hour with 5½ lb. alum, 2¾ lb. red argol, 17 lb. chromate of potash, and 2¾ lb. bichloride of tin. Allow to cool in the liquor then dye for one hour at the boil with 22 lb. logwood and 11 lb. extract of indigo.

Golden brown upon 110 lb. of cloth.—Boil out 88 lb. fustic, and add to the liquor 27 lb. kaliatura wood, 8¾ lb. turmeric, and 5½ lb. argo. Boil for an hour, lift, add 5½ lb. blue stone; boil for half an hour and sadden with 5 oz. copperas.

Brown upon worsteds (10 0lb.)—Mordant for two hours at the boil with 2 lb. bichromate of potash, 2 lb. argol, and 1 lb. tin crystals. Boil in a fresh bath for an hour a bag containing 10 lb. redwood, 40 lb. fustic, and 4 lb. logwood. Take out the bag, and add to the same liquor 10 lb. cutch, 10 lb. camwood, 1½ lb. madder, and 2 lb. argol. Allow all to boil fifteen minutes, cool, enter the cloth, and boil for an hour, after which the shade is saddened by the addition of 2 lb. each copperas and blue stone, and the goods boiled for a further fifteen minutes.

HON. W. J. BRYAN,

United States Secretary of State, who signed the note of protest to Germany. It was written by President Wilson.

COBALT ORE SHIPMENTS TOTALLED OVER 2,000,000 LBS.

Cobalt, Ont., May 15.— The ore shipments from the Cobalt camp, for the month of April make a total of 2,308,093 pounds. The Mining Corporation of Canada was the biggest shipper, sending out a total of 808,708 pounds, made up of shipments from Cobalt Lake, City of Cobalt and Townsite mines. The former sending out only two of a total of 11 cars shipped.

Petersen Lake sent one car of 73,475 pounds, and Seneca Superior, 72,465 pounds, all of which went to Debora.

From South Porcupine the Dome Lake Mining Company sent out two cars of gold ore to the American Smelting and Refining Company, totaling 123,700 pounds.

The Alexo mine at Porquois Junction continues its heavy shipments of nickel ore to Conniston. From April 7 to May 1 a total of 18 cars, containing 1,330,000 pounds of ore, were shipped.

Nickel Ore.

Date	pounds.
April 7th	83,000
April 7th	67,600
April 7th	63,200
April 7th	73,403
April 8th	68,700
April 10th	66,600
April 16th	71,400
April 12th	86,100
April 13th	92,400
April 14th	84,500
April 14th	60,200
April 15th	78,900
April 16th	71,900
April 16th	70,600
April 19th	68,300
April 19th	89,900
April 23th	60,300
April 21st	71,900
Total	1,330,000

Cobalt Ore.

Mine.	pounds
Coniagas Mines	36,150
McKinley-Darragh	311,005
Dominion Reduction Co.	140,000
Mining Corporation of Can.	808,708
Peterson Lake Mining Co.	73,475
Seneca Superior Ore	72,465
LaRose Mines, Ltd.	291,465
Temiskaming Mining Co.	87,800
Beaver Consolidated Mines	137,025
Total	2,308,093

Gold Ore.

Dome Lake M. & M. Co. 123,700

COMMERCIAL FAILURES.

New York, May 15.—Commercial failures this week in the United States, as reported by R. G. Dun & Company, are 412, against 429 last week, 447 the preceding week and 336 the corresponding week last year.

Failures in the Dominion of Canada number 62, against 59 last week, 65 the preceding week and 40 last year.

GOLD FROM FRANCE.

London, May 15.—This week the Bank of England received £8,000,000 in gold from France. This shipment apparently has had no unfavorable influence on the Paris Exchange rates, and it is believed that even £2,000,000 gold shipments which have been arranged will not appreciably affect the Paris market.

LIST OF MEN SELECTED TO GOVERN NEW YORK EXCHANGE

New York, May 15.— The New York Stock Exchange has selected the following committee to serve for the ensuing year:

Committee of arrangements—Dexter Blagden, Winthrop Burr, F. C. DeVeau, Albert R. Fish, H. T. B. Jacquelin, Erastus T. Tefft, Blair S. Williams.

Committee on admissions—C. Ledyard Blair, Dexter Blagden, Jay F. Carlisle, Bayard Dominick, Donald G. Geddes, Albert E. Goodhart, Wm. A. Greer, W. W. Heaton, Ernest Groesbeck, Henry C. Lawrence, Charles M. Newcombe, Wm. H. Remick, E. H. H. Simons, Henry K. Pomroy, James H. Wainwright.

Arbitration committee— William Gibson Borland, Winthrop Burr, Le Roy Frost, Wm. A. Greer, J. S. Halle, W. Strother Jones, Wm. C. Van Antwerp.

Committee of business conduct—Winthrop Burr, E. V. D. Cox, F. C. DeVeau, James B. Mahon, E. H. H. Simons.

Committee on clearing house—E. V. D. Cox, Bayard Dominick, W. Strother Jones, E. H. H. Simons, Samuel F. Streit.

Committee on commissions—Wm. T. Floyd, Henry C. Lawrence, Eugene Meyer, Jr., Erastus T. Tefft, Wm. L. Remick.

Committee on constitution—Louis E. Hatzfeld, James H. Jenkins, Albert H. Marckwald, Newton E. Stout, Blair S. Williams.

Finance committee—S. L. Cromwell, Wm. T. Floyd, Robert Gibson, R. T. H. Halsey, Arthur Turnbull, the president and treasurer.

Committee on insolvencies—Albert E. Goodhart, Henry C. Lawrence, Wm. H. Remick.

Law committee—C. Ledyard Blair, Winthrop Burr, Ernest Grossbeck, James B. Mabon, Henry K. Pomroy.

Committee on securities—E. V. D. Cox, W. W. Heaton, J. S. Halle, H. T. B. Jacquelin Newton E. Stout.

Committee on stock list—W. W. Heaton, Eugene Meyer, Jr., Henry K. Pomroy, Wm. H. Remick, Willis D. Wood.

Committee on quotations—Wm. C. Van Antwerp, E. V. D. Cox, R. T. H. Halsey, F. C. DeVeau, Le Roy Frost.

The governors of the institution adopted a resolution praising the successful and admirable administration of the institution's affairs by President H. G. S. Noble during the past year.

HIGHER P. & O. DIVIDEND.

London, May 15.—The directors of the Peninsular and Oriental Steam Navigation Co. have declared an interim dividend of 5 per cent, comparing with 3½ per cent. a year ago.

The declaration is very gratifying after the passing of the dividend of the Royal Mail Steam Packet Company; but the directors state that the higher dividend must not be regarded as an increase; it is merely a decision to equalize the half-yearly payments at the rate of 10 per cent per annum.

Hitherto the board has paid 3½ per cent. interim and 6½ per cent. final dividends.

Still, the fact that the directors are prepared to pay the larger sum at the present juncture is taken as an indication of the satisfactory condition of the company's affairs despite the war.

MR. ALEXANDER MACKENZIE NEW PRESIDENT BRAZILIAN TRACTION

Toronto, Ont., May 15.—Mr. Alexander MacKenzie was unanimously elected president of the Brazilian Traction, Light and Power Company at a meeting of the board of directors held yesterday to fill the vacancy caused by the death of Dr. F. S. Pearson.

Mr. MacKenzie was for many years general counsel and resident vice-president for the company in Brazil.

He was also unanimously elected as president by the boards of the following companies: Sao Paulo Tramway, Light and Power Company; Sao Paulo Electric Company and the Rio de Janeiro Tramway, Light & Power Company.

LONDON TRAMWAY EMPLOYES STRIKE.

London, Eng., May 15.—Employes of the London Tramway Company went on strike to-day because of the refusal of a war bonus. 3,000 men refused to go to work ,completely disorganizing traffic in the city and compelling thousands to walk to work. Busmen are expected to join the strike which, it is feared, will become general.

INCORPORATIONS AT OTTAWA.

Ottawa, May 15.—The following companies have been incorporated—F. R. MacMillan, Ltd., Saskatoon, $250,000; Will P. White, Ltd., Toronto, $150,000; The Opinicoh Ranching Company, Kingston, $50,000.

EXACTLY SUITED TO PRESENT OCCASION

President Wilson's Note Receives All But Unanimous Approval in the American Union

U. S. JUSTLY AGGRIEVED

Germany Must Apologise or Accept Stigma of An Outlaw Nation and Deliberately Provoke New Quarrel—Adequately Voices Rights of Neutrals.

New York, May 15.—"We are not obliged and have no right to set up ourselves as the protectors of British shipping." This is the way the Free Press, of Cincinnati, Ind., comments on President Wilson's note to Germany. This paper, which is published in a hot-bed of German-Americans, however, is almost alone among the great newspapers of the United States in taking the pro-German view that the destruction of the Lusitania was due to a "brutal threat to starve a nation." Below are additional comments to those wired yesterday:—

BOSTON GLOBE.—President Wilson has not shirked a grave responsibility. The American note clearly shows that Germany must relent or take whatever consequences we may decide to adopt.

Is a Great State Paper.

BOSTON HERALD.—President Wilson has never written a great state paper more exactly suited to the occasion. We hope most fervently that, in a spirit of reasonableness, Germany will coincide with the enlightened position set forth with clarity and power by the President.

BOSTON JOURNAL.—President Wilson's words are those of a patriot. We cannot believe that a nation which is bound by so many ties of friendship to this nation is so far possessed by war madness that she will fail to heed the message.

BOSTON POST.—The note is all that such a message from a justly aggrieved nation to the aggressor nation should be. In it is the voice of the American people at its finest and best. It is a powerful appeal to German sanity.

PHILADELPHIA PUBLIC LEDGER.—The Administration has spoken and spoken to the point. The German Government cannot have the slightest doubt, as to its meaning. Will Germany listen to the voice of prudence before it is to late?

Upholds Nation's Honor.

PHILADELPHIA INQUIRER.—We have not always agreed with the President of the United States, but when it comes to a question of the nation's honor the President must be upheld. The note is written deliberately and coolly. There is not a word spoken in haste.

PHILADELPHIA RECORD.—The note is in every respect a masterly document. It puts the German Government squarely in the position of choosing whether it will obey the dictates of conscience, reason and humanity, and retain the friendship of the United States, or accept the stigma of an outlaw nation and deliberately provoke a new quarrel. There can be no mistaking the concluding paragraph of the American note.

CHICAGO TRIBUNE.—Whatever the fate of our relations with Germany, the President undoubtedly has voiced the sentiment of the nation upon the use of the submarine and as to the rights of neutrals on the high seas.

Cannot Stop Under Sea War.

CINCINNATI FREE PRESS.—That part of the note dealing with the loss of lives in the Lusitania catastrophe more properly ought to have been directed to London. England alone is responsible for the Lusitania's destruction through her brutal threat to starve a nation. Germany cannot stop the under sea war without surrendering herself bound hand and foot to a brutal enemy. We are not obliged and have no right to set up ourselves as the protectors of British shipping.

BALTIMORE AMERICAN.—It has avoided nothing, it has migitated nothing, and it shows no spirit of truckling. Germany must now either concede the position of this country or stand outlawed before the world.

CLEVELAND PLAIN DEALER.—Three paths are open to the Kaiser. One will remove from Germany the stigma of outlawry and restore her to her position of honor among the nations. One will definitely confirm her voluntary withdrawal from the brotherhood of civilization. The third is a crooked path of quibble and procrastination. There is ground to hope that Germany will choose the best way.