

ANCIENT SUNRISE®

Compound Henna



Dark Auburn



Light Blond



Auburn



Light Auburn



Light Brown
Light Chestnut



Reddish Blond



Blond



or Faded Ha

**B. PAUL'S
HENNA**

COMPOUND

*For Coloring
Gray Hair*

Why have Gray or Faded Ha

**B. PAUL'S
HENNA**

COMPOUND

*For Coloring
Gray Hair*

Catherine Cartwright Jones PhD

Compound henna: Part 1

Henna, *lawsonia inermis*, has ONE translucent dye color, rusty red-orange, based on the lawsone molecule precursors naturally produced in the henna leaf. The commercially available henna hair dyes that come in “colors,” such as black, brunette, chestnut, blonde, and so on, are *compound hennas*. These products have additives to change the color of henna. The additives may be other plants, toxic metallic salts, chemical dyes, ingredients that have quasi-spiritual claims, and para-phenylenediamine to create a range of colors. These hair dyes often contain little henna, or possibly even no henna whatsoever. Sometimes these compound henna dye additives are harmless, others are dangerous. If the additives and adulterants are not declared, they can cause all sorts of health problems as well as destructive cross-reactions if they come in contact with the chemicals used in oxidative dyes.

The added ingredients in compound hennas are often not listed or the declarations may be fallacious if the countries of origin do not require declarations for cosmetics, or if the manufacturer chooses to obfuscate for profit. If exported to the west; there is no requirement that the additives be discovered and declared. The pre-packaged henna compounds are often termed “natural herbal henna.” This is misleading as these are not “natural” products; they are full of synthetic chemicals. Metallic salts alter and fix color in lieu of higher quality henna. The compounds of henna and metallic salts can react disastrously with synthetic hair dye, seriously damaging hair. The most frequently used material is lead acetate, though silver nitrate, copper, nickel, cobalt, bismuth and iron salts have also been used. Dyes with lead acetate gradually deposit a mixture of lead sulfide and lead oxide on the hair shaft. When you hear that henna has “metal,” “lead,” or “coats the hair,” and “leaves it brittle,” a compound henna dye is being referred to, not pure body art quality henna¹ such as Ancient Sunrise®.



Compound henna advertising “Pure Herbal Henna” containing PPD (para-phenylenediamine), and 2 Nitro (2-nitro-p-phenylenediamine), hazardous oxidative coal tar dyes.

¹ In 1999, Catherine Cartwright-Jones first termed “body art quality henna” on hennapage.com to refer to henna that was free from additives, contaminants, and adulterants. The henna industry since has taken up the use of “body art quality henna” to differentiate compound henna from pure henna.

A Historical Perspective of Compound henna: Henna hair dye in United Kingdom and French marketplace in the nineteenth century



Frederick Sandys – ‘Proud Maisie’ also known as ‘Love's Shadow,’ 1860-68

Henna was an exotic import entering the European market through the trade pathways of North Africa and the Ottoman Empire to England, France, and Italy in the 19th century. The Pre-Raphaelite Brotherhood painters² were fascinated with the color range and reflectiveness of henna. Frederick Sandys painted Proud Maisie with shimmering hennaed hair. John William Waterhouse, Dante Gabriel Rossetti, John Everett Millais, and Sir Edward Burne-Jones painted women whose hair was henna-consistent tones of strawberry blonde, vivid red, and auburn. They often mixed Orientalist elements into their paintings, having an interest in other aspects of Persian, Ottoman, Arab, and North African culture.

² Founded in 1848 by Dante Gabriel Rossetti, William Holman Hunt, and John Everett Millais, later including William Michael Rossetti, James Collinson, Frederic George Stephens, and Thomas Woolner.



William Holman Hunt, self-portrait, 1875, Uffizi Gallery, Florence, Italy

William Holman Hunt, one of the founders of the post Pre-Raphaelite Brotherhood, appears to have also hennaed his beard for this self-portrait, and taken a keen interest in men's Oriental garments following his trip to the Holy Land in the mid 1850's. His self-portrait at age 17, from 1845,³ shows that he had unremarkable light brunette hair. A portrait in 1900 as an old man shows his light brunette hair again, with a white beard.⁴

Even without formulas and import records, these paintings demonstrate a popular culture rising enthusiasm for henna in the mid-19th century in the United Kingdom. The poem, "Lalla Rookh," indicates that henna and its cultural context had been in popular English awareness at least a few decades earlier.

“While some bring leaves of henna, to imbue
The fingers' ends with a bright roseate hue,
So bright, that in the mirror's death they seem
Like tips of coral branches in the stream;
And others mix the Kohol's jetty dye
To give that long, dark languish to the eye
Which makes the maids, whom kings are proud to cull
From fair Circassia's vales, so beautiful.”

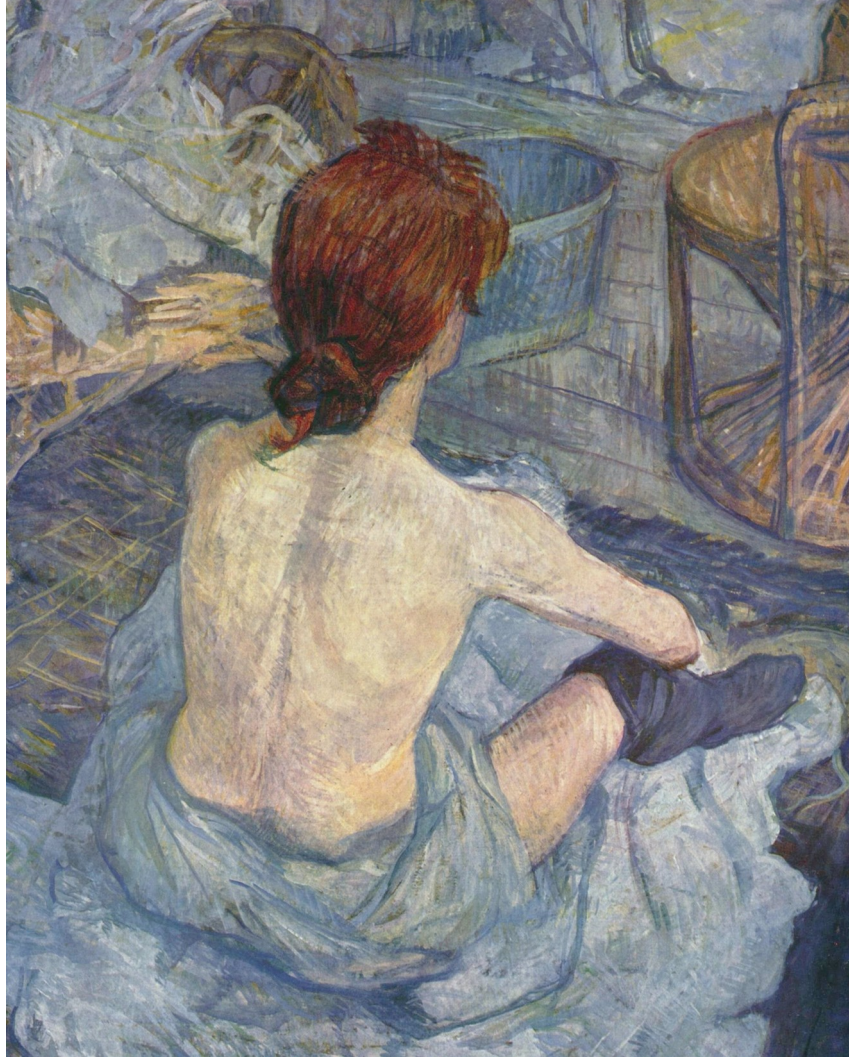
From “Lalla Rookh,” 1817, by Thomas Moore ⁵

³ William Holman Hunt, self-portrait, 1845, Birmingham Museum and Art Gallery, Birmingham, UK

⁴ William Holman Hunt by Sir William Blake Richmond, 1900, National Portrait Gallery, London. NPG 2803

⁵ Moore, T. *Lalla Rookh, an Oriental Romance*, Thomas Y Crowell & Co. New York 1884, p. 52

Note on “The fingers' ends with a bright roseate hue, “They tinged the ends of their fingers scarlet with henna, so that they resembled the branches of coral.” – *Story of Prince Futtun in Bahardanush*



Henri de Toulouse-Lautrec, *Rousse, La Toilette*, 1889⁶

In Paris in the 1890's, Henri de Toulouse-Lautrec painted women of the Moulin Rouge, favorite cafes and brothels who adopted the fashion of hennaed hair. In a number of studies, he documented the range and luminosity of hennaed hair, from golden yellow to auburn, particularly in the way it caught sunlight and stage lighting. Judging by the sketches, lithographs, and paintings of Paris popular culture during the Fin de siècle, pure henna was widely used, safe, and very fashionable.

Hair dyeing during the Belle Époque was considered vaguely naughty.⁷ Some of this sense of impropriety may have been 'tut-tutting' caused by the dangerousness of hair dyes other than henna. Hair dye chemistry was rudimentary, experimental, based on textile dyes, and often hazardous. The actress, Caroline Otero, was seriously burned in 1909 when several drops of the

⁶ Henri de Toulouse-Lautrec, *Rousse (La toilette)* 1889, Musée d'Orsay, Paris, Bequest of Pierre Goujon 1914

⁷ Zdatny, S, ed. (1999) *Hairstyles and Fashion, a Hairdresser's History of Paris, 1910 – 1920*, Berg, Oxford, UK, p. 17

lotion she was pouring on her head came in contact with a water heater.⁸ The public prosecutor of the Seine Department registered 142 complaints relating to hair-coloring torts in 1902, and the fear of burns, rashes and hair loss was endemic.⁹ In 1915, “Bulgarian colors” had a rush of popularity: blue, green, and mauve colored hair, probably coal tar derived lake dyes.¹⁰ The risk to the dyer was as great as to the client, but the increased and reliable revenue from the monthly upkeep was attractive enough for salons to commit to the practice.



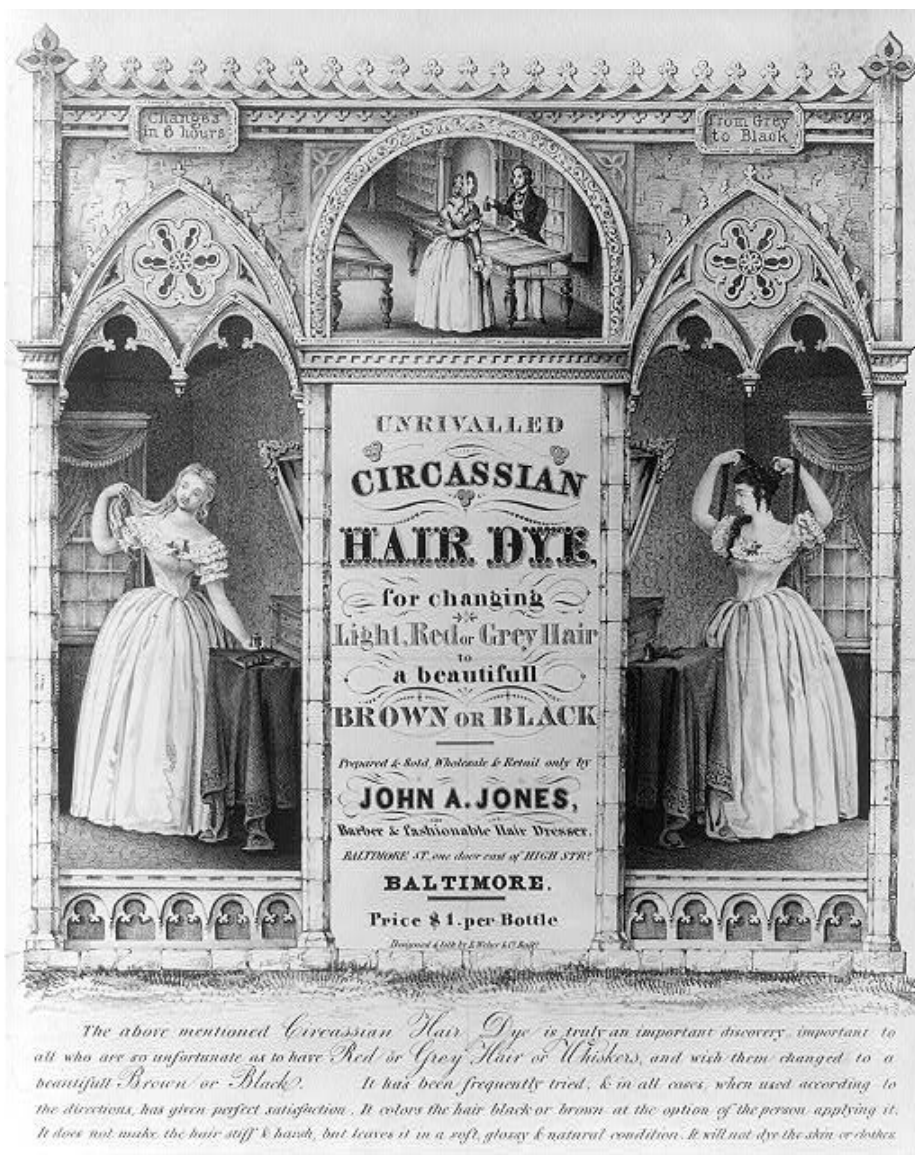
Brothel workers with hennaed hair by Henri de Toulouse-Lautrec, *Salon de la rue des Moulins*, 1894 – 5, Musée Toulouse-Lautrec, Albi, France

⁸ *Journal de la Coiffure*, February 1904

⁹ *La Coiffure de Paris*, October-November 1909, p. 14

¹⁰ Zdatny, S, ed. (1999) *Hairstyles and Fashion, a Hairdresser's History of Paris, 1910 – 1920*, Berg, Oxford, UK, p. 17, from HWJS, April 1915

Historical Perspective of Compound henna: Rasticks, Liquid Rasticks, Henna-Reng, and Henna-Rastiks



Circassian Hair Dye, copyright 1843, Library of Congress USA. The product description and date is consistent with the export of rasticks as hair dye

19th century London chemist and perfumer Septimus Piesse reported on Armenians in Constantinople formulating cosmetics, specifically a black hair dye based on rasticks.¹¹ In Armenia, pyrites, (FeS₂), were mined for rastik powdered cosmetic compounds and used throughout Persia for darkening eyebrows and moustaches. M. Landerer described the formulation of this black hair dye: pulverized galls were kneaded with oil to make a paste, heated

¹¹ "Turkish Hair Dye" *Scientific American* 18, no. 19 (1868): 296.

in an iron pan until the oil vapors were released. The residue was then titrated with water into a paste, and heated to dryness again. A metallic mixture from Egypt called *Rastikopetra*, or *Rastik-Yuzi*, powdered fused iron and copper, was mixed into a moistened gall mass, and a perfume added. The word “rastik” meant eyebrows, and “yuzi” meant stone, thus the name *Rastik-Yuzi*, eyebrow stone, was a cosmetic to blacken eyebrows. This compound metal mixed with gall powder was rubbed into hair and beards to blacken them, or mixed into henna to dye the hair. The proportions of the Turkish rastick beard dye were specified by Redgrove:¹²

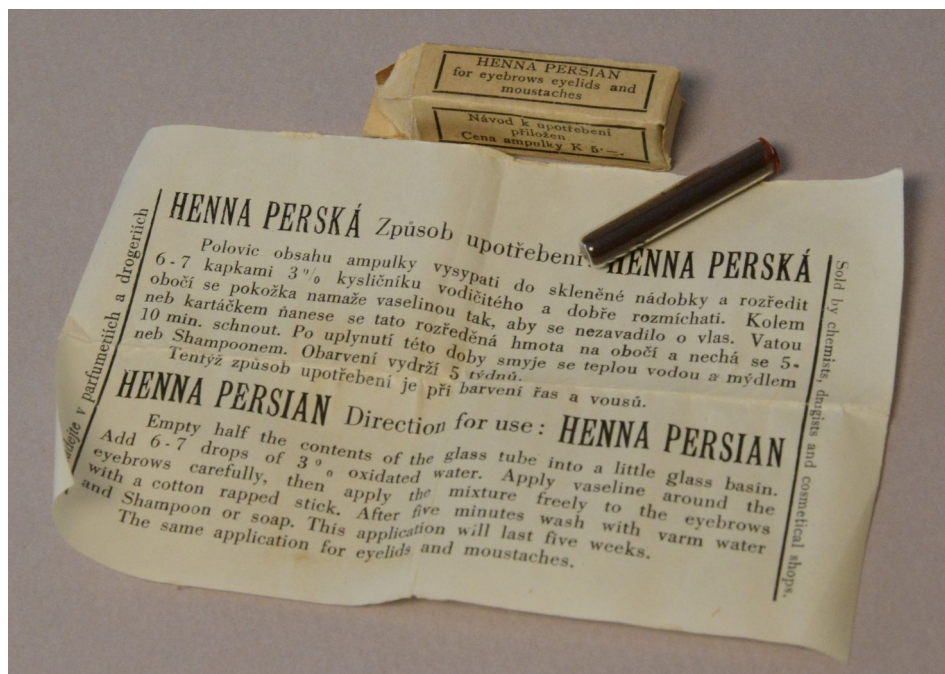
Powdered galls: 2000 parts

Iron filings: 50 parts

Copper filings: 2 parts

Musk: 2 parts

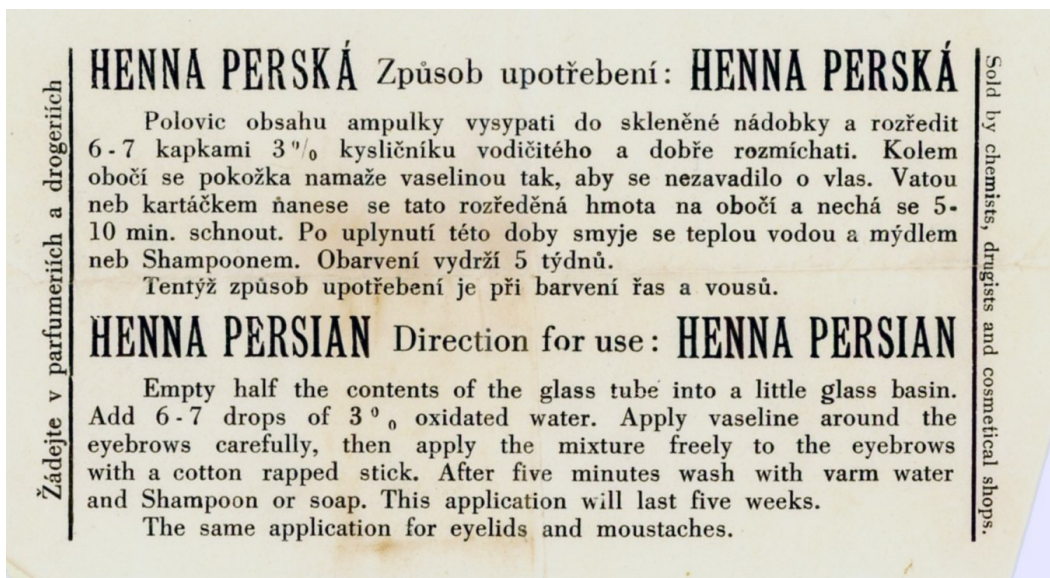
This was applied as a pack in hair and left for several hours, then washed out. The pyrogallol on the surface of the hair rapidly oxidized to a dark brown color. This rastick left the hair dull-looking and copper often causes contact dermatitis. When mixed with henna, the rastick metal compound was less damaging to hair.



Rastick from Persia, HENNA PERSIAN for eyebrows, eyelids, and moustaches” early 20th century, by GABMAR & Co. Ispahan (sic) Persia. The glass vial of rastik is about 1” long.¹³

¹² Redgrove, H. S., Foan, G. A., Woolss, J. B., (1939). *Hair-Dyes and Hair-Dyeing Chemistry and Technique. A new edition completely revised by H.S. Redgrove and J. Bari-Woolss, etc.* William Heinemann. (Medical Books LTD. London p. 48 – 49

¹³ Collection of Catherine Cartwright-Jones PhD



Rastick from Persia, “HENNA PERSIAN for eyebrows, eyelids, and moustaches” packaging insert sheet. GABMAR & Co. Ispahan (sic) Persia, early 20th century

Liquid Rasticks

Liquid rasticks were developed and patented in France by Schueller in 1907, (French Patent No. 383,920) based on a method of using a reduction agent in combination with pyrogallol solutions and metallic salts. The darkening reaction between pyrogallol and the metallic salt was kept in check by an oxidizing agent such as sodium sulphite until the liquid was applied to the hair. The liquid rastick on the hair surface darkened through a reaction with atmospheric oxygen.¹⁴ These liquid rastick dyes were the basis of progressive dyes, the hair dyeing solutions of metallic salts. The most commonly used metallic salts for liquid rasticks and progressive dyes were and are salts of lead, bismuth, antimony, iron. These hair dyes were and are still potentially toxic, and can have violent chemical cross reactions with perming and oxidative dyes.

Two commercial brunette hair dye versions of rastick based on pyrogallol and copper were published based on the analyses of proprietary hair dyes by the British Medical Association¹⁵ in 1912. “Under suitable circumstances, pyrogallol will combine with strong sulphuric acid to produce pyrogallol-sulphonic acid. According to a German invention, the alkaline salts of this substance are suitable for hair dyeing and are said to be less poisonous than pyrogallol itself.”¹⁶

¹⁴ Ibid p. 49

¹⁵ *More Secret Remedies: what they Cost and What they contain, Based on Analyses made for the British Medical Association.* London, 1912,

¹⁶ Redgrove, H. S., Foan, G. A., Woolss, J. B., (1939) *Hair-Dyes and Hair-Dyeing Chemistry and Technique. A new edition completely revised by H.S. Redgrove and J. Bari-Woolss, etc.* William Heinemann. (Medical Books LTD. London, p. 50

| | No. 1 | No 2. |
|-----------------------------------|--------------|--------------|
| Pyrogallol | 3.8 parts | 2.1 parts |
| Copper Chloride (anhydrous) | 1.8 parts | 1.3 parts |
| Hydrochloric acid (B.P. strength) | 0.75 parts | 0.3 parts |
| Sulphuric Acid | 0.07 parts | nil |
| Water | To 100 parts | To 100 parts |

Current men’s progressive hair dye products are based on a solution containing lead acetate that is applied daily, to gradually, “progressively” dye the exterior of the hair dark as the salts to absorb oxygen from the air. This daily application and oxidation gradually colors gray hair darker. These dyes were advertised as a way to “blend away the gray” for men who wanted a “touch of gray” for the social advantage of maturity without actually appearing elderly, and a more natural appearance with a less abrupt hair color change than would occur with oxidative dye. Men could be spared the embarrassment of people noticing that they were dyeing their hair. Metallic, or progressive dyes, are avoided in salon practice as they have adverse chemical reactions with oxidative dyes, permanent curling solutions, and hair relaxers.



This postcard, published around 1920, shows a liquid hair dye being used to darken hair, as was done with liquid rasticks composed of iron, copper, pyrogallol, hydrochloric acid and sulphuric acid.¹⁷

¹⁷ From image collection of Catherine Cartwright-Jones PhD

Henna-Reng

In Persia and other countries, partially fermented indigo was applied with henna to create brunette and black hair dyes. The resulting colors were stable, reliable, and conveniently matched the range of human hair color. The henna-reng dyes were, and are, very safe and beneficial for hair. Redgrove notes that in a warm country where indigo is produced and there is a source of live henna vat readily available, dying ones hair with henna and indigo is easy, harmless, and results are reliable.¹⁸ When the fermented indigo had to be dried, powdered, and exported long distances, the indoxyls were vulnerable to damp and cold, so that when the product traveled from Persia to England, stylists often got inexplicably poor results. The synthetic indigo developed by Adolph von Baeyer in 1878 and perfected in 1897, was unsuitable for hair dye, as the sequence of precursor and intermediate dye molecules are not available to dye hair as described in “Ancient Sunrise® Chapter 5, Plants that Dye Hair.”¹⁹



Empty cloth bags of Iranian partially fermented indigo (vashma) for henna-reng hair dye

Vashma, partially fermented indigo was exported from Iran in cloth bags to the USA for henna-reng. This packaging was vulnerable to air, freezing, and dampness, so that the intermediate indoxyl dye molecules were prone to oxidation to the inert pigment indigo. Until air freight, light-proof and waterproof packaging became available towards the end of the twentieth century, henna-reng was unreliable.

For more reliable results than provided by damaged henna-reng, G. Rozier in *Formulaire de Parfumerie* recommended brunette mixtures with 5 in 1000 parts of potassium dichromate be

¹⁸ Redgrove, H. S., Foan, G. A., Woolss, J. B., (1939) *Hair-Dyes and Hair-Dyeing Chemistry and Technique. A new edition completely revised by H.S. Redgrove and J. Bari-Woolss, etc.* William Heinemann. (Medical Books LTD. London, p. 77

¹⁹ Ancient Sunrise® Chapter 5, Plants that Dye Hair

http://www.tapdancinglizard.com/AS_henna_for_hair/chapters/chap5/5_Indigo_Indigofera_Tinctoria.pdf

added as an oxidizing agent to equal parts of henna and indigo for dark chestnut color, and three parts henna and seven parts indigo for black. Redgrove discouraged the addition of potassium dichromate to henna-reng because it was poisonous.²⁰ Redgrove proposed Gastou's formula for henna rastik as safer: 30g of ferrous sulphate, 30 grams of powdered galls, and 60 grams of henna, mixed with warm water, and applied in the hair as a pack for two hours, then washed out.²¹

Even when packaging and export problems were solved, the knowledge of henna-reng (henna-indigo) technique chemistry seems to have been fractured and forgotten over several decades of disuse. The understanding that henna and indigo require different pH environments to produce the dye intermediate, and produce them at different speeds was ignored by the hair dye industry so that producers mixed henna and indigo powder together, giving consumers poor results in pre-mixed, boxed henna.

Henna-Rasticks

When vashma indigo was unavailable or the precursor-intermediate dye chemistry of natural indigo was misunderstood, henna was formulated to produce brunette and black colors by combining henna with rastick dyes to create the wide range of compound henna shades. Many clients wanted to erase the appearance of aging by matching their gray to their natural color and only 2% of the population naturally has red hair. Henna by itself was seen as limiting, as red hair was often culturally distained.

Table for Henna-Rastik Compound Henna Formulation²²

| | Light Brown | Brown | Dark Brown | Black |
|-----------------|-------------|-------|------------|-------|
| Henna powder | 100 | 100 | 100 | 100 |
| Pyrogallol | 5 | 4 | 10 | 15 |
| Copper Sulphate | 5 | 7 | 8 | 10 |
| Sienna | 5 | 5 | 10 | 10 |
| Lampblack | nil | 2 | 5 | 20 |

The purpose of the sienna (an earth pigment containing iron oxide and manganese oxide) and lampblack (charred organic materials such as wood or bone) were to make the powder appear similar to the color of the expected dye results. Neither earth pigment nor char actually dyed the hair.

²⁰Redgrove, H. S., Foan, G. A., Woolss, J. B., (1939). *Hair-Dyes and Hair-Dyeing Chemistry and Technique. A new edition completely revised by H.S. Redgrove and J. Bari-Woolss, etc.* William Heinemann. (Medical Books LTD. London p. 78

²¹ Gastou, Dr. Paul. (1923) *Formulaire cosmetique et esthique* Second Edition, Paris.

²² Redgrove, H. S., Foan, G. A., Woolss, J. B., (1939). *Hair-Dyes and Hair-Dyeing Chemistry and Technique. A new edition completely revised by H.S. Redgrove and J. Bari-Woolss, etc.* William Heinemann. (Medical Books LTD. London p.79



Postcard of hair dye, early 20th century.

Scientists and physicians debated the dangerousness of copper and pyrogallol in henna-rasticks. Henna was harmless but took time to prepare and apply. Safety took second place to consumer demand and profitability. Oscar Levin MD was particularly damning of pyrogallol and copper.²³ He noted that the presentation of copper poisoning from hair dye was similar to that of workers from copper refineries whose hair turned greenish black from long exposure.

“The toxic effects of copper (Industrial poisoning) are not felt only by factory workers, however. The society matron who turns enthusiastically to “a wonderful dye” that somebody or other recommends to her shows exactly the same effects, when the dye is one of the copper sulphate preparations.

Levin continues to describe a typical case of dermatitis from exposure to copper. The subject had been using a copper henna-rastick every other month for three years. The dermatitis developed after extended exposure, progressing to a swollen and oozing scalp. Her hair was dyed black, but was damaged and brittle. He also reported evidence of hair dye causing lead poisoning from lead sulphide in compound henna hair dye, antimony poisoning, bismuth, tin, and cobalt poisoning. He stated that iron was less harmful in compound henna, but was infrequently used as a dye because the color faded. When iron was used in conjunction with cyanide in hair dye, it was more effective as a colorant, but poisonous.²⁴ Levin regarded all of the henna compounds and henna-rasticks as potentially harmful to health. He unequivocally recommended pure henna as hair dye. Schuller regarded henna-rasticks as safe if the pyrogallol and metallic salts were less than 10% of the total weight.²⁵

²³ “Shall I Dye My Hair? The Question that Woman Soon or Late, Answered by a Distinguished Physician, Oscar Levin, MD” (February 1928). *Good housekeeping*: Volume 86, Number 2. p.154

²⁴ *Ibid*, p. 156

²⁵ Schueller, E. (1910) *De l'innocuité des teintures pour cheveux*, Paris.

Hair Dyes Other than Henna, Henna-Reng, Rastiks, and Liquid Rastiks at the Beginning of the Twentieth Century



“Keeping It Dark” copyright 1907 by The Rotograph, NY²⁶

Henna was understood, popular, and recommended as safe at the beginning of the 20th century. Rastiks and henna-rastiks were generally less safe, but were suitable for brunette and black hair dye. The following information is from Ella Adelia Fletcher’s “The Woman Beautiful,” published in 1899.²⁷ This book presents in great detail the chemicals used in hair dye in the late 19th century, the harmfulness of the metallic salt hair dye formulas, and the relative safety and effectiveness of henna.

“Almost none of the (hair) dyes in common use are harmless. Most of the magic mixtures so extensively advertised and so highly extolled are compounded of deadly and most insidious poisons, that oftener than not ruin the hair, and inflict irreparable injury to the whole system. The secrets of these I shall disclose; giving also formula for the least

²⁶ Personal collection, Catherine Cartwright-Jones PhD

²⁷ Fletcher, E. A. (1899) *The Woman Beautiful, A practical treatise on the development and preservation of woman's health and beauty and the principles of taste in dress* by Ella Adelia Fletcher, W. M Young and Co. Publishers NY, p. 288

harmful dyes which are unfortunately much less used; and urging that if something of the sort must be resorted to, it will be chosen from the latter.²⁸

The following insoluble sulphides were found in 1939 in metallic hair dyes;²⁹ they have been included in compound henna products until present, though generally undeclared.

| Sulphide | Formula | Color |
|-------------------------|--------------------------------|----------------|
| Bismuth sulphide | Bi ₂ S ₃ | Brownish black |
| Cadmium sulphide | CdS | Yellow |
| Cobalt sulphide | CoS | Black |
| Copper sulphide | CuS | Brownish black |
| Ferrous (iron) sulphide | FeS | Black |
| Lead sulphide | PbS | Black |
| Mercuric sulphide | HgS | Black |
| Nickel sulphide | NiS | Black |
| Silver sulphide | Ag ₂ S | Black |
| Stannic (tin) sulphide | SnS ₂ | Yellow |

In France, the *Comité consultatif d'hygiène* forbid metallic components of antimony, bismuth, cadmium, mercury and lead in hair dye, though the highly toxic compounds of silver, chromium, cobalt, copper, iron, manganese, and nickel were permitted. In New York City, the use of metallic antimony, arsenic, chromium and mercury compound dyes for hair was prohibited by the 1930's.³⁰ These compounds are still found in henna today, and are responsible for the "henna ruins your hair" attitude held by most hairdressers.

Consistent with the range of hazardous but popular early hair dyes detailed by Fletcher,³¹ W. Seeger's Hair Dye No. 4 consisted of two fluids. The first contained 20 Cc of a blackish brown mixture of pyrogallic acid and iron chloride: the second 12 Cc ammoniated 12 per cent silver nitrate. W. Seeger's Improved Hair dye, No 3b is put up in 25 Cc flasks, containing a strongly acid dark brown stain. The solution consisted of water, alcohol, ether, pyrogallic acid, hydrochloric acid and iron.³² Potentially combustible, irritating to skin, and anesthetic, Seeger's Hair Dye No. 4 was a widely sold and typical formula for hair dye other than henna.

²⁸ Fletcher, E. A. (1899) *The Woman Beautiful, A practical treatise on the development and preservation of woman's health and beauty and the principles of taste in dress by Ella Adelia Fletcher*, W. M Young and Co. Publishers NY, p. 288

²⁹ Redgrove, H. S., Foan, G. A., Woolss, J. B., (1939) *Hair-Dyes and Hair-Dyeing Chemistry and Technique. A new edition completely revised by H.S. Redgrove and J. Bari-Woolss, etc.* William Heinemann. (Medical Books LTD. London p. 52

³⁰ Redgrove, H. S., Foan, G. A., Woolss, J. B., (1939) *Hair-Dyes and Hair-Dyeing Chemistry and Technique. A new edition completely revised by H.S. Redgrove and J. Bari-Woolss, etc.* William Heinemann. Medical Books LTD. London p. 52

³¹ Ibid. pp. 288-92

³² *Drug Topics*, Volumes 23-24, p. 297



W. Seeger's hair dye, London, UK, approximately 1920³³

“The Woman Beautiful, A practical treatise on the development and preservation of woman's health and beauty and the principles of taste in dress by Ella Adelia Fletcher”

Ella Adelia Fletcher's work shows clearly that the health concerns of hair dye at the turn of the 20th century were well understood, linked to industrial modernity, and that the dangers were ignored for the sake of profit and fashion.³⁴

“From the Orient comes the baleful custom of dyeing and bleaching the hair simply to change its color as you would that of your gown. In the harems of Persia and Turkey, where the women have few interests to occupy their minds, it is a chief amusement to dye the hair; and when the blonde colors hers black the brunette bleaches hers to a reddish gold. They even dye the hair of infants two or three years old. But why the emancipated women of the Western nations should ever have given even a transient vogue to the custom, it is impossible for either common sense or artistic taste to discover.

“The craze has already wrought its ultimate extinction, for it has ruined many beautiful heads of hair. To many a girl, Ovid's rebuke to the Roman woman so long ago would apply: “Your own hand has been the cause of the loss you now mourn, for you poured the poison upon your own head.”

³³ Catherine Cartwright-Jones PhD image collection

³⁴ Fletcher, E. A. (1899) *The Woman Beautiful, A practical treatise on the development and preservation of woman's health and beauty and the principles of taste in dress* by Ella Adelia Fletcher W. M Young and Co. Publishers NY, p. 288-292

“In most of the proprietary hair-dyes the principal chemicals employed, nitrate of silver and lead, possess great disadvantages; the first staining the skin badly, and injuring the texture of the hair, and the latter being ‘an active poison, liable to cause painful colic, and even contraction of the limbs.

“This is one of the standard preparations:

M. PIESSE’S HAIR DYE

Nitrate of silver 28 grammes
Rose-water. 225 grammes

“Dissolve: when diluted with an equal part of distilled water, it dyes deep brown or chestnut; with twice its bulk, light brown; and undiluted, complete black, though the shade of hair modifies the effect somewhat. When using this, the adjacent skin should be washed with a solution of chloride of sodium to prevent discoloration. The hair must be cleansed entirely from oil by an alkaline shampoo; if allowed to dry first it will take the color better. After moistening with the solution, expose the hair to light. Sunlight will set the color in a few minutes; but in diffused daylight it may take several hours; therefore, if time is of importance a “mordant” must be applied, and commonly an application of this second solution follows the nitre:

Sulphuret of potassium 1%drachms
Distilled water 2 ounces

“This “sets” the color immediately. It will aid somewhat to prevent staining the skin if the “mordant” be applied first; following it in a few minutes with the dye, but the color thus produced is not so permanent. The dye is best applied with a brush; and it is hardly necessary to add that it is a difficult task for a woman to do it for herself. To avoid staining the hands, gloves should be worn; the solution of potassium will remove the stain if applied immediately. As the dye is extremely caustic, rendering the hair dull and brittle, it is necessary to anoint the scalp and hair once or twice a week with some unguent.

“Hyposulphite of soda will color the hair black provided it contains sufficient sulphur to combine with it and it has the advantage of not staining.

BROWN HAIR DYE

Pyrogallic acid I drachm
Eau de Cologne 2 drachms
Rose-water 5 ounces

“This is similar to a lotion already given “to darken patches of gray hair,” and the directions therewith should be observed.

“Note specially that the shades obtained by preparations of iron and bismuth range from dark brown to black; those by nitrate of silver, from a rich chestnut to deep brown and black; from pyrogallic acid and walnut-juice, various shades of brown, the first warmer in tone; and from lead, varying shades from reddish-brown and auburn to black. The lead shades when the dye is badly compounded or unskillfully applied are extremely ugly.

“More as a warning than for information, I will mention that the daily use of oil or pomatum with which a few grains of carbonate of lead, lead-plaster, or tri-nitrate of bismuth, have been blended by heat and careful trituration, will gradually darken the hair. Its long-continued use, however, is perilous, being liable to cause atrophy of the scalp and consequent baldness; and sometimes even local paralysis.

“The lead dyes composed of litharge and lime are also extremely injurious, besides being inconvenient. They are sold in the form of a white powder to be made into a paste, when used, with warm water (for black) or milk (brown); and to be applied with a brush or rubbed in with the fingers. The operation is extremely tedious, and in some of the much vaunted compounds—as “Dr. Hanmann’s”—the proportion of quicklime is so large that it often damages the roots of the hair, and even acts as a depilatory; for which purpose it might much better be reserved.”³⁵

Fletcher understood that henna and indigo were very reliable and extremely safe. The preferred henna application was referred to as a “cataplasm,” a henna paste left in hair for several hours. There was an alternate use as a temporary rinse of boiled henna leaves applied after a shampoo. Pure henna (which is presently referred to as body art quality henna) and vashma indigo were considered by many to be the only entirely safe and reliable hair dye. After thirty years of henna product adulteration and subsequent injuries, and the general subsuming of all hair dyes under the term “henna,” Dr. Oscar Levin attempted to address the confusion again to the general public, thirty years later, about the genuinely dangerous products on the market in an article in “Good Housekeeping” in 1928.³⁶

Excerpts from “Shall I Dye My Hair? The Question that Woman Soon or Late, Answered by a Distinguished Physician, Oscar Levin MD.”³⁷

“For it is known to every scientist who has examined into the general subject of hair dyes that so far, with only one exception, there is not one hair dye that is both effective as a dye and non-injurious to the health. The exception, unfortunately, is of limited value because it can be used only by those men and women who wish to dye their hair to a reddish tone. The exception is henna, about which more will be said later in this article.

³⁵ Excerpted from Fletcher, E. A. (1899) *The Woman Beautiful, A practical treatise on the development and preservation of woman’s health and beauty and the principles of taste in dress* by Ella Adelia Fletcher W. M Young and Co. Publishers NY, p. 288-292:

³⁶ “Shall I Dye My Hair? The Question that Woman Soon or Late, Answered by a Distinguished Physician, Oscar Levin, MD” (February 1928). *Good housekeeping*: Volume 86, Number 2. Curated online by Albert R. Mann Library. 2014. Home Economics Archive: Research, Tradition and History (HEARTH). Ithaca, NY: Albert R. Mann Library, Cornell University. <http://dlxs2.library.cornell.edu>.

³⁷ “Shall I Dye My Hair? The Question that Woman Soon or Late, Answered by a Distinguished Physician, Oscar Levin, MD” (February 1928). *Good housekeeping*: Volume 86, Number 2. curated by Albert R. Mann Library.

“It may seem a sweeping statement to say that there is not one single dye known today (other than henna) which combine effectiveness with harmlessness, yet it is literally so.³⁸ “The result was that an amendment to the Sanitary Code of the city was passed, in 1926, prohibiting the use of noxious hair dyes and cosmetics. ... (but) beauty shops continue to sell and use them with the possibility of pain and illness or not.

“Most of the dyes which these manufacturers supply ... are of two classes. The first is the metallic dye, and the second is the synthetic dye.

“The metallic dyes, though it sounds like a paradox to say so, are less vicious because they are the more dangerous. I mean that it is so generally known that metallic dyes are harmful that they are not so readily accepted as the other group. Yet in spite of the greater understanding of the dangers of using dyes with a metallic base, the huge numbers of cases of poisoning which come to physicians, clinics, hospitals, year after year, show that there still is need for widespread educational work even about these.³⁹



Postcard from early 20th century demonstrating that all hair dyes were conflated with as henna in the popular imagination, whether or not there was any henna in the dye.⁴⁰

³⁸ Ibid, p.24

³⁹ Ibid, p. 25

⁴⁰ Image collection of Catherine Cartwright-Jones, PhD



Early 20th century pure henna hair dye products often referenced Egypt or listed Egypt as the source of the henna.⁴¹

After reviewing the destructiveness of hair dyes based on metallic salts, lead, silver nitrate, arsenic, copper salts and solvents, Fletcher gave details of how to prepare henna as hair dye.⁴² The methods she reported of working with pure henna are similar to that used today. Her work proves that in 1899, in the USA, henna and indigo were understood to be safe and effective hair dyes, the acidic hydrolysis necessary for henna dye release was understood, and the application method was understood. Fletcher considered henna to be the best and least harmful hair dye.

“In the orient the black sulphurets of lead and antimony, and the oxides of iron are occasionally used for coloring the hair the glossy, midnight black there so highly esteemed, but the favorite medium, and much the best one, is the famous henna, a preparation of *Lawsonia inermis*. Sometimes it is combined with powdered gall-nuts, mixed in a paste, and is followed by another paste of iron pyrites which the Armenians obtain in their mountains, and which from being a favorite stain for the eyelashes has received the name *rastikopetra*.”⁴³

“The popular method in Persia is to apply a paste of the henna powder all over the hair from' the tips to the roots. It is left on for a half-hour or longer—according to the natural color of hair—and then washed off, when the hair will be found to be dark red; following this a paste of indigo is applied which is left on from an hour and a half to three hours.

⁴¹ Dr. Catherine Cartwright-Jones’s collection of vintage henna hair dye.

⁴² Fletcher, E. A. (1899) *The Woman Beautiful, A practical treatise on the development and preservation of woman’s health and beauty and the principles of taste in dress* by Ella Adelia Fletcher, W. M Young and Co. Publishers NY, p. 288-292

⁴³ Fletcher, E. A. (1899) *The Woman Beautiful, A practical treatise on the development and preservation of woman’s health and beauty and the principles of taste in dress* by Ella Adelia Fletcher, W. M Young and Co. Publishers NY. P. 292

After the indigo paste is washed off, the hair is well oiled; and the jetty blackness resulting from the operation is unequalled, while the process is probably the least dangerous of all hair dyes. The henna paste is made by reducing the dried leaves to a coarse powder and mixing with hot water; and when it alone is used on white hair it turns it to a fine golden red.

“Another method is to mix one part of henna into a paste with three parts of indigo and apply. The longer it remains the darker the color; it is said to produce a clear brown in one hour. Where the skin has been colored by the operation it can be washed clean with soap and water, without affecting the color of the hair, which is retained for a long time.

The coveted Titian red, much affected by Oriental women, is produced by them in the following way, probably the least injurious method of obtaining it:

THE COVETED TITIAN LOCKS ORIENTAL HENNA PASTE⁴⁴

Powdered henna 1/4 pound
Acetic acid 4 drachms
White honey 4 drachms
Powdered rhubarb 4 drachms
Hot water, sufficient to form a paste.

“It is applied as directed for the foregoing, and the long ends of hair are fastened in strands upon the head after it has been thoroughly covered with the paste, the remainder of which is plastered overall and left for two hours to dry. It is then washed off in several waters softened with ammonia or soda. When the hair is dried in the sun—and the women sit on the house-tops for that purpose — it becomes a mass of ruddy gold. Gloves should be used upon the hands or else they should be smeared with Vaseline during this operation.”

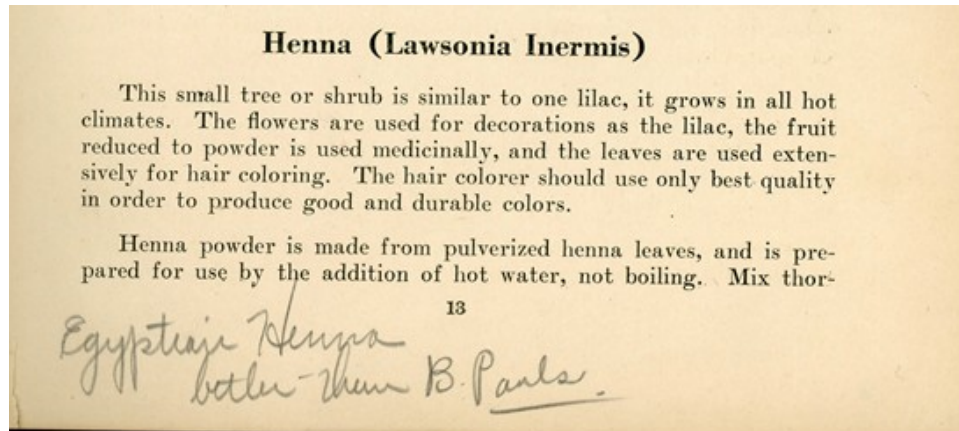
Nearly thirty years after Fletcher provided information on the safety of henna and detailed the method of application, Levin attempted to refresh women’s memory of henna in response to the rising injuries from chemical adulterants in hair dyes.⁴⁵

“Vegetable dyes are utterly harmless, an irony because, with one exception, the dyes in this group are unstable and impractical from the commercial standpoint. These dyes are prepared from herbs, plants and certain nut shells. The only dye in this group, however, which is used to a considerable extent, is henna.

⁴⁴ Fletcher, E. A. (1899) *The Woman Beautiful, A practical treatise on the development and preservation of woman’s health and beauty and the principles of taste in dress* by Ella Adelia Fletcher W. M Young and Co. Publishers NY. P. 293

⁴⁵ “Shall I Dye My Hair? The Question that Woman Soon or Late, Answered by a Distinguished Physician, Oscar Levin, MD” (February 1928). *Good housekeeping*: Volume 86, Number 2. p.161

“Henna is a paste made from the leaves of a plant found in India, Persia, Africa, and Arabia. The dried leaves of the plant are made into a powder and mixed with water to form the paste. It was long used by Orientals as a dye for the skin of the face and hands, as well as the hair.”



Note hand written by student in “Rohrer’s Illustrated Book on Scientific Modern Beauty Culture of Hair-dyeing, Bleaching, Henna, Care of the Hair and Scalp, Facial Massage, Beautifying, Electrolysis, Manicuring, Etc.”⁴⁶ indicates the superiority of pure Egyptian henna to B. Paul’s Compound Henna.



B. Paul’s Compound Henna, lid⁴⁷

⁴⁶ Rohrer, J, (1924) published by Prof. Rohrer’s Institute of Beauty Culture, New York City, NY., P. 13

⁴⁷ Private collection of Catherine Cartwright-Jones PhD

B. Paul's Henna and B. Paul's Henna Compounds

B. PAUL'S
Wonder Herb Hair Coloring
IMPOSSIBLE TO EQUAL

B. PAUL'S HENNA, the "Wonder Herb," is now the recognized standard of the world—absolutely safe and of proven excellence by millions of women. You are thus assured of absolutely satisfying results—THEN.

Why Have Gray or Faded Hair, Use B. PAUL'S HENNA

Discriminating women the world over demand and use B. PAUL'S HENNA because of its genuinely natural coloring and supreme excellence. The best and most absolutely natural coloring known. The ease with which it restores the color to gray hair, invariably producing beautifully natural, lasting results, always uniform, is a delightful revelation and lasting satisfaction to fastidious women and essential to smart appearance.

To Get the **GENUINE Say** and Insist on getting **B. PAUL'S HENNA**

B. PAUL'S HENNA
DARK BROWN
COPYRIGHT
The WONDER HERB
Nature's Hair Restorer
PREPARED BY
B. PAUL
NEW YORK

THE TRUTH ABOUT HENNA The Wonder Herb, introduced by us—Remember nothing equals genuine Henna. How for restoring lost color to gray or faded hair. Youthful, lustrous gloss and softness return to the hair with the use of B. PAUL'S HENNA, unaffected by shampooing, oils or hair toner; the color becoming more beautiful by frequent shampooing. Once you try genuine B. PAUL'S HENNA you will never be satisfied with a substitute. B. PAUL'S HENNA is a perfect preparation prepared by B. Paul, Premier French Hair Color- ing Specialist of the World. B. PAUL'S HENNA is composed of Henna and Herbs, prepared in fourteen different shades, so that you can obtain the exact shade to match natural color of your hair. Wonderfully simple to use, absolutely safe, will not stain scalp or skin.

TAKES YEARS OFF YOUR AGE Gray Hair is a great handicap in society or business—it makes you feel and appear older than you are. It impairs the charm of a beautiful face and is always a constant source of embarrassment to sensitive women of refinement. Do not hesitate to use B. PAUL'S HENNA—but be sure that the name—B. PAUL'S HENNA—is on the CAN.

B. PAUL, 21 West 39th St., New York
HAIR COLORING SPECIALIST
FOR SALE BY ALL DRUG AND DEPARTMENT STORES

Text of above advertisement for B. Paul's "Dark Brown Henna," a compound henna which included pyrogallol and metallic salts.

"B. PAUL'S
Wonder Herb Hair Coloring
IMPOSSIBLE TO EQUAL

"B. PAUL'S HENNA, the "Wonder Herb," is now the recognized standard of the world – absolutely safe and of proven excellence by millions of women. You are thus assured of absolutely satisfying results – THEN.

"Why Have Gray or Faded Hair, Use
B. PAUL'S HENNA

"Discriminating women the world over demand and use B. PAUL'S HENNA because of its genuinely natural coloring and supreme excellence. The best and most absolutely natural coloring known. The ease with which it restores the color to gray hair, invariably producing beautifully natural, lasting results, always uniform, is a delightful revelation and lasting satisfaction to fastidious women and essential to smart appearance.

To Get the GENUINE Say and Insist on getting B. PAUL'S HENNA

“THE TRUTH ABOUT HENNA The wonder Herb introduced by us – Remember nothing equals genuine Henna Herb for restoring lost color to gray or faded hair. Youthful, lustrous gloss and softness return to the hair with the use of B. PAUL’S HENNA, unaffected by shampooing, oils, or hair tonic; the color becoming more beautiful by frequent shampooing.

“Once you try genuine B. PAUL’S HENNA you will never be satisfied with a substitute. B. PAUL’S HENNA is a perfect preparation prepared by B. Paul, Premier French Hair Coloring Specialist of the world.

“B. PAUL’S HENNA is composed of Henna and Herbs, prepared in fourteen different shades, so that you can obtain the exact shade to match natural color of your hair. Wonderfully simple to use, absolutely safe, will not stain or rub off.

“TAKES YEARS OFF YOUR AGE

“Gray Hair is a great handicap in society or business – it makes you feel and appear older than you are. It impairs the charm of a beautiful face and is always a constant source of embarrassment to sensitive women of refinement. Do not hesitate to use B. PAUL’S HENNA – but be sure that the name B. PAUL’S HENNA – is on the can.”



B. Paul’s Compound, listing Metallic Salts and Pyrogallol in the ingredient declaration⁴⁸
In 1913, F. L Lebeau Inc. was made the sole distributor in the United States for a French hair dye, L’Oreal Henne, imported from France and resold in the USA until 1918. Soon after, import from France was complicated by the First World War, and Labeau obtained the formula from the

⁴⁸ Private collection of Catherine Cartwright-Jones PhD

manufacturer of L’Oreal Henne, along with the exclusive right to manufacture the product in the USA, and to use similar packaging.

Henna D’Oreal claimed that their product was a new French discovery providing the only harmless coloring in the world. The counterclaim was that henna was not a new discovery, was not manufactured in France, and did not differ from numerous henna hair dyes which had been for sale and were in general use. Henna D’Oreal was required to change their misleading name and claims, and continued to produce henna and compound hennas under the name B. Paul’s Henna, and B. Paul’s Compound.⁴⁹



B. Paul’s Henna Compound and B. Paul’s Compound Coloring products, showing fourteen shades of dye color and no ingredient declaration.⁵⁰

Compound Henna

Descriptions of henna in the early 20th century indicate that products sold as henna in Europe, the UK, and the USA already contained undeclared ingredients. “Henna, for instance, which is sometimes very treacherous, dyes the hair a dull green or hideous violet instead of the golden

⁴⁹ The American Perfumer and Essential Oil Review Vol XVI March 1921 – February 1922, Perfumer Publishing Company, New York. P. 156

⁵⁰ Private Collection of Catherine Cartwright-Jones Phd

hue s much desired by women,”⁵¹ clearly indicates that the product assumed to be henna was not actually henna. Something else caused the “dull green or hideous violet.”

Oscar Levin MD, writing in 1928, had a low regard for the marketing of compound henna dyes which caused confusion and negative health consequences and attempted to warn women off the use of compound henna:

“A woman who has black hair which is beginning to turn gray will naturally wish to preserve or duplicate the color of hair by which she is known to her friends.

“In an effort to obtain different shades, using the henna as a base, the compound hennas have been placed on the market. These may produce a brown or black color. However, they are not safe, for in adding substances to the henna paste in order to obtain the new shade, metals and pyrogallic acid must be used, and that takes us back to the beginning (referring to the previous discussion of the health hazards from metallic salt). Besides, the use of the words "brown henna" and "black henna" is very misleading, since the buyer believes he is purchasing a non-dangerous, unpolluted vegetable dye, when as a matter of fact (s)he is really buying a potentially dangerous metallic dye.”⁵²

The “Blonde henna” described by Merck’s Report⁵³ contained 0.5% picric acid, $O_2N)_3C_6H_2OH$.⁵⁴ Picric acid is yellow, and improves the color of acid-staining dyes, such as henna, but is explosive. Dunnite, the ammonium salt of picric acid, is as powerful as TNT, but less stable. The amount of henna in this product was estimated at less than one half of one percent.

In the 1920 Merck’s report, a professional journal for pharmacists listed the metallic salts used with henna and indigo to create a commercially available pre-mixed range of colored henna hair dye products compound henna.⁵⁵ $NiCl_2$: nickel chloride, was used in textile dyes as well as henna, but can cause contact dermatitis.⁵⁶ $FeSO_4$: iron sulphate, used as a dye fixative and to blacken leather.⁵⁷ $CuSO_4$: copper sulphate is used as a mordant in dyeing.⁵⁸ $SnCl_2$, tin(II) chloride, also known as stannous chloride, used as a mordant in dyes to make colors more bright. The Volume 29 edition of the Merck’s⁵⁹ report describes compound henna consistent with a container of B. Paul’s compound henna, with separated layers of metallic salts, sumac, and a

⁵¹ “Merck’s Report, A Practical Journal of pharmacy as a Profession and a Business,” December 1907, Volume 16, “Green, blue, and magenta hair” page 291

⁵² Shall I Dye My Hair? The Question that Woman Soon or Late, Answered by a Distinguished Physician, Oscar Levin, MD” (February 1928). *Good housekeeping*: Volume 86, Number 2. p.61

⁵³ Hoffstein, B. December 1920 “Notes on Henna,” *Merck’s Report, A Practical Journal of Pharmacy as a Profession and a Business*, Volume 29, Published by Merck & Co. New York, page 141

⁵⁴ https://en.wikipedia.org/wiki/Picric_acid

⁵⁵ Hoffstein, B. December 1920 “Notes on Henna,” *Merck’s Report, A Practical Journal of Pharmacy as a Profession and a Business*, Theodore Weicker Ed., Volume 29, Published by Merck & Co. New York, page 141

⁵⁶ [https://en.wikipedia.org/wiki/Nickel\(II\)_chloride](https://en.wikipedia.org/wiki/Nickel(II)_chloride)

⁵⁷ [https://en.wikipedia.org/wiki/Iron\(II\)_sulfate](https://en.wikipedia.org/wiki/Iron(II)_sulfate)

⁵⁸ [https://en.wikipedia.org/wiki/Copper\(II\)_sulfate](https://en.wikipedia.org/wiki/Copper(II)_sulfate)

⁵⁹ Hoffstein, B. December 1920 “Notes on Henna,” *Merck’s Report, A Practical Journal of Pharmacy as a Profession and a Business*, Volume 29, Theodore Weicker, Ed. Published by Merck & Co. New York, page 141

small amount of henna.⁶⁰ The metallic salts FeSO_4 , CuSO_4 , in the container were up to 50% of henna and sumac mixture; the sumac would have provided gallic acid and tannins.



B. Paul's Compound with metallic salts for changing the natural color of henna
The metallic salts were separated from the henna by the instruction paper.

Products labeled as henna available in numerous colors sold through the rest of the 20th century, and into the 21st century should be assumed to be compound hennas of one sort or another. The ingredient declaration for compound henna was usually absent on the packaging.

⁶⁰ <https://en.wikipedia.org/wiki/Sumac>

Is it pure henna, henna-rastik, henna-reng, compound henna, or progressive dye?

It can be remarkably difficult to ascertain whether a product labeled ‘henna’ actually contains pure henna or henna adulterated with metallic salts and synthetic dyes. The ingredient declaration may not appear on the package, or if it does, it may be very difficult to read.



Henna powder products containing sodium picramate, Henné Color Paris, package, contents, and insert.

Ingredient declaration for product group:

Aqua (Water), Cetearyl Alcohol, Propylene Glycol, Cetearth-33, Benzyl Alcohol, Cocamidopropyl *Betaine*, *Basic Brown 17*, Acrylamide/Sodium Acryloyldimethyltaurate Copolymer , *Basic Blue 99*, *Basic Brown 16*, Isohexadecane, Lavandula Hybrida Oil, Glycerin, Cetrimonium Chloride, *Basic Yellow 57*, Quaternium-52, Peg-15 Cocopolyamine, Sodium Chloride, Polysorbate 80, Linalool, Sodium Picramate, *Magnesium Nitrate*, Lawsonia Inermis (Henna) Leaf Extract, *Magnesium Chloride*, Methylchloroisothiazolinone, Sodium Benzoate, *Potassium Sorbate*, Citric Acid, Methylisothiazolinone.

It may be assumed that any given Henné Color product contains, some, but not all of the group ingredient declaration; the product group of nine henna colors as a whole would contain all of the metallic salts and synthetic dyes (italicized) listed. The “henna colors” include Blond Dore (blonde), Neutre (neutral), Auburn (auburn), Châtain (dark blonde), Acajou (mahogany), Brun (brunette), Noir (black), Quinquina (dark red), and Cuivre (copper). Henna, *lawsonia inermis*, only comes in one color. The variants in this compound henna product are all created with synthetic dyes and metallic salts



Henné Color Paris: folded box dimensions 14 cm (5.5”) high x 9 cm (3.5”) wide⁶¹

The Henné Color Paris package, above, has large labels stating that the product is henna (*A base de HENNÉ Naturel* in the pink circle), and does not contain ammonia, peroxide, or para-phenylenediamine. The label on the bottom of the package, enlarged below, states that there is sodium picramate⁶² in the formula. A person purchasing this product would be unlikely to notice

⁶¹ Purchased January, 2018, from Wingate Health Ltd, 59 Northey Avenue, South Cheam, Surrey. SM2 7HU, UK

⁶² Sodium Picramate is used to intensify vivid red henna colors.

http://www.chemicalbook.com/ProductChemicalPropertiesCB7327692_EN.htm

Picramic Acid, 2,4-Dinitro-6-aminophenol, is a toxic, explosive, highly oxidative dark red crystalline solid with bitter taste; soluble in water, alcohol, chloroform, acetic acid and most organic solvents; melts at 169 C; derived from phenol through nitration reaction or from chlorobenzene. Picramic acid itself as well as its metallic salts are highly explosive. It can be used in pyrotechnics and rocket fuel. It should be transported with 25-35% water. In addition to pyrotechnic application, picramic acid and its salts are used to make dyes

or remember that there is sodium picramate, which can have a destructive cross-reaction with oxidative dyes.



Sodium picramate is listed only on the bottom of the box, in letters 2 mm high. Box base is 9 cm (3.5”) wide; ingredient lettering 2 mm (0.0787402”) high.



The Noir (black) Henné Color ingredient declaration also includes metallic salts and chemical dyes: magnesium nitrate, magnesium chloride, Basic blue 99, Basic Brown 16, Basic Yellow 57, Basic Red 76, and Acid Violet 43.



Japp's Egyptian Henna, Cincinnati Ohio, 1918. This might be an example of unadulterated henna, based on the fact that it only claimed to add an auburn tone to hair, was applied as a paste and required a prolonged application, but there is no ingredient declaration.

(acid, chrome), insecticides and as a colorimetric reagent to determine albumin.

Label text: Japp's Egyptian Henna for tinting the hair beautiful auburn shades. Directions: After washing the hair thoroughly. Make a thick paste by mixing the henna with hot water. Divide the hair into strands and anoint freely with the paste. The hair should be kept in contact with the henna paste for thirty minutes to an hour and a half, depending on the degree of red desired. Rinse the hair well with lukewarm water. For henna rinse, dissolve six tablespoons of henna in one gallon of hot water and pour over hair after shampooing.

Test hair to see whether the henna that has been used to dye hair contained metallic salts.

This testing protocol is from Standard Textbook of Cosmetology, 1985.⁶³

- 1) In a glass container, mix one ounce (30 ml) of 20 volume peroxide and 20 drops of 28% ammonia water.
- 2) Take a few strands of hair that has been dyed with a henna product of unknown purity. (Harvest hair from your hairbrush and dye it with the henna of unknown purity if you are not testing hair you have previously dyed.) Bind the hair with scotch tape and immerse the hair in this solution for 30 minutes.
- 3) Remove the hair from the glass container and observe for changes. Since most compound henna products contain salts of lead, silver, or copper, the most common reactions are as follow
 - a. Lead (often lead acetate): When you remove the hair from the solution, the hair will immediately change color in contact with the air, often turning lighter rapidly. Lead reacts with the cysteine of hair to form lead-sulfur complexes in the cuticle layers.
 - b. Silver: When you remove the hair from the solution, you will not see a reaction at the end of half an hour, but a peroxide and ammonia solution will not be able to lighten hair because it cannot penetrate the silver coating. If the silver was silver nitrate, there will be a greenish cast to your hair. If they green does not go away in three days, it is silver nitrate, and not the precursor indigene that has not yet converted to indigo.
 - c. Copper: The hair will begin to boil within a few minutes of being in the solution. The hair strands will feel hot and smell terrible. In a few minutes, the hair will fall apart completely.

Metallic Salts and the Consequences of Misbranded Compound henna

Compound henna hair dyes containing unlisted or obscurely declared metallic salts are the source of much of the misinformation about henna, and they are the reason that stylists malign henna. Hair dyed with a product containing metallic salts will be brittle, and the metallic salts will cross-react with the chemicals in per solution, lighteners, and oxidative hair dye.

⁶³ Rubenstein, I. ed. (1985 edition) *Standard Textbook of Cosmetology* American College of Cosmetology Raritan New Jersey, Page 183

The metallic salts were added to henna intended to fix the color, but properly used, henna, indigo, and cassia do not need metallic salts to set the color. Understanding the precursor and intermediate dye molecules, dye release time, and how these intermediate molecules bind to keratin eliminates the need for metallic salts. Either the manufacturers do not understand the chemistry of henna, or they think that the women who are their customers are not smart enough to understand the science. The understanding of the dye precursors and intermediates that make henna, indigo, and cassia form permanent bonds with your hair are in Ancient Sunrise® Chapter 5, Plants that Dye Hair,⁶⁴ and Chapter 7,⁶⁵ Mixing and Testing your Henna Mix.

If in doubt about the contents of a product labeled henna, use Ancient Sunrise® henna. Ancient Sunrise® is NOT compound henna, it is 100% pure body art quality henna, and may be used prior to, or subsequent to oxidative or metallic dyes without destructive cross-reactions.

⁶⁴ http://www.tapdancinglizard.com/AS_henna_for_hair/Chapter_5_Plants_that_Dye_Hair.pdf

⁶⁵ http://www.tapdancinglizard.com/AS_henna_for_hair/Chapter_7_Mixing_and_Testing.pdf

Ancient Sunrise® Henna for Hair Chapter 3, Compound Henna, Part 1.

Copyright © 2018 Catherine Cartwright-Jones

Cover Graphic by Alex Morgan

Published by TapDancing Lizard® LLC

339 Tallmadge Rd. Kent, Ohio, 44240

Terms of Service: Creative Commons: Attribution-NonCommercial-NoDerivs 3.0 Unported

You are free to **Share**, to copy and redistribute this material in any medium or format under the following terms. The licensor cannot revoke these freedoms **as long as you follow the license terms**.

Attribution - You must give [appropriate credit](#) and provide a link to the license. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

Non-Commercial - You may not use this material for [commercial purposes](#).

No-Derivatives - If you [remix, transform, or build upon](#) the material, you may not distribute the modified material in any form or by any means.

For further information on henna and hair, please visit www.hennaforhair.com

To purchase henna, please visit www.mehandi.com

HELP DESK AND ORDER DESK: call 330-673-0600 or toll-free 855-MEHANDI

Call 330-673-0615 for help with your relaxed or natural hair