

ANCIENT SUNRISE®

Compound Henna



Dark Auburn



Light Blond



Auburn



or Faded Ha

Light Auburn



**B. PAUL'S
HENA**

Light Brown
Light Chestnut



OUND

Reddish Blond



*ring
Hair*

Blond



Why have Gray or Faded Ha

**B. PAUL'S
HENNA**

COMPOUND

*For Coloring
Gray Hair*

Catherine Cartwright-Jones PhD

Compound henna

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.

Compound henna: Part 1

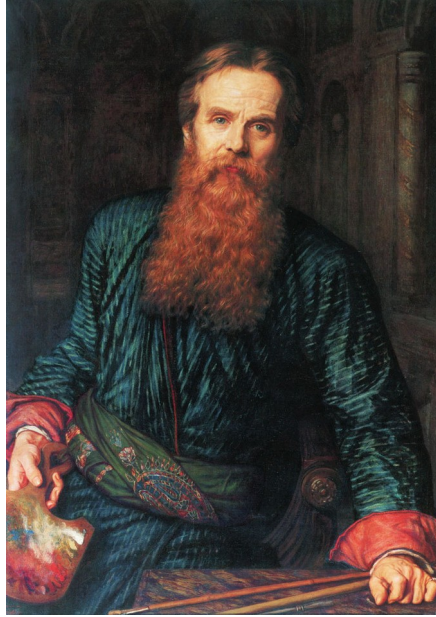
A Historical Perspective of Compound henna: Henna hair dye in United Kingdom and French marketplace in the nineteenth century



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.”

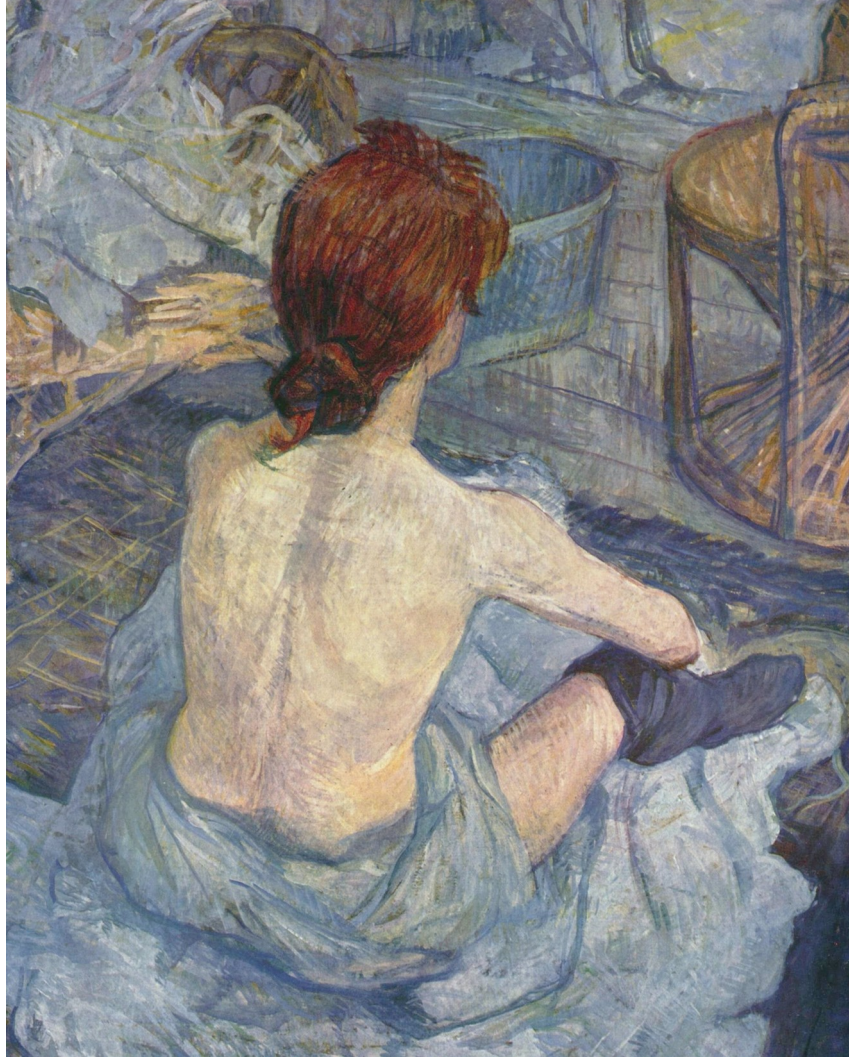
From “Lalla Rookh,” 1817, by Thomas Moore ⁵

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.



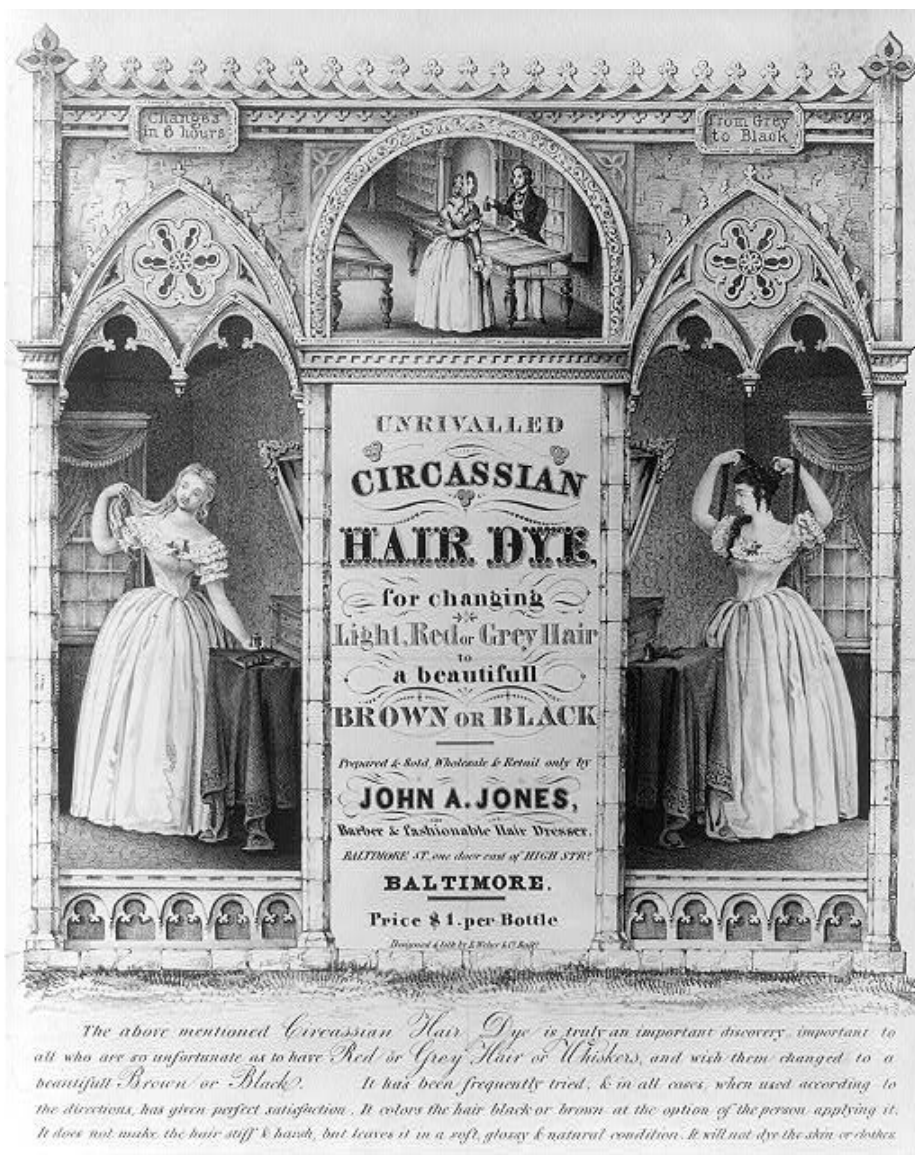
Brothel workers with hennaed hair by Henri de Toulouse-Lautrec, *Salon de la rue des Moulins*, 1894 – 5, Musée Toulouse-Lautrec, Albi, France

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

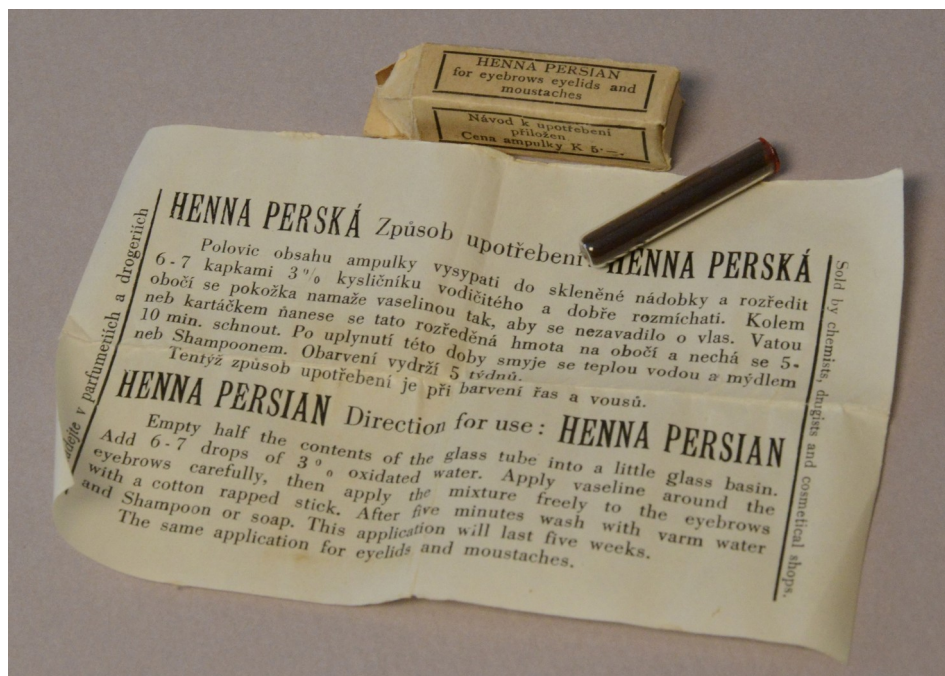
19th century London chemist and perfumer Septimus Piesse reported on Armenians in Constantinople formulating cosmetics, specifically a black hair dye based on rasticks.¹¹ In Armenia, pyrites, (FeS₂), were mined for rastik powdered cosmetic compounds and used throughout Persia for darkening eyebrows and 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

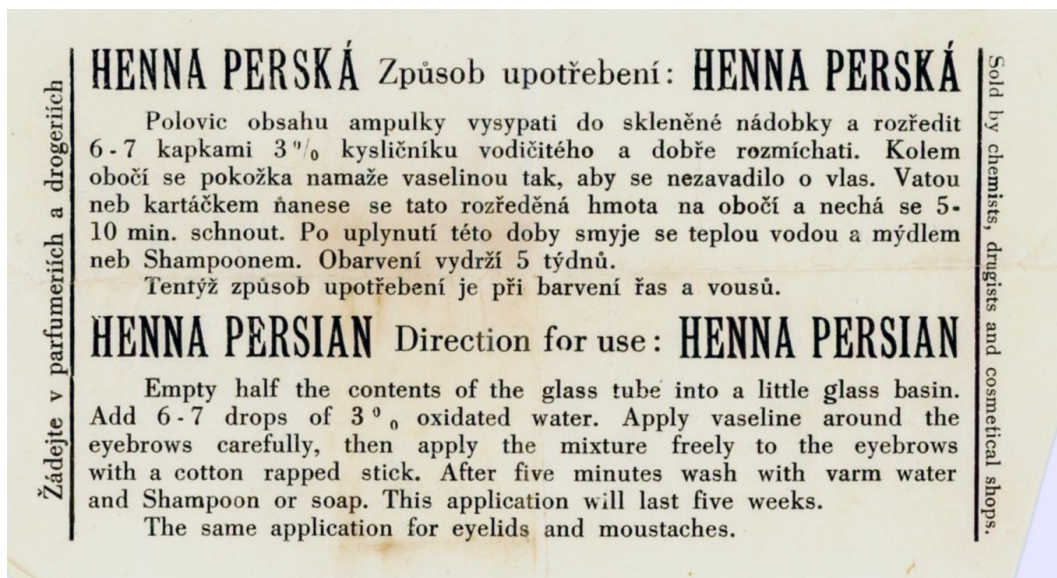
This was applied as a pack in hair and left for several hours, then washed out. The pyrogallol on the surface of the hair rapidly oxidized to a dark brown color. This rastick left the hair dull-looking and copper often causes contact dermatitis. When mixed with henna, the rastick metal compound was less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

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

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 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

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

similar to the color of the expected dye results. Neither earth pigment nor char actually dyed the hair.



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

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

hair dye. Schuller regarded henna-rastiks as safe if the pyrogallol and metallic salts were less than 10% of the total weight.²⁵

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.

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

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

“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 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_2S_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_2S	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 pyrogalllic 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, pyrogalllic 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 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.”

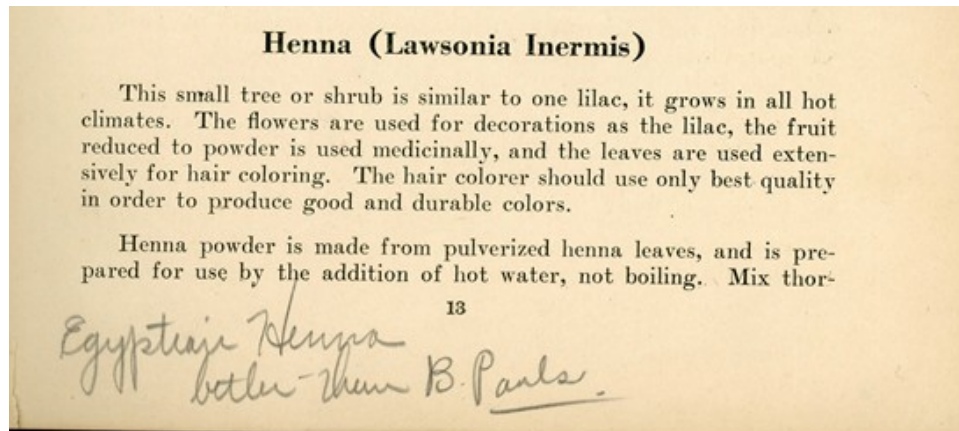
Nearly thirty years after Fletcher provided information on the safety of henna and detailed the method of application, Levin attempted to refresh women’s memory of henna in response to the rising injuries from chemical adulterants in hair dyes.⁴⁵

“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
B. PAUL'S HENNA
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—The 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.

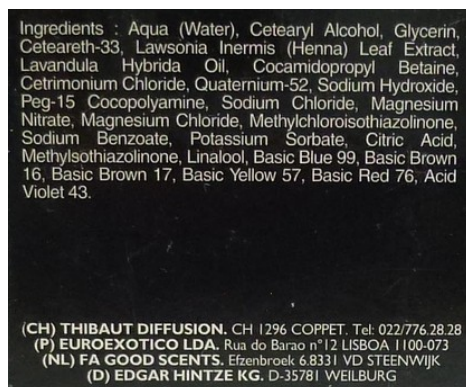
http://www.chemicalbook.com/ProductChemicalPropertiesCB7327692_EN.htm

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

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.

are used to make dyes (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

- In a glass container, mix one ounce (30 ml) of 20 volume peroxide and 20 drops of 28% ammonia water.
- 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.
- 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
 1. 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.
 2. 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.
 3. 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.

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

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

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.



Postcard of Buckingham's Dye for the Whiskers 1880- 1900, R.P. Hall & Company of Nashua, New Hampshire. This whisker dye was an ammoniacal solution of nitrate of silver, and consists of 4 gr. nitrate of silver, 2} gr. solution of ammonia, and 40 gr. distilled water (Dr Schacht).⁶⁶

The advertising copy implies that hennaed whiskers are inferior.

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

⁶⁶ Cooley, Arnold, J. North, W. (1892) Cooley's Cyclopaedia of practical receipts and collateral information in the arts, manufactures, professions, and trades, including medicine, pharmacy, and domestic economy designed as a comprehensive supplement to the pharmacopoeia and general book of reference for the manufacturer, tradesman, amateur, and heads of families.

Compound henna: Part 2

Henna Mislabeling, Misinformation, and Disinformation

In the early twentieth century the term “henna” was applied to many hair dyes, whether or not the dye was actually henna; the word henna conveyed “safe” and “effective” during a time when early chemical hair dyes were haphazard and often dangerous.



One Pound Hopkins' White Henna Compound (so called)
The Earth Contributes and J. L Hopkins & Co. Distributes Cosmetic Basic Materials
Manufactured only by J. L Hopkins & Co. Importers, Millers and Manufacturers New York NY.
Photographed with a spoonful of original contents.

Hopkins' White Henna Compound, marketed in the 1920s and 1930s contained no henna whatsoever. The laboratory at Kent State University department of geology analyzed a sample of the contents of a box of 'Hopkins' White Henna Compound' and found it to be hydromagnesite, hydrated magnesium carbonate mineral, $Mg_5(CO_3)_4(OH)_2 \cdot 4H_2O$.⁶⁷ Hydromagnesite is normally used for whitewashing walls and fences.

⁶⁷ Smith, A. PhD, (2008) professor, Kent State University Department of Geology

Rohrer included a formula for “white henna” which seems to have included Hopkins’ white henna or a similar product, in which he does not differentiate between henna, *lawsonia inermis*, and “white henna.”

“White Henna Formula

Henna powder – 1 ounce

Powdered citric acid – 1 dram

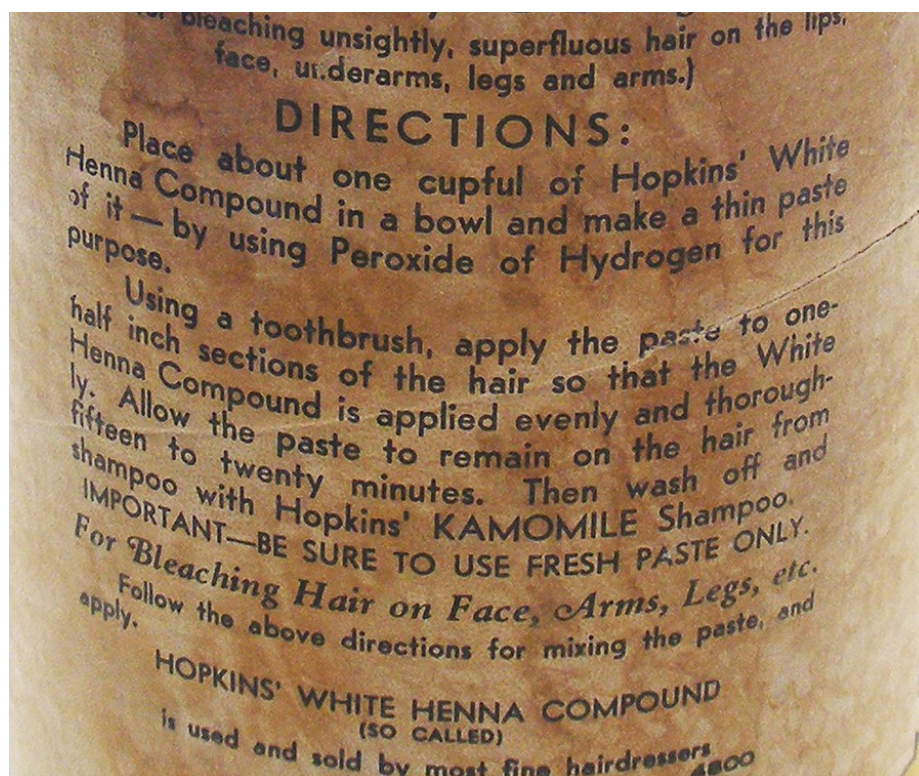
Sodium perborate – 4 oz

First wash the hair with a mixture of:

1 ounce of ammonia water (26%)

15 ounces of water

Then apply the henna as paste, like any other henna dye.”⁶⁸



Hopkins’ White Henna Compound, instructions for use on back of package⁶⁹

Oscar Levin MD reviewed the “white henna” product in 1928, “Shall I Dye My Hair.” His analysis was consistent with the laboratory analysis:

“Beware of Henna Compounds

⁶⁸ Rohrer, J. (1924) *Rohrer’s Illustrated Book on Scientific Modern Beauty Culture* Prof. Rohrer’s Institute of Beauty Culture, NYC. NY. P. 24

⁶⁹ Private collection, Catherine Cartwright-Jones PhD

“In speaking of henna, I might mention here that the so-called "white henna" is a misnomer. It contains no henna, but is rather a mixture of magnesium oxide and magnesium carbonate, made into a paste by mixing it with hydrogen peroxide, or peroxide and ammonia. One might just as well be using pure hydrogen peroxide, at a much cheaper price.”⁷⁰

The hydromagnesite and peroxide process was extremely damaging to hair. Peroxide bleached the melanin in the core of the hair and made the hair structure porous. The magnesium, applied as a pack, filled the pores left in the hair by the peroxide. Peroxide by itself dried the hair, magnesium would dry it more. The magnesium carbonate would make the hair as white as the lightest albino hair, as white as a white cat. The “white henna” product and technique was again described as harmful in 1938 in “The American Journal of Nursing.”⁷¹

The title "peroxide blonde" has been more or less uncomplimentarily applied to those women who bleach their hair by means of some preparation releasing free oxygen. This has been done by preparing a solution consisting of peroxide of hydrogen to which a small amount of ordinary household ammonia has been added. Several rinses with such a substance will make the hair several shades lighter. The ammonia removes some of the natural oil from the scalp and hair and may cause the latter to become dry and lustreless, and even to break off or to fall out. There has been a tendency, of late, to employ a stronger substance such as sodium perborate. Again, the hair may be injured if the solution is too strong. The so-called "white henna" is made from hydrogen peroxide, ammonia, and magnesium carbonate. It has the same defects as those already mentioned.”

In 1939, Regrove described “white henna” as different from henna,⁷²

“When used alone, henna produces only auburn. It is, therefore, generally employed in combination with other dyes. ... It may, however, here be added that of the many such preparations now on the market, some would appear to owe their efficacy to as dyes mainly to the other ingredients, including the dangerous dye para-phenylenediamine. Indeed, there is an unfortunate and misleading tendency to use the word “henna,” because of the known harmlessness of the material, as a pleasing term for any hair dye.

“The height of absurdity was reached when, a few years ago, “white henna” made its appearance on the market. “White henna” is a euphemism for a hair bleach to be applied in pack form. For example, such a bleach can be made by mixing 6 to 7 parts of

⁷⁰ Levin, O. MD. (1928) “Shall I Dye My Hair? The Question that Woman Soon or Late, Answered by a Distinguished Physician, Oscar Levin, MD *Good housekeeping: Volume 86, Number 2*, p. 161 curated 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>

⁷¹ Hazen, H. H. (1938) *The American Journal of Nursing*, Vol. 38, No. 7 pp. 791-798 Lippincott Williams & Wilkins

⁷² 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. 74-5

magnesium carbonate with 4 to 3 parts of sodium perborate; but the action of such a bleach is apt to be more drastic than that of hydrogen peroxide owing to the high degree of alkalinity produced on addition of water.”

Jean Harlow’s hairdresser, Alfred Pagano said that he used peroxide, ammonia, and Lux flakes⁷³ to bleach her hair. Based on the time period and the visual characteristics of her trademark platinum blonde hair, he may have also used “white henna” to achieve the final color. Her hair became brittle, fragile, and broken with the weekly treatments. By 1936, her hair had broken and fallen out to such an extent that she wore wigs.



Right: Jean Harlow (born Harlean Harlow Carpenter; March 3, 1911 – June 7, 1937) protege of Howard Hughes.

Harlow's white shade resembled the hair color of albinos, considered freaks in that day and thus objects for sexual fetishization, a film trope connecting albino white hair to perverse sexuality⁷⁴ as opposed to other shades of blonde hair used to portray child-like innocence. When actresses were required to have platinum hair for an erotic role but did not want to have their hair destroyed by “white henna”, they requested wigs. “Natasha Rambova wore a platinum wig as “Salome” in the film version of Wilde's *Salome* (1923). Greta Garbo, Anna Nielsen wore a platinum wig, playing a brothel madam, and so did Pola Negri in “*Three Sinners*” (1928). In early scenes of “*As You Desire Me*” (1932), Greta Garbo, playing a decadent cabaret performer,

⁷³ Orci, T. (February 22, 2013) “The Original 'Blonde Bombshell' Used Actual Bleach on Her Head” *The Atlantic*

⁷⁴ Barnes, E. “Jean Harlow in the 30's” *Los Angeles Illustrated News*, June 30, 1930, (Hollywood, CA: Filming Today Press, 1996) ed. G. D. Hamman

wore a platinum wig, as did Marlene Dietrich in “Blonde Venus” (1932), when she emerged from a gorilla suit.”⁷⁵

The ‘white henna’ process did not disappear after Jean Harlow, though many other actresses bleached their hair nearly white without an added mineral pack. ‘Candy Darling’, a protégé of Andy Warhol, memorialized in Lou Reed’s “Walk on the Wild Side,”⁷⁶ repeated the technique in⁷⁷ the late 1960’s.



Candy Darling, (born James L. Slattery, November 24, 1944 – March 21, 1974) Protégé of Andy Warhol

⁷⁵ Banner, L. (2008) “The Creature from the Black Lagoon: Marilyn Monroe and Whiteness” *Cinema Journal*, Vol. 47, No. 4, pp. 4-29, University of Texas Press on behalf of the Society for Cinema & Media Studies

⁷⁶ Reed, L. (1972) “Walk on the Wild Side” *Transformer*

⁷⁷ Heide, R. (2015) “Riots at the Stonewall and Magic at Caffè Cino; Gay revolution in Greenwich Village in the ‘60s.” *The Villager*. <http://thevillager.com/2015/06/25/riots-at-the-stonewall-and-magic-at-caffe-cino-gay-revolution-in-greenwich-village-in-the-60s/>

“I myself hit the Stonewall a few times back in the early days with a brownette, pointy-toothed Candy Darling. This was before he/she was given a makeover by the flamboyant Off Off Broadway theater director Ron Link, who taught Candy how to do her makeup in 1930s movie-star style.

“The newly glamorized Candy was presented in a show written by Jackie Curtis at Bastiano’s Cellar Studio Theater in the Village called “Glamour, Glory and Gold,” which featured in his first stage role a young actor named Robert De Niro. For the Candy transformation, Link got out a white henna powder concoction that, when mixed with peroxide and pure ammonia and applied to dark hair, turned it platinum-white blonde, thus changing a drab Candy into a Kim Novak/Jean Harlow blonde bombshell.”

How Pure Egyptian Henna Became Nestle “Not Henna”



Left: Egyptian Henna For Tinting The Hair A Titian Red, V. Vivaudou. Inc. 2 ¾ oz.
New York, approximately 1930, author’s collection

Right: Instructions for Egyptian Henna distributed by V. Vivaudou

Vivaudou henna⁷⁸ was a popular henna product registered in commercial use in 1926. “Consumers Union Reports,” Volume 5, Issue 12, listed it as pure henna, and harmless. The trademark with an image of a woman with the Egyptian vulture crown⁷⁹ was filed at the end of that year. Subsequently, Riker Laboratories⁸⁰ marketed “Egyptian Henna for Tinting the Hair A Titian Red” under their own company name with a similar but slightly updated trademark.

⁷⁸ *Congressional Series of United States Public Documents*, Volume 6927 (1916) “Riker and Hegeman Company owned all the capital stock of Hegeman Drug Company, Riker Laboratories (Inc.), Arly (Inc.) and V. Vivaudou .” p. 86.

⁷⁹ The vulture crown was an ancient Egyptian crown worn by royal wives, a symbol of protection from the goddess Nekhbet.

⁸⁰ Riker Laboratories, Division of United Drug Company, Boston, USA

The instructions were consistent with Redgrove's recommendation for henna mixing, "The preferred method, whether henna is used alone or in combination with other dyes, is the cataplasm or pack method,"⁸¹ The rinses recommended were probably meant to compensate for the fact that short-duration hot packs create a stain that fades, so must be refreshed regularly.



Left: Egyptian Henna for tinting the hair a Titian Red, Riker Laboratories, a division of United Drug Co., Boston, USA, Net weight 3.5 g

Right: Directions: To tint the hair auburn or titian red, first shampoo thoroughly to remove oil, rinse well, and partially dry. Make a thick paste of the henna powder with hot water, divide hair into strands, and anoint freely with the paste. Rinse hair thoroughly after the desired depth of color is obtained.

Henna, both henna-rasticks, and henna-rengs were not a particular problem for the invention of "Marcelling," a 'hot tongs' method of crimping hair into waves. François Marcel Woelfflé, later François Marcel, patented his instruments for the techniques as "Curling-Iron" in 1905 and the "Hair-Waving Iron" in 1918. Henna stains typically darken with heat, but the hair is not otherwise damaged. The henna-rastic (with metallic salts and pyrogallol) did not interfere with heat, nor did the henna-reng (henna and indigo).

The development of chemical solution permanent waving, commonly called a perm or "permanent", involved the use of reagent chemicals with or without heat to break and reform the

⁸¹ 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. 45

cross-linking bonds of the hair structure. The chemicals used in permanent wave solution cross-reacted with the metallic salts in compound henna.



Left: Magazine advertisement for Egyptian Henna, V. Vivaudou, early 1920s⁸²
Right: Madame William Randolph Hearst (Marion Davies) by Erté early 1920s, with permed, hennaed hair⁸³

Advertising text from V. Vivaudou Egyptian Henna above, “Nowadays the youthful simplicity of hair arrangement requires that it be natural, colorful and lustrous. If sitting bareheaded on the beach has made your hair sun-streaked, or if it has become drab, faded, or gray, use Egyptian Henna to give it new life and lustre, or to restore the auburn shade. And if you’ve acquired curly locks via the “permanent” method, you’ll be glad to know that this Egyptian Henna (unlike others) will take a permanent beautifully.”

Hair dyed with pure henna or a henna-reng could be permed into fashionable curls, and Vivaudou Egyptian Henna was promoted as being suitable for use with perm solution. The advertisement above advertisement indicates that people understood that there were some products sold as ‘henna’ containing mineral salts (compound henna or henna-rasticks) that were unsuitable for use with permanent wave solutions. Redgrove explained,

⁸² Author’s collection, Catherine Cartwright-Jones PhD.

⁸³ Author’s collection, Catherine Cartwright-Jones PhD.

“Speaking generally, dyeing with henna-rasticks is simpler than dyeing with henna-reng. Hair so dyed, however, can be permanent waved only with considerable difficulty.

“This is due to the loss of that instability in the polypeptide chains of the hair keratins which is essential to the process of permanent waving. It has been shown that the chief linkages in the chains which are involved in permanent waving are the cystine and cysteine linkages. These contain practically all of the hair’s sulphur content. The metallic dyes, however, react with the sulphur of these linkages to produce sulphides and metallic sulphide complexes. And in proportion as the cystine and cysteine are decomposed by the metallic salts, so does the hair lose its ability to be permanently waved.”⁸⁴



Madame William Randolph Hearst (Marion Davies) by Erté, early 1920’s, with permed, hennaed hair, detail

In 1971, the Nestle-Le Mur Company bought the rights to the Egyptian Henna trademark from Rikker Laboratories, and continued using the Egyptian inspired pattern motifs and the woman with the vulture crown.⁸⁵ Joseph Lindemann was the pharmaceuticals manufacturer who established Nestle-Le Mur Company and produced Nestle® Egyptian Henna.

⁸⁴ Rohrer, J. (1924) *Rohrer’s Illustrated Book on Scientific Modern Beauty Culture* Prof. Rohrer’s Institute of Beauty Culture, NYC. NY. P. 80

⁸⁵ <https://trademarks.justia.com/716/08/egyptian-71608121.html> EgyptianHenna 1926-12-31 first filing, first commercial use. 1971-12-25 Renewal NESTLE-LE MUR COMPANY, THE

**MAKE IT SHINE!
MAKE IT BOUNCE!
MAKE IT LOVELY!**



Nestle®
"THE ORIGINAL"
EGYPTIAN HENNA
NEUTRAL—Adds No Color



The fabulous way to give your hair new body, life and lustre ...with the first application.

Nestle Egyptian Henna Shampoo with "Pearls of Beauty" Enriches every strand, improves texture and adds dazzling highlights.

Egyptian Henna Hot Oil Treatment Revitalizes and restores life, shine and body to problem hair.

Try them—you'll love your super beautiful hair.

The Nestle-LeMur Company, New York 10016

**GIVE YOUR HAIR
SUPER SHINE!
SUPER BODY!
SUPER BOUNCE!**



Nestle®
EGYPTIAN HENNA
SHAMPOO & CONDITIONERS
NEUTRAL—Adds No Color



The fabulous way to give your hair new body, life and lustre ...with the first application.

Nestle Egyptian Henna Shampoo and Conditioners enrich every strand, improve texture and add dazzling highlights... without changing your hair color. Try them—you'll love your super beautiful hair.

WANT TO GO RED?
Use Nestle Egyptian Henna—Natural Color

THE NESTLE-LEMUR COMPANY, NEW YORK, 10017

Magazine advertisements from the early 1970's for Nestle® "The Original" Egyptian Henna products.⁸⁶

The Nestle-Le Mur Company developed a number of products marketed under the brand Nestle Egyptian Henna: Nestle® Egyptian Henna Conditioning Shampoo, Nestle® Egyptian Henna Pre-Mixed Hair Conditioner, Nestle Egyptian Henna Intensive Hair Conditioner, Nestle Egyptian Henna Hot Oil Shampoo enriched with "Pearls of Beauty," and Nestle Egyptian Henna Hot Oil

⁸⁶ Author's collection, Catherine Cartwright-Jones PhD

Treatment. Though all of these were advertised as Original Egyptian Henna; none of these contained any appreciable amount of henna, and probably no henna whatsoever⁸⁷. They were described as being Neutral, none added color to hair.

The Nestle-Le Mur Company did manufacture a henna product that seems to have been largely henna, based on residue in original packages.



Nestle® Egyptian Henna, metal container front and side, 1970’s, author’s collection



Nestle® Egyptian Henna package, ingredient declaration and USFDA compliant warning, 1970s⁸⁸

⁸⁷ Author’s note: I have not been able to locate an original item, nor an ingredient declaration for the Nestle® Egyptian Henna Conditioning Shampoo, Nestle® Egyptian Henna Pre-Mixed Hair Conditioner, Nestle® Egyptian Henna Intensive Hair Conditioner, Nestle Egyptian Henna Hot Oil Shampoo enriched with “Pearls of Beauty”, or Nestle® Egyptian Henna Hot Oil Treatment.

⁸⁸ Author’s private collection, Catherine Cartwright-Jones PhD

The instructions:

“HENNA PACK: Adds permanent color as it conditions. TO USE: Shampoo, towel dry. Wear plastic gloves, empty contents of can into glass bowl, add enough hot water to make a thick paste. Stir until smooth. Start at top, part hair. With small brush apply the hot paste to hair roots on both sides of part, then work into hair. For Light Brown hair, leave on 10 – 20 minutes; for Dark Hair, 30 – 60 minutes using strand test as a guide. Remove with warm water. Shampoo, rinse thoroughly. For touch up on new growth, apply Henna paste to roots only. To keep color fresh looking, use a henna rinse. HENNA CONDITIONING RINSE: Adds exciting highlights, shine and body. Hair looks and feels thicker and fuller. TO USE: Shampoo hair. Dissolve 3 tsp of henna in 1 quart of hot water, then pour through hair 3 or 4 times. Leave on hair 10 minutes, rinse with warm water. CONTAINS: ONE PACK OR, TEN RINSES (package contains 2 ¾ oz.)”

The instructions are consistent with the henna product having unlisted additives, based on the brief application time and small proportion of powder. The recommendation of a henna rinse indicates that the result of this hot water method was prone to fading. The admonition against using the product on straightened or permanent waved hair, and that it was not recommended for gray, blonde, or bleached further support the interpretation that this was not pure henna.



Any pure henna prepared with hot water and applied for a brief period, as is recommended in henna instructions through the mid 20th century gives a brassy color to pale hair which will fade over time. A the hot mix prevents the aglycones from forming and binding with keratin with a Michael addition.⁸⁹ It is unknown whether the hot water method was recommended for speed and efficiency or to sell more henna to be used in the constant rinses necessary for color refreshing.

In addition to this auburn or Titian henna, Nestle-LeMur developed “Neutral Henna,” “Black Henna,” and “Brown Henna” products, which, despite their branding, contained very little henna. It is difficult to say whether the branding, “Egyptian Henna,” with the woman with the vulture crown, used for decades for a pure henna product was a deliberate attempt to play upon the public’s ignorance and to mislead them about the henna content, and the nature of henna.

⁸⁹ See “Henna, Cassia, and Mildly Acidic Mixes” in page one of Ancient Sunrise® Chapter 6, Henna and Acidic Mixes: http://www.tapdancinglizard.com/AS_henna_for_hair/chapters/chap6/6_henna-cassia-acids.pdf

Whether or not the intention of this labeling of these products was meant to be deceptive, it had the effect of contributing to the misinformation about henna.



Nestle® Egyptian Henna, neutral, for black hair, and for brown hair, marketed by Nestle-LeMur in the 1970's



Ingredient and description of product, Nestle® Egyptian Henna Neutral (Colorless) Henna

As an explanation of these ingredient declarations: ingredients are required to be in descending order of quantity in the product formulation. In each of these, henna is last or next to last in the declarations, so a proportionally small amount of henna has been mixed into thickeners and surfactants. Lactose is milk sugar. Corn starch is a flow agent in powdered products. Methyl cellulose is a thickener. Quaternium-5 is a quaternary ammonium salt used as a surfactant. Those were the primary ingredients; henna was not. Nestle had figured out how much they could dilute the henna, still get some color, and not immediately drip down someone's back. Despite the

branding, this product had very little henna, added no color to hair, and was used as a sort of ‘mix up and shampoo in conditioner’.⁹⁰



Nestle® Egyptian Henna for Black Hair ingredient declaration: Lactose, Corn Starch, Hydroxypropyl Methyl Cellulose, Quaternium-5, Henna, Iron Oxides.



Nestle® Egyptian Henna for Brown Hair ingredient declaration: Lactose, Corn Starch, Hydroxypropyl Methyl Cellulose, Quaternium-5, Henna, Iron Oxide.

The Nestle® Egyptian Henna for Brown Hair and Black Hair were also powdered mixtures meant to disperse a very small amount of henna with some iron oxide into water to be shampooed into hair. The product was harmless and did not interfere with oxidative dyes or perm solutions. Any color from the henna and iron oxide would have been very temporary. The company was sold in 1983 and Mr. Lindemann died in 1985.

An article in the New York Times, “All About: Henna, for Hair with a Shine” in January of 1977⁹¹ provides insight into mid-century misconceptions about henna, what sources were spreading misinformation, why stylists were persuaded by the chemical hair dye companies to distrust henna and how this disinformation proliferated into public consciousness in general, and among stylists in particular.

By the mid-1970s the henna brands generally available in the USA were Colora, Hopkins, HennaLucent, Rainbow Research, and Nestle-Le Mur. Though each of these brands had at least one henna product that was mostly henna, all of these brands sold products with various ‘colors’

⁹⁰ Capek, K. Chemist, member of the Society of Cosmetic Chemists

⁹¹ Taylorjan A., January 19, 1977, “All About: Henna, for Hair With a Shine” *The New York Times*, page 52. The New York Times Company, NY, NY <https://www.nytimes.com/1977/01/19/archives/all-about-henna-for-hair-with-a-shine.html>

of henna. The other colors were formulated other dye plants, metallic salts, or other dyes to create these colors, and these were rarely declared.

Clairol issued a statement on henna, “It is difficult for a company like ours to get involved in it,” said Dr. John Menkart, vice president for technology. “We can't control it.” Also, “Used on very light or gray hair, it can give a miserable orange color. It can be horrendous on bleached hair. Hair that has had a permanent wave is more absorbent and henna can produce undesired effects. Rinsing out the goop is a difficult job, if you don't rinse properly, you have a mess.”⁹² Menkart of Clairol either did not understand the chemistry of henna and how to use it, or he chose disregard it. Or, he wanted to cast aspersions on henna so that people would be misinformed and cease to use henna rather than Clairol’s highly profitable home hair oxidative dye kits brought onto the market in 1955.

Other spokespersons for Clairol and the oxidative hair dye industry continued to repeat the corporate line and disinformation. Leslie Blanchard, a top New York colorist, a consultant to Clairol, stated, “As a colorist, I have to think of the negative aspects,” he said. “Henna is difficult to control, I can't be sure of the color I'm going to get. With regular coloring products, you can compensate for permanents or species hair conditions. You can't get shading with henna. It stains the hair and is difficult to remove. If you don't like the color, you have to wait months for it to wear off. You can't always change it by putting a chemical dye over it.”⁹³ Leslie’s concerns were problems with compound henna, not pure henna, and he either did not know the difference between compound and pure henna, or the product with mislabeling prevented him from knowing, or he chose to misinform people based on the Clairol corporate statement on henna.



Packages of henna produced in Iran, marketed in Russia, 1990's⁹⁴

Small importers, people who had migrated from countries where henna had been used for centuries wanted to import, develop and promote henna. Meir Wersavik, who, with his wife, owned Les Cheveux Vixi in Scarsdale, N.Y. The Wersaviks were Israeli, and had a reliable henna exporter in Tehran, and were exploring opening a henna distributorship in the USA. Iran

⁹² Ibid

⁹³ Ibid

⁹⁴ Author's collection, acquired from Katrin Alekand, Estonia.

had a well-developed henna industry and supplied henna to Russia and Eastern Europe for centuries, but the Iranian revolution in Jan. 16, 1979, limited that opportunity in the USA. French-born Jacques Siboni, used henna in his Monsieur Jacques salon at 45 West 55th Street, New York, NY. He was familiar with henna from living and working Morocco. He purchased Moroccan henna for his salon from a small importer, and formulated his dyes from “red, black, and neutral hennas,” which he recognized by smell.⁹⁵ These were, of course, not all henna. These would have been henna, indigo, and cassia obovata which have a very similar appearance, but which have distinct smells. All of these dye plants were imported as red, black, and neutral henna without specification of the plant species until recently. Because the FDA allowed henna to be imported exempt from certification, it was simpler to bring these products in under the name ‘henna,’ hoping that the product would never have a microscopy, HPLC, or DNA analysis.

Wersavik passed on crucial disinformation about the products known as red, black, and neutral henna to Talorjan, who disseminated this as received truth to the readership of the New York Times, “(Wersavik) took the visitor into the salon storeroom and opened three drums of henna. Red henna—actually a mustard color in its powdered form—comes from the leaves of the plant, he said, and, imparts the lighter red colors. Black henna (light green in powder) comes from the roots of the plant; is used on dark hair for deep tones, and is sometimes mixed with strong coffee to darken it further. Then there is neutral henna (it looks like fine sand) which is made from the plant stems and gives no color, but adds shine and body to the hair.”⁹⁶ Wersavik’s statements were botanic nonsense. It cannot be determined whether this was meant to deliberately misinform and confuse customers (and the author of the New York Times article), or whether this was simply a widespread fiction spread by the henna industry to protect itself from competition.

IN 1977, the US Food and Drug Administration’s policing of henna imports was limited to spot-checking according to the director of the division of cosmetics technology, Hans Eierman.⁹⁷ Henna was granted a permanent exemption from certification for use as a hair dye in the 1930’s because of its record of safety and reliability.⁹⁸ Either the FDA was not concerned about the fiction of “black henna, brown henna, and neutral henna,” or perhaps the exact contents were unknown to them.

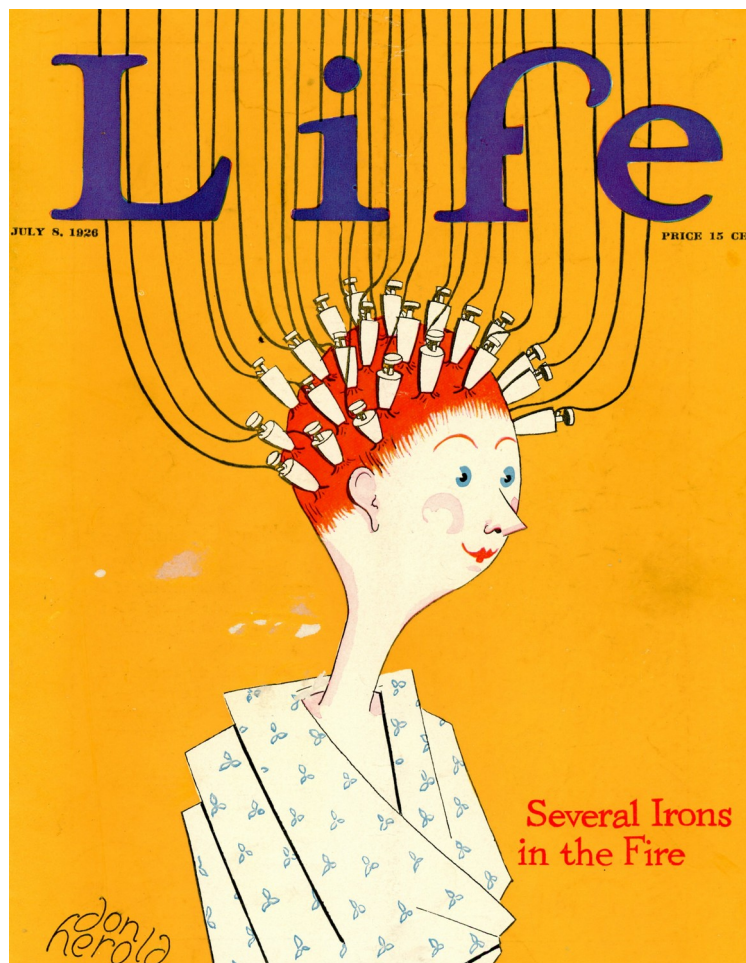
⁹⁵ Taylorjan, A., January 19, 1977, “All About: Henna, for Hair With a Shine” *The New York Times*, page 52. The New York Times Company, NY, NY <https://www.nytimes.com/1977/01/19/archives/all-about-henna-for-hair-with-a-shine.html>

⁹⁶ Ibid

⁹⁷ Ibid

⁹⁸ (e) *Exemption from certification*. Certification of this color additive for the prescribed use is not necessary for the protection of the public health and therefore batches thereof are exempt from the certification requirements of section 721(c) of the act. [Code of Federal Regulations] [Title 21, Volume 1][Revised as of April 1, 2017][CITE: 21CFR73.2190] TITLE 21 – FOOD AND DRUGS CHAPTER I – FOOD AND DRUG ADMINISTRATION DEPARTMENT OF HEALTH AND HUMAN SERVICES SUBCHAPTER A—GENERAL PART 73 – LISTING OF COLOR ADDITIVES EXEMPT FROM CERTIFICATION Subpart C – Cosmetics Sec. 73.2190 Henna. <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcr/CFRSearch.cfm?fr=73.2190>

Stylists knew that there was a problem with products labeled as henna. A chemist who tested the henna products found as little as 20 percent henna in them.⁹⁹ Stylists who used compound henna products with undeclared contents experienced the consequences: adulterated henna would inexplicably give green results, hideously orange results, and might damage or destroy hair when applied over or under oxidative dyes, bleaches, and perm solution. The lack of transparency in the henna business and widespread misinformation about contents and methods led to most stylists responding to henna with revulsion. If there had been complete ingredient declaration of henna products as they evolved from henna to henna-rasticks to henna-rengs and further, henna might have retained its trust and respect among stylists and clients and remained a viable alternative to oxidative hair dyes in the marketplace.



“Several Irons in the Fire” Life Magazine, July 8, 1926

The popularity of permanent wave solution was problematic for compound henna with undeclared additives and adulterants.

⁹⁹ Taylorjan, A., January 19, 1977, “All About: Henna, for Hair With a Shine” *The New York Times*, page 52. The New York Times Company, NY, NY

<https://www.nytimes.com/1977/01/19/archives/all-about-henna-for-hair-with-a-shine.html>

Compound henna: Part 3 Para-phenylenediamine and Henna

August Wilhelm von Hoffmann discovered para-phenylenediamine, oxidative dyes, in 1863. The first patent for its use in hair dye was taken out by Monnet in 1883.¹⁰⁰ In Monnet's patent, he found he could dye hair shades of brown by immersion in a solution of para-phenylenediamine or 2,5-toluenediamine, by using hydrogen peroxide or another oxidizing agent. A further series of patents for coal tar derivative hair dyes were granted to H. and E. Erdmann between 1888 and 1897.¹⁰¹ The Erdmann patents added p-aminophenol, 2,4-diaminophenol, 2,3,6-triaminophenol, some N-substituted derivatives of p-phenylenediamine and p-aminophenol, and 1,5-dihydroxyand 1,5-diaminonaphthalene to the oxidation bases. During the next thirty years, more than one hundred fifty further compounds were claimed for variants of oxidative dyes in over seventy-five patents; the early patents were held by textile companies, then formulated for fur dyes, and subsequently applied to on-head application to human hair.



Oscar Fingal O'Flahertie Wills Wilde, Irish poet and playwright, (16 October 1854 – 30 November 1900) photograph by Napoleon Sarony, New York in 1882. Wilde dyed his graying hair with henna while living in Paris in the early 1890's, but he seems to have dyed his hair with para-phenylenediamine when in prison, the dye probably causing the severe skin reactions observed during that time, 1895 – 7.

Hair dye entrepreneurs tried various chemicals including the newly developed coal tar based para-phenylenediamine dyes. When applied to pelts, para-phenylenediamine was an effective

¹⁰⁰ Corbett, J. F., (1971) "II. Oxidative Hair Dyes," *The Chemistry of Synthetic Dyes, Volume 5*, edited by K Venkataraman, National Chemical Laboratory, Academic Press New York and London. p. 479

¹⁰¹ H. Erdmann and E Erdmann, DRP47,349;51,073; 80,814; 92,006; 98,431.

dye, but living skin often reacted with severe contact dermatitis and delayed hypersensitivity reactions. Fur dyers became ill,¹⁰² and legislation was introduced to protect workers. At about this time, Oscar Wilde¹⁰³ suffered from a painful and itchy rash with red blotches, hypothesized to have been caused by his use of para-phenylenediamine hair dye to cover his graying hair.¹⁰⁴

Eugène Schueller,¹⁰⁵ the founder of *Société Française de Teintures Inoffensives pour Cheveux*, the French Safe Hair Dye Company later known as L'Oréal, was recognized for creating the first commercially marketed synthetic dye for hair in 1907.¹⁰⁶ He was also an innovator of mass marketing. He spent twenty years developing and marketing his new products, advertising, and subsidizing coiffeurs who would use his products in their salons. By 1920, coiffeur Raul Patois wrote that the sales of cheap hair dye had quintupled from the period before WWI, stating that, “*Teinture* is not the most agreeable work in the profession, but it is without comparison the most lucrative.”¹⁰⁷ By 1915, the dangerousness of para-phenylenediamine was well understood by the scientific and medical community, as noted in “Cosmetics as Drugs: A Review of Some of the Reported Harmful Effects of the Ordinary Constituents of Widely Used Cosmetics” in *Public Health Reports*,¹⁰⁸ if ignored by those profiting from the new industry.

“Of the potent drugs of a possibly harmful nature that are used in so-called "hair restoratives" it will suffice to mention: Lead acetate, silver nitrate, paraphenylene diamine and resorcin.¹⁰⁹

“The latter preparations serve very well to show the gullibility of that portion of the public that is desirous of improving its facial appearance. ... Paraphenylene diamine is an aniline derivative, which by oxidation becomes black or brown. The poisonous qualities of this chemical are well known. A number of cases of poisoning from the use of the compound as a hair stain and even from wearing hose dyed with this chemical have been reported.

¹⁰² “Symptoms such as persistent headache, nausea, vomiting, anemia, loss of weight, loss of appetite, and “fur dye asthma” were noted. Innumerable cases were brought to the attention of physicians, until measures had to be taken to protect the people.” From Levin, O., (1928) “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. page 158

¹⁰³ For more information about Oscar Wilde, henna, and hair dye, read Oscar Wilde’s Hair and Skin: Investigations into His PPD Sensitization and Use of Henna by Rebecca Chou, <https://www.ancientsunrise.blog/oscar-wilde/>

¹⁰⁴ Nater, J. P., 1992 “Oscar Wilde's skin disease: allergic contact dermatitis?” *Contact Dermatitis*, Vol. 27, 1, 47 – 49, Blackwell Publishing Ltd

¹⁰⁵ Gladwell, M. (March 28, 2011). "The Color of Money" *the New Yorker Magazine* “During the early twentieth century, Schueller provided financial support and held meetings for La Cagoule at L'Oréal headquarters. La Cagoule was a violent French fascist-leaning, antisemitic and anti-communist group whose leader formed a political party Mouvement Social Révolutionnaire (MSR, Social Revolutionary Movement) which in Occupied France supported the Vichy collaboration with the conquerors from Nazi Germany.”

¹⁰⁶ Pointer, Sally (May 1, 2005). *The Artifice of Beauty: A History and Practical Guide to Perfume and Cosmetics*. The History Press.

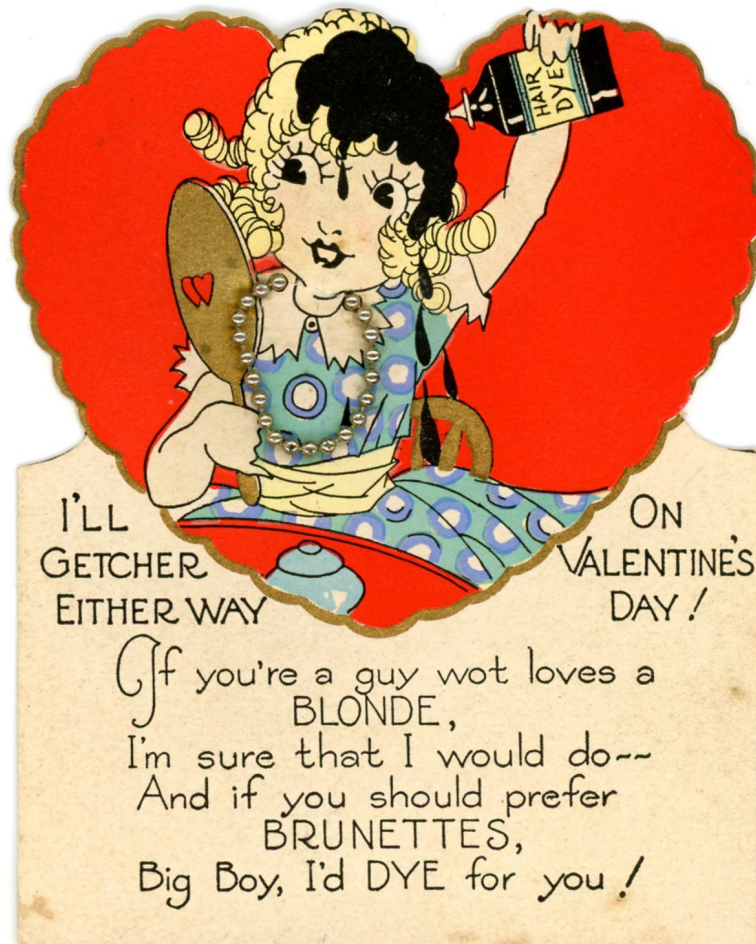
¹⁰⁷ *La Coiffure de Paris*, January 1920

¹⁰⁸ Wilbert, M. I. (1915) “Cosmetics as Drugs: A Review of Some of the Reported Harmful Effects of the Ordinary Constituents of Widely Used Cosmetics” *Public Health Reports* (1896-1970), Vol. 30, No. 42 (Oct. 15, 1915), pp. 3059-3066. Sage Publications, Inc.

¹⁰⁹ *Ibid*, p. 3062

“Resorcin is one of the frequently occurring constituents of hair tonics. In common with other coal-tar derivatives, it is highly toxic, because of the production of methemoglobin. Some persons are particularly susceptible to its influence and many cases of collapse and even death from the external use of resorcin are on record.

“In conclusion it may be worthwhile to quote from some of the published analyses of cosmetics to demonstrate the dangerous character of many of these preparations and the fraudulent nature of others.¹¹⁰



American Valentine card,¹¹¹ 1920's implies that a woman would readily dye her hair to secure the romantic attentions of a male partner.

¹¹⁰ Ibid, p. 3064-5

¹¹¹ Author's private collection, Catherine Cartwright-Jones PhD

Hair dye and the Culture of Youth, Modernity, and Convenience following WWI

BANISH GREY HAIR
Wm. J. Brandt
Liquid

EAU DE HENNA

Hair Color Restorer



covers the grey, and restores the color to grey, faded, bleached, or streaky hair, leaving it Soft, Glossy and Natural.

Works so well no one will know the color has been restored. Covers ALL the grey; covers ANY grey, no matter how stubborn or how caused.

Does not interfere with permanent waving.

Eau de Henna is two liquids, one application. It colors at once. No mess. No pack. Does not shade off reddish as with many powdered Hennas.

Anyone Can Put It On

No experience necessary. Will not rub off. Not affected by sea bathing, sun, shampooing, or permanent waving. Will withstand tropical climates.

Wonderful For Touching Up

You can put it on just where it is needed. Can be used where powdered henna dyes have been used. The shades blend in beautifully. Can be used over other hair dyes or restorers. Directions in English and Spanish.

Eau de Henna comes in colors: Black, dark brown, medium brown, light brown, drab, blond, auburn. Price postpaid \$2.50 or C. O. D. \$2.72.

Order through your Druggist, Department Store or Beauty Parlor, or direct from us.

HAIR SPECIALTY CO.
Dept. 121, 112 East 23rd St., New York
Men as well as women can use Eau de Henna to advantage.

Eau de Henna was widely in newspapers in 1923 and 1924¹¹². The available colors advertised were black, dark brown, medium brown, light brown, drab, blond, and auburn. This ad reappeared with a different image, but similar copy in *Ebony* magazine, November 1963.

“Eau de henna” had no listed ingredients; it was available in several colors. The claim that it did not interfere with permanent waving eliminates the possibility that it might have been a progressive metallic salt dye or compound henna. The text also implied that it was more convenient than real henna (referencing a “pack” and a “powder”). The name was certainly misleading; it cannot have been henna, because it was two bottles of clear liquid. The fact that

¹¹² *Waco News-Tribune*, Waco, Texas, October 24, 1924, page 8. *Brooklyn Daily Eagle*, New York, March 25, 1923, *Wilkes-Barre Record*, Wilkes-Barre Pennsylvania, April 21, 1923

the contents were two clear liquids indicates that it was almost certainly para-phenylenediamine (or an equivalent oxidative dye) and peroxide, though there is no ingredient declaration, nor are there any warnings. The advertising text of Eau de Henna emphasizes its convenience and effectiveness, as well as differentiating it from actual henna:

“Banish Grey Hair Wm. J Brandt Liquid
Eau de Henna Hair Color Restorer

“covers the gray, and restores the color to grey, faded, bleached, or streaky hair, leaving it Soft, Glossy, and Natural.

“Works so well no one will know the color has been restored. Covers ALL the grey; covers ANY grey, no matter how stubborn or how caused.

“Does not interfere with permanent waving.¹¹³

“Eau de Henna is two liquids, one application. It colors at once.¹¹⁴ No mess. No pack. Does not shade off reddish as with many powdered Hennas.

“Anyone Can Put It On.

“No experience necessary. Will not rub off. Not affected by sea bathing, sun, shampooing, or permanent waving. Will withstand tropical climates.

“Wonderful For Touching Up

“You can put it on just where it is needed. Can be used where powdered henna dyes have been used. The shades blend in beautifully. Can be used over other hair dyes or restorers. Directions in English and Spanish.

“Eau de Henna comes in colors: Black, dark brown, medium brown, light brown, drab, blond. Auburn. Price postpaid \$2.50 or C. O. D. \$2.72.

“Order through your Druggist, Department Store, or Beauty Parlor, or direct from us.

“Hair Specialty Co.
Dep 121, 112 East 23rd St., new York.
Men as well as women can use
Eau de Henna to advantage”

¹¹³ This descriptor eliminates the possibility of a progressive dye or compound henna.

¹¹⁴ This descriptor eliminates any possibility that the product is henna, *lawsonia inermis*. The descriptor is most consistent with a para-phenylenediamine hair dye.

Marketing Para-Phenylenediamine Hair Dyes to Women in the Years Following WWI

David Hume¹¹⁵ wrote in “Enquiry Concerning the Principles of Morals,” Sec. 9, Pt. 2, in 1751, “Political writers have established it as a maxim, that, in contriving any system of government, and fixing the several checks and controls of the constitution, every man ought to be supposed a knave, and to have no other end, in all his actions, than private interest. By this interest we must govern him, and, by means of it, make him, notwithstanding his insatiable avarice and ambition, co-operate to public good.” The companies which marketed hair dye containing para-phenylenediamine who knew their product could cause severe injuries were, as Hume would characterize, “sensible knaves.” These hair dyes were highly profitable, and their advertising copy was persuasive.

NOTOX NOTOX NOTOX NOTOX NOTOX NOTOX NOTOX NOTOX

WHERE NOTOX IS MADE
Glimpses of the Home of the World's Largest Makers of Hair Coloring

The exceptionally high standards which constitute the basis of leadership in any line of endeavor necessarily exist in the making of the one outstanding and scientific preparation for the hair. On these pages are shown a few of the tangible evidences of the thoroughness and efficiency that make NOTOX the supreme product.—The NOTOX building, the organic laboratory, the modern, scientifically conducted factory and the palatial salons.

The Notox Salons for demonstration and experimental work

The Notox Laboratory One of the most completely equipped in the world

The Notox Building at 33-35 West 46th Street New York, U. S. A.

One Step in Making Notox The most scrupulous cleanliness is rigidly maintained

[8] [9]

NOTOX NOTOX NOTOX NOTOX NOTOX NOTOX NOTOX NOTOX

NOTOX promotional and instructional booklet, 1924, “WHERE NOTOX IS MADE”¹¹⁶

“Glimpses of the Home of the World’s Largest Makers of Hair Coloring

The exceptionally high standards which constitute the basis of leadership in any line of endeavor necessarily exist in the making of the one outstanding and scientific preparation for the hair. On these pages are shown a few of the tangible evidences of the thoroughness and efficiency that make NOTOX the supreme product – The NOTOX building, the organic laboratory, the modern, scientifically conducted factory and the palatial salons.”

Inecto hair dye products were heavily marketed in women’s magazines through the 1920’s; in response to injury lawsuits, Inecto protested that they were the largest seller of hair dye, spending over \$300,000¹¹⁷ per year on advertising.¹¹⁸ Inecto sought to differentiate their product

¹¹⁵ David Hume, born 7 (May 7, 1711 – 25 August 1776) was a Scottish empirical philosopher, historian, economist, and essayist. He developed a system of empiricism, skepticism, and naturalism, placing him with other British empirical philosophers, John Locke, Francis Bacon and Thomas Hobbes.

¹¹⁶ Author’s private collection, Catherine Cartwright-Jones PhD

¹¹⁷ \$5,065,561.64 in 2018 US\$

¹¹⁸ ANNUAL REPORT OF THE FEDERAL TRADE COMMISSION FOR FISCAL YEAR ENDED JUNE 30, 1932 UNFAIR COMPETITION IN THE SALE OF HAIR DYE

from henna, compound henna, and progressive dyes. Their branding of NOTOX was an attempt to assure customers that their dye was scientific, safe, natural, and harmless. They appealed to issues of privacy and convenience, to assure women that their “secret” of having gray hair would not be revealed. The dye contents were undeclared and kept a corporate secret.

The text of Inecto’s advertisements appealed to women’s uneasiness about finding and keeping the affections of a mate in the post-war environment where hundreds and thousands of young men lost in WWI: there had been 116,516 American deaths and approximately 320,000 sick and wounded in the war, and greater casualties in Great Britain, causing a gender imbalance in the population. Would a woman remain single if their hair showed signs of aging? Would another woman steal the affections of a man? Inecto placed ads in movie magazines such as Photoplay, where women compared their ordinary lives to dramatic romantic relationships and tropes in motion pictures. If the women felt satisfying companionship lacking, Inecto suggested that loneliness could be remedied through hair dye.

PHOTOPLAY MAGAZINE—ADVERTISING SECTION 65



“Then come to mourn
the vanished hair.”
— Pope.

Beauty through Harmony

THE famous French physician-scientist, Dr. Emile of the Paris Faculty and Pasteur Institute, discovered the scientific coloring process

INECTO RAPID

Used for the last six years in 97% of the European Beauty Salons by Royalty and leaders of society and now adopted in the very best American Beauty Parlors from coast to coast.

In New York it is used exclusively in the Ritz-Carlton Hotel, Waldorf-Astoria, Biltmore, Plaza, Commodore, Pennsylvania and many others.

INECTO RAPID not only accomplishes beauty through harmonizing the hair with your individual characteristics but possesses superior features over anything hitherto known.

Permanently colors white, gray or faded hair regardless of cause in thirty minutes. Does not stain linens, brushes or hat linings. Is easy to use, has pleasant odor and is guaranteed harmless to hair or growth. Is not affected by shampooing, salt water, sunlight, rain, perspiration, permanent wave, Turkish or Russian Baths. Cannot be detected from nature's own coloring—not even under a microscope. Is packed in a new and very attractive manner which eliminates waste.

INECTO RAPID must not be confused with obsolete restorers, darkeners and ordinary gray hair lotions. It is a new, scientific process of impregnating the hair-shaft so that repigmentation takes place after nature's own method.

You can safely apply INECTO RAPID in the privacy of your own home if you so desire.

Send for full information and Harmony Analysis Chart—no cost or obligation.

INECTO, Inc. Laboratories: 818 Sixth Ave., New York
LONDON PARIS BRUSSELS MADRID MILAN

When you write to advertisers please mention PHOTOPLAY MAGAZINE.

Inecto Rapid advertisement, 1921, Photoplay Magazine¹¹⁹

The 1921 Photoplay Inecto Rapid advertisement played to women’s insecurities through imagery of wealth, fashion, science, and the promise of eternally youthful beauty through hair dye. The promotional, largely unverifiable text was as follows:

¹¹⁹ Author’s private collection, Catherine Cartwright-Jones, PhD

“INECTO RAPID

“Then cease to mourn thy ravished hair” Pope¹²⁰

Beauty through Harmony

“The famous French physician-scientist, Dr. Emile of the Paris Faculty and Pasteur Institute, discovered the scientific coloring process

INECTO RAPID

Gray Hair Banished in 30 Minutes

“Used for the last six years in 97% of the European Beauty Salons by Royalty and leaders of society and now adopted in the very best American Beauty Parlors from coast to coast.

“In New York, it is used exclusively in the Ritz-Carlton Hotel, Waldorf-Astoria, Biltmore, Plaza, Commodore, Pennsylvania and many others.

“INECTO RAPID not only accomplishes beauty through harmonizing the hair with your individual characteristics but possesses superior features over anything hitherto known.

“Permanently colors white, gray, or faded hair regardless of cause in thirty minutes. Does not stain linens, brushes or hat linings. Is easy to use, has pleasant odor is guaranteed harmless to hair growth. Is not affected by shampooing, salt water, sunlight, rain, perspiration, permanent wave, Turkish or Russian Baths. Cannot be detected from nature’s own coloring – not even under a microscope. Is packed in a new and very attractive manner which eliminates waste.

“INECTO RAPID must not be confused with obsolete restorers, darkeners and ordinary gray hair lotions. It is a new, scientific process of impregnating the hair shaft so that repigmentation takes place after nature’s own method.

“You can safely apply INECTO RAPID in the privacy of your own home if you so desire.

“Send for full information and Harmony Analysis Chart – no cost or obligation

INECTO Inc. Laboratories 818 Sixth Ave., New York

London Paris Brussels Madrid Milan

When you write to advertisers please mention Photoplay Magazine”¹²¹

Inecto was persuasive, appealing to working class women who dreamed of a glamor and wealth, and who were easily persuaded by misleading advertising. Inecto mentioned popular symbols of wealth and style, “In New York, it is used exclusively in the Ritz-Carlton Hotel, Waldorf-Astoria, Biltmore, Plaza, Commodore, Pennsylvania and many others,” and “Is not affected by permanent wave, Turkish or Russian Baths.”

¹²⁰ Pope, A. (1712) “The Rape of the Lock:” Canto 5

¹²¹ *Photoplay Magazine* was a magazine directed at movie fans from 1911 through the 1970’s.
<https://en.wikipedia.org/wiki/Photoplay>

Turkish and Russian Baths were luxurious, fashionable public facilities during the early 20th century, similar to a day spa during a period when private apartments and houses often had minimal plumbing. There was even a Turkish Bath for the upper class passengers on the Titanic. To state that a woman would be concerned about her hair dye running in a Turkish bath was to imply that she was wealthy enough to pay admission to a Turkish bath.



Left: Turkish Bath, London, built 1895.¹²²

Right: Turkish Bath on the Titanic, 1912.¹²³

Roher's cosmetology text in 1924 warns that any stylist ask for a guarantee that hair dye not contain para-phenylenediamine, as the Department of Health of the city of New York had issued a warning against the use of this chemical following numerous injuries.¹²⁴ Unfortunately, Inecto never declared para-phenylenediamine in their ingredients, even refusing to do so in the lawsuits brought by people who were injured by Inecto. The health department found that para-phenylenediamine was extensively used in hair dye, and that it produced reactions appearing similar to smallpox eruptions. The health department also warned against lead, arsenic, bismuth, and other dangerous additives to hair dye.

Following this, New York City passed an amendment to the Code of Ordinances (in 128, Article 8, Chapter 20, Sanitary Code in 1926 to prohibit the use of noxious chemicals in hair dyes and cosmetics. This law had little effect. Women wanted to color their hair, to emulate movie stars and to hide graying hair. Producers of hair dye wanted their money.

In February, 1928, Oscar Levin, MD, wrote a banner article for Good Housekeeping magazine, titled "Shall I Dye my Hair?"¹²⁵ This article followed a number of toxic poisonings in New York

¹²² Image by Lawford, H. (2009)

¹²³ Postcard in author's private collection: Catherine Cartwright-Jones, PhD, The Turkish Baths were an exclusive First Class Accommodation of the Titanic. They were located on F Deck between the Swimming Bath and the Third Class Dining Room. The baths were designed in a Moorish style with heating blankets and service waiters.

¹²⁴ (1924) *Roher's Illustrated Book on Scientific Modern Beauty Culture, of Hair-dyeing, Care of the Hair and Scalp, Facial Massage, Beautifying, Electrolysis and Manicuring, Etc.*, Prof. Rohrer's Institute of Beauty Culture, New York City, N. Y., p. 10

¹²⁵ "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.

City caused by hairdressers applying para-phenylenediamine dyes. Dr. Levin stated unequivocally that the only safe and effective dye for hair was henna. In his article for Good Housekeeping, Levin detailed cases of poisoning from the metallic salts in progressive and compound dyes, and went on to discuss the more serious problem of para-phenylenediamine dyes.

“Unfortunately, the second great class of dyes does not offer a safe and effective substitute for metallic dyes, either. These are the modern dyes, undreamed of through the centuries, when not a few of the metal dyes were used. These dyes are organic, synthetically prepared. They are obtained from aniline, a coal tar product, and a material widely used in the manufacture of dyes for general use. From the aniline is obtained the para-phenylenediamine, which is used as the base of all these synthetic dyes, of the brown-to-black shades, different from the metal preparations. The immediate results were so remarkable that the discovery was hailed as a glorious thing. For instead of merely coating the hair, which, of course, always made the dye more or less apparent, with the “varnished look” that is so unattractive, this new dye actually was absorbed by the hair shaft itself.¹²⁶

“Now then, the enthusiasm with which the discovery of this class of dyes was greeted is understandable. Actually, here was a product that penetrated the outer horny layer of the hair cells. The result looked natural. Moreover, the color was fairly permanent – what the chemists call a “fast” dye.

“The method of applying the dye is much the same as the metallic group. The para-phenylenediamine combines with oxygen, either from the air or from chemicals which yield oxygen easily, such as hydrogen peroxide or potassium chlorate. The chemical process of oxidation follows, and the brown or black color results, once again depending on the strength of the compound.

“However, the “great discovery” soon showed itself as a great source of danger. The first warnings about it came from the fur industry, where synthetic dyes were universally adopted. Here people were subjected to contact with the para-phenylenediamine over long periods. In a comparatively short time, workers in the industry came down with symptoms of poisoning resulting from these dyes. Symptoms such as persistent headache, nausea, vomiting, anemia, loss of weight, loss of appetite, and “fur dye asthma” were noted. Innumerable cases were brought to the attention of physicians, until measures had to be taken to protect the people. Cases are being constantly observed today in those who wear the cheaper dyed furs from which the excess dyes are not completely washed away.”

¹²⁶ Ibid, p.158 This probably refers to metallic progressive dyes which darkened the surface of hair when exposed to the air.

“Government Control is Difficult

“The German Government was among the first to pass a law necessitating the labeling of these dyes as poisonous, and all preparations containing them had to have their contents listed on the label, marked poisonous. Today, almost all European countries forbid their use, and now, with the adoption of the amendment to the Sanitary Code, New York City has taken the inevitable step against the use of these poisonous substances, specifically naming para-phenylenediamine.

“The difficulty here is two-fold. First, laws can be evaded, and no mention of the poisonous ingredient made on the label. Second, laws can be complied with, in the serene confidence that nine of ten buying such a hair dye and even reading the tiny lettering on the label, telling the presence of para-phenylenediamine, will not have the faintest idea of what the thing with the long name is, or that it is at all harmful.

“The symptoms of poisoning from the synthetic dyes are very much the same as those from the metallic ones. Likewise, some people show the toxic results quickly, while others do not for a long time. When the eruption finally does appear, there is the same itching, the same burning, swelling, and eczema, which may be recurrent.¹²⁷ This means that sometimes a person seems to be cured completely, the practice of dyeing the hair is abandoned, and yet at periodic intervals there is an exacerbation of the old eruption.¹²⁸

“Poisoning from para-phenylenediamine may be very severe as in the case of Mrs. X., who complained of an itching eruption which has been present for one week and covered the entire body. She had been referred to me by her oculist, who had been treating her eyes for an inflammation which had been present for one month. The patient stated that for one and a half years, in order to conceal some of her gray hairs, which had appeared at an early age, she had been using one of the famous preparations on the market. Applications were made once a month, regularly, the last having been made just prior to the onset of the inflammation of the eyes. The eruption of the skin appeared about three weeks later.

“Examination revealed a generalized eruption of the body, involving mainly the trunk, upper extremities, scalp and face. The eyes were red and inflamed; the forehead, swollen, puffy, and oozing. The scalp, ears, and back of neck considerably swollen, showed numberless small and large red blisters, many of which had ruptured and crusted. Scattered over the upper extremities and trunk were large patches of eczema. All over the body were similar groups of blisters. The blood pressure was slightly abnormal, and the patient complained of frequent urination, abdominal pains, and loss of weight.

¹²⁷ “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. p. 158

¹²⁸ Author’s note: if a person has a para-phenylenediamine sensitization, wearing clothing, leather, or using other products dyed with para-phenylenediamine or a related chemical can cause a recurrence of the allergic reaction. Though noted these recurrences were in medical reports, the connection with other uses of para-phenylenediamine was probably not understood at the time.

“She immediately was cautioned against ever using the preparation again. A very bland diet, eliminating spices, salt, pepper, and rich foods, was prescribed. In addition she had to take large quantities of water internally to cleanse the system more rapidly of the poison. On occasions the itching was so intense that the patient was unable to sleep without the use of hypnotics. One week after treatment was commenced; she began to show boils over the body. This was due to the fact that the resistance of the skin, lowered by the severe inflammation, provided a fertile field for infection by the ordinary bacteria and germs usually found in the air and on the skin.

“This patient went through a long siege of eczema and boils, which finally cleared up, after much treatment both at home and in the office. But, it left her run-down, anemic, underweight, and she was obliged to go to the country for a long rest.

This representative case of “para” poisoning shows what may happen from this use of this heralded “new discovery.” It shows that in this second class of hair dyes is involved a real danger, varying only with the susceptibility of the individual.”¹²⁹

The remarkable thing about Oscar Levin’s hair dye warnings is that the injuriousness of para-phenylenediamine was well understood in the 1920’s, both from industrial use, and through injuries from cosmetic use, but L’Oreal, Inecto, and other cosmetic companies had little reluctance to sell products containing coal tar dyes.¹³⁰ DuPont, the patent holder, “does not recommend and will not knowingly offer or sell p-phenylenediamine (PPD) for uses involving prolonged skin contact. ... use of PPD in prolonged skin contact application has the potential to induce allergic skin reactions in sensitive individuals. Persons proposing to use PPD in any formulation involving any more than incidental skin contact must rely on their own medical and legal judgment without any representation on our part. They must accept full responsibility for the safety and effectiveness of their formulations.”¹³¹ That is to say, that if injuries arise from any person or company adding para-phenylenediamine to their product, the patent holder, DuPont, will accept no responsibility for the injury.

The contact allergic reactions from p-phenylenediamine (PPD) in hair dyes vary from mild contact dermatitis to severe life- threatening events (angioedema, bronchospasm, asthma, renal impairment).¹³²

¹²⁹ “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. P. 161

¹³⁰ Pratchett, T., (2010) “What was it that Granny Weatherwax had said once? ‘Evil starts when you begin to treat people as things.’” *I Shall Wear Midnight* Discworld Novel 38. Doubleday

¹³¹ Du Pont p-Phenylenediamine Product description
http://www2.dupont.com/Products/en_RU/P_phenylenediamine_en.html

¹³² Gupta, M., Mahajan, V., Mehta, K., and Chauhan, P. (2015) Hair dye dermatitis and p-phenylenediamine contact sensitivity: A preliminary report” *Indian Dermatology Online J.* 2015 Jul-Aug; 6(4): 241–246.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4513401/> accessed March 29, 2018

Inecto Rapid Notox: Para-phenylenediamine Hair Dye

Inecto, Inc. was established in 1919 by Neal R. Andrews to bring the hair dye Inecto Rapid to the United States from the UK and Europe. By 1924, Inecto Rapid Notox was widely advertised and promoted in hair salons as a harmless and convenient hair dye.



**INECTO
RAPID
NOTOX**

Gray Hair Banished in 15 minutes

Hundreds of thousands of American women are regaining the youthful glory of their hair by using INECTO RAPID NOTOX. And the success of these is guiding thousands more to use this, the one tint that is perfectly natural and perfectly safe. INECTO RAPID NOTOX is a strictly scientific hair tint. It conforms with the most exacting laboratory standards. It is specifically guaranteed to impart to gray, streaked or faded hair all its former harmonious beauty of lustre, of silken texture and shade. Its use cannot be detected. It is guaranteed permanent; its coloring will withstand any condition or treatment that Nature's will—brushing, rubbing, shampooing, sunshine, salt water, perspiration, Turkish and Russian baths, permanent waving, marceling and curling.

The majority of high class hairdressers, from coast to coast use and recommend it. It is safe, it cannot injure texture or growth. It contains no Paraphenylene Diamine. The ease of application enables anyone to apply it with invariable success, in the privacy of the home.

You can obtain INECTO RAPID NOTOX at your Beauty Shop or Hairdresser's or at the best Drug and Department Stores.

If you are concerned about your hair, Jeanne Ruere, expert of the greatest hair coloring manufacturers in the world, is ready to give you confidential advice on your particular problem.

SEND NO MONEY. Merely drop a card to Inecto, Inc., asking for Beauty Analysis Chart, M 23—which will enable you to select unerringly the shade precisely suited to you.

INECTO, Inc., Laboratories and Salons, 33-35 West 46th Street, New York
HAROLD F. RITCHIE & CO., Inc., 171 Madison Avenue, New York

Inecto Rapid Notox hair dye advertisement, USA, 1925, Picture Play Magazine¹³³

Advertising text from Inecto Rapid Notox from “Picture Play” magazine, 1925:

“Gray Hair Banished in 15 Minutes

“Hundreds of thousands of American women are regaining the youthful glory of their hair by using INECTO RAPID NOTOX.

¹³³ Author's private collection, Catherine Cartwright-Jones PhD

“And the success of these is guiding thousands more to use this, the one tint that is perfectly natural and perfectly safe.¹³⁴

“INECTO RAPID NOTOX is a strictly scientific hair tint. It conforms with the most exacting laboratory standards.

“It is specifically guaranteed to impart to gray, streaked or faded hair and all its former harmonious beauty of lustre, of silken texture and shade. Its use cannot be detected. It is guaranteed permanent; its coloring will withstand any condition or treatment that Nature’s will – brushing, rubbing, shampooing, sunshine, salt water, perspiration, Turkish and Russian baths, permanent waving, marceling and curling.

“The majority of high class hairdressers, from coast to coast use and recommend it. It is safe, it cannot injure texture or growth. It contains no Paraphenylene Diamine.¹³⁵ The ease of application enables anyone to apply it with invariable success, in the privacy of the home.

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“SEND NO MONEY. Merely drop a card to Inecto, Inc., asking for Beauty Analysis Chart M 23 – which will enable you to select unerringly the shade precisely suited to you.

INECTO, Inc., Laboratories and Salons, 33 – 35 West 46th Street, New York
HAROLD F. RITCHIE & CO.¹³⁶ Inc. 171 Madison Avenue, New York

¹³⁴ Inecto Rapid Notox was not safe: it contained undeclared para-phenylenediamine and other coal tar dyes, and was sued many times for injuries to clients.

¹³⁵ This is false and misleading statement. Inecto Rapid Notox contained para-phenylenediamine.

¹³⁶ Harold F. Ritchie died in 1933, claiming the title “World’s Greatest Salesman.”

“Last week Death came to a squeaky-voiced Canadian named Harold F. Ritchie as he lay on a Toronto operating table. His name is not found on many rosters of the business great, yet he had good claim to the proud title of "World's Greatest Salesman." His Harold F. Ritchie & Co., Ltd. is a globe-embracing network of sales agencies through which such commodities as Rubberset brushes, Tanglefoot fly paper, Glover's Mange Cure and Fralinger's Salt Water Taffy have been broadcast over six continents.” Time Magazine, Monday, March 6, 1933

“Harold F. Ritchie & Co Ltd were manufacturing agents. So while they didn’t actually manufacture anything, they sold practically everything under the sun. This was a fairly new concept at the time as salesmen generally traveled around pushing just one product.” ... Before long he had earned the nickname “Carload” Ritchie and was described as a “doctor of salesmanship.” Taylor, K., July 30, 2015., 14 McCaul St. and Harold “Carload Ritchie” *One Gal’s Toronto*
<https://onegalstoronto.wordpress.com/2015/07/30/14-mccaul-st-and-harold-carload-ritchie/>

In Britain, Inecto placed similar advertising in women’s magazines, with some cultural adjustment to the audience. The UK had suffered tremendous troupe losses in WWI,¹³⁷ which put British women in intense competition with each other to find a husband. The advertisement again implied that if a woman had begun to gray, she could dye her hair in secret to appear more youthful, thus be more competitive with other women in securing a mate.



Inecto Rapid advertisement from 1925, “Her Secret” from “The Sketch,” a woman’s magazine based in London.

The text of the advertisement from “The Sketch”:

“Her Secret is her own, for hair that is re-coloured with INECTO never betrays that fact. The colour restored is positively permanent and unchanging under all conditions. The

¹³⁷ Of 8,904 forces mobilized from the British Empire for WWI, 908,371 were killed, 2,090,212 were wounded, 191,652 were prisoners or missing, with a total of 3,190,235 casualties, or 35% of all troops. Source: Encyclopedia Britannica.

fiercest sun will never bleach it; the longest sequence of Turkish or Vapour baths can never cause it to “run.”¹³⁸

“For this and other equally important reasons, INECTO is the only means of hair recolouration the woman of refinement can adopt without misgiving. It is quite impossible for hair recoloured with INECTO to take on that dead-looking, hard, metallic appearance inseparable from the use of evil-smelling hair “paints” and so-called progressive dyes.¹³⁹

“With INECTO there is no odour¹⁴⁰ and no waiting period for the color to “develop.”¹⁴¹ One brief sitting of thirty minutes or less is enough to effect the transformation from greyness and age to glorious colour and a fascinating appearance of youthfulness. The recapturing of a youthful appearance is aided by the fact that INECTO greatly improves the natural softness, sheen and elasticity of the hair, making it far easier to dress becomingly.

Ask your hairdresser why, in company with 90 per cent of leading Salons, he uses and recommends INECTO. Alternatively, write for a little booklet (gratis and post-free, of course) telling how INECTO can be self-applied in the privacy of your own home. Provided the simple directions are followed, a wholly satisfactory result is assured.

INECTO RAPID
ADVICE BUREAU,
15, NORTH AUDLEY STREET,
(Near Selfridges), LONDON, W.I.
Telephones: Mayfair 3046 (3 lines).

Inecto Notox produced a promotional booklet of instructions for their hair dye. Most of the booklet was occupied by application instructions and warnings about applying the dye over what seem to have been compound henna and metallic progressive dyes. The introductory pages speak of “reclaiming youthful glory” and refer to hair graying as a disease.

“HOW TO APPLY NOTOX

“Your mirrored reflection best bespeaks the incomparable beauty of a NOTOX application.

¹³⁸ This is a reference to henna. Superficial lawsone, not completely bound into keratin, may rinse out for the first few shampoos or from steam or perspiration.

¹³⁹ This refers to “hair restorers” and progressive dyes which darkened the hair through repeated applications of lead acetate or other mineral salts.

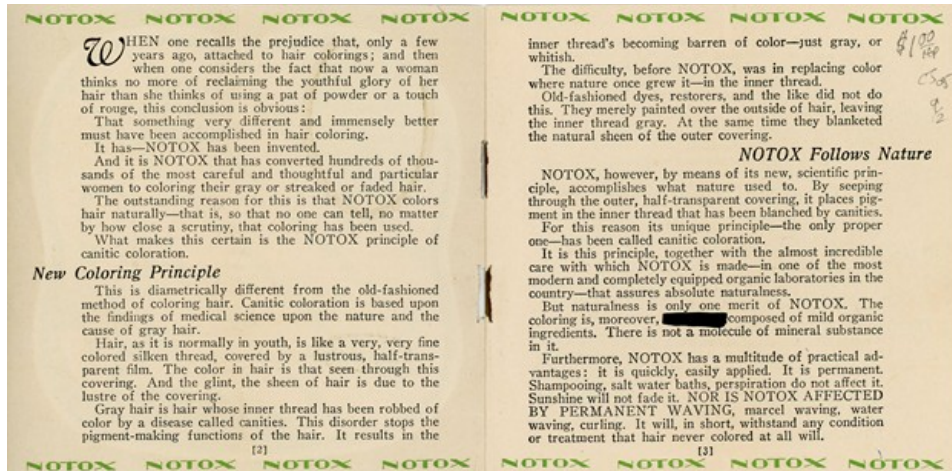
¹⁴⁰ Yes, henna does have a distinctive odor.

¹⁴¹ This may refer to either henna or metallic progressive dyes. A henna pack requires several hours for the aglycone to migrate from the henna to the keratin and bind. Progressive dyes require multiple applications of the metallic salt to gradually darken the hair.

“when one recalls the prejudice that, only a few years ago, attached to hair colorings; and then when one considers the fact that now a woman thinks no more of reclaiming the youthful glory of her hair than she thinks of using a pat of powder or a touch of rouge, this conclusion is obvious:

“That something very different and immensely better must have been accomplished in hair coloring.

“It has – NOTOX has been invented.



Promotional booklet and package insert of Inecto Notox, late 1920's

“And it is NOTOX that has that has converted hundreds of thousands of the most careful and thoughtful and particular women to coloring their gray or streaked or faded hair.

“The outstanding reason for this is that NOTOX colors hair naturally – that is, so no one can tell, no matter by how close a scrutiny, that coloring has been used.

“What makes this certain is the NOTOX principle of canitic coloration.

“New coloring Principle

“This is diametrically different from the old-fashioned method of coloring hair. Canitic coloration is based on the findings of medical science upon the nature and cause of gray hair.

“Hair, as it is normally in youth, is like a very, very fine colored silken thread, covered by a lustrous, half-transparent film. The color in hair is that seen through this covering. And the glint, the sheen of hair is due to the lustre of the covering.

“Gray hair is hair whose inner thread has been robbed of color by a disease called canities.¹⁴² This disorder stops the pigment-making functions of the hair.¹⁴³ It results in the inner thread’s becoming barren of color – just gray or whitish.

“Old-fashioned dyes, restorers, and the like did not do this. They merely painted over the outside of the hair, leaving the inner thread gray. At the same time they blanketed the natural sheen of the outer covering.

“NOTOX Follows Nature

“NOTOX, however, by means of its new, scientific principle, accomplishes what nature used to. By seeping through the outer, half-transparent covering, it places pigment in the inner thread that has been breached by canities.

“For this reason its unique principle – the only proper one – has been called canitic coloration.

“It is this principle, together with the most incredible care with which NOTOX is made – in one of the most modern and completely equipped organic laboratories in the country – that assures absolute naturalness.

“But naturalness is only one merit of NOTOX. The coloring is, moreover [word obscured by ink] composed of mild organic ingredients. There is not a molecule of mineral substance in it.¹⁴⁴

“... (NOTOX) is more than the best coloring: it is the one coloring.”

¹⁴² Canities, noun, is from the Latin word for ‘gray hair or old age’, (genitive cānitīē); fifth declension).

¹⁴³ Authors note: the body’s reduction in producing pigmentation in the core of hair is neither a disease, nor a disorder. It is a function of maturation, largely controlled by heredity and possibly accelerated by smoking.

¹⁴⁴ This comment refers to progressive dyes, which used metallic salts, particularly lead acetate, to dye hair.



*For a smart woman
Heartbreak Age begins with her first gray hair
and ends when she finds NOTOX*

YOU know—every woman knows—the deep little ache that comes when you think that your youth is slipping away. You are *young*, until one day you see a first gray hair. And the sight of it makes you feel suddenly that heartbreak age has begun for you.

A nice woman shrinks from the thought of using the kind of hair dye that coats the hair on the outside. It looks so artificial. And seems so crude and cheap in these modern days. But Notox is not that kind of hair-coloring agent.

Inecto Rapid Notox is as modern as calories and vitamins. It is as different in its method of coloring faded or gray hair, as inoculation is different from wearing a rabbit's foot to prevent disease. Modern scientists have shown that gray hair is a disease, called "canities," characterized by an exhaustion of the coloring matter in the hair. And Notox was developed, in a modern

research laboratory, to replace the coloring *inside* the hair, where nature had it. The result is that a Notox treatment leaves your hair with its own sheen, its own lively variation of high-lights and shadows in its mass, its own youthful luster on every hair surface. Heartbreak age will end for you when you have your first Notox treatment.

There are 18 distinct shades of Inecto Rapid Notox, a complete range to reproduce every gradation of natural coloring for the hair. Notox is permanent; it is not affected by shampooing, marcelling, permanent waving, sunlight, salt or fresh water, steam baths or perspiration.

The best beauty shops use Inecto Rapid Notox; ask for a Notox treatment when you make your beauty shop appointment. Or you may use it at home; it is on sale at beauty shops, drug stores and department stores everywhere.

Mfg. by INECTO, INC., 33 W. 46th St., N. Y. C. and Notox, Ltd., 10 McCaul St., Toronto, Can.—Sales Rep., Harold F. Ritchie & Co., Inc., N. Y.

NOTOX

Woman's Home Companion April 1928

Advertisement for Inecto Notox, April 1928, Women's Home Companion

The advertising text for Inecto Notox, April 1928, "Women's Home Companion" continued to play on women's insecurities related to loss of youth, and the need to keep one's age a secret, the longing for a refined and sophisticated life. This strategy must have been effective because it is a recurring theme in Notox advertising. This ad implies that gray hair is "Heartbreak," perhaps intending to resonate with the vulnerabilities of women suffering from anxiety and depression:

"For a smart woman
Heartbreak Age begins with her first gray hair
And ends when she finds NOTOX

"You know – every woman knows – the deep little ache that comes when you think that your youth is slipping away. You are *young*, until one day when you see a first gray hair. And the sight of it makes you feel suddenly that heartbreak age has begun for you.

“A nice woman shrinks from the thought of using the kind of hair dye that coats the hair on the outside. It looks so artificial. And seems so crude and cheap in these modern days. But Notox is not that kind of hair-coloring agent.

“Inecto rapid Notox is as modern as calories and vitamins. It is as different in its method of coloring faded or gray hair, as inoculation is different from wearing a rabbit’s foot to prevent disease. Modern scientists have shown that gray hair is a disease, caused “canities” characterized by an exhaustion of the coloring matter in the hair. And Notox was developed, in a modern research laboratory, to replace the coloring *inside* the hair, where nature had it. The result is that a Notox treatment leaves your hair with its own sheen, its own lively variation of high-lights and shadows in its mass, its own youthful luster on every hair surface. Heartbreak age will end for you when you have your first Notox treatment.

“There are 18 distinct shades of Inecto Rapid Notox, a complete range to reproduce every gradation of natural coloring for the hair. Notox is permanent; it is not affected by shampooing, marcelling, permanent waving, sunlight, salt or fresh water, steam baths or perspiration.

“The best beauty shops use Inecto Rapid Notox; ask for a Notox treatment when you make your beauty shop appointment. Or you may use it at home; it is on sale at beauty shops, drug stores and department stores everywhere.

“Mfd. By Inecto, Inc. 33 w. 46th St. N.Y.C., and Notox Ltd, 10 McCaul St., Toronto, Can.
– Sales Rep., Harold f. Ritchie & Co., Inc., N.Y.
NOTOX”

Legal Action Against Inecto Rapid Notox for Injuries Caused by Para-phenylenediamine

Inecto Notox Rapid was promoted in the USA from 1924. The first recorded injury caused by Inecto Rapid Notox occurred on March 31st, 1924, when drips of the dye got on a hairdresser’s finger and immediately stained the skin black. Twelve hours after black dye stained her skin, a severe hypersensitivity reaction began. “That night at two o'clock the plaintiff awoke. Her finger was red, swollen, and painful. She called a doctor. The finger grew worse. Several operations were performed on it. The plaintiff has never regained the full use of the finger.”

This injury was certainly caused by unacknowledged para-phenylenediamine and other coal tar derivatives in Inecto black hair dye, and Pauline Karr sued Inecto Inc. in court in 1926.¹⁴⁵ The initial judgement was that “the user’s evidence was sufficient to make out a prima facie case.

¹⁴⁵ Pauline Karr, v. Inecto, Inc.: The initial judgement was that “the user’s evidence was sufficient to make out a prima facie case.”

On appeal, Inecto¹⁴⁶ was able to successfully argue that Karr could not prove the black stain and injury was caused by their product.¹⁴⁷ Despite winning on appeal and often arguing their innocence on the same basis of insufficient proximate evidence, dozens more injury suits followed until Inecto was eventually forced out of the hair dye business in the USA.

Inecto's defense in *Karr v. Inecto, Inc.*, 220 App. Div. 621., set a precedent for the dismissal of injury lawsuits caused by corporations for the next ninety years. A summary of the sequence is as follows:

1. A person suffered injury or death after using a product, and believed that the product caused the injury/death.
2. The corporation impugns the victim personally and states that their claims are not to be taken seriously.
3. The corporation claims that the victim cannot prove that the product caused the injury/death.
4. The corporation claims that many other clients are unharmed, so that if there was an injury, the victim must have used their product incorrectly.
5. The corporation claims that their formula is a trade secret that they cannot divulge.
6. The corporation claims that they are so popular, so large, and so widely purchased that their products must be harmless.

This defense tactic has been used successfully by hundreds of other cosmetic, food, and dye companies as well as tobacco and other products where there is a time lapse between use and evidence of injury. In the case of para-phenylenediamine, dose-time relationships and the delayed hypersensitivity reaction¹⁴⁸ always played in the corporations' favor: it was difficult to prove in a court of law direct cause and effect.

Pauline Falk's suit against Inecto Rapid Notox was one of the few that was settled in favor of the plaintiff in particular, and the protection of public health in general. July 30th, 1926, plaintiff, Pauline Falk visited the beauty parlor conducted by Lillian Wall, "Miss Lillie," who ran Lillie Beauty Parlor at No. 994 Amsterdam Ave, Borough of Manhattan, City and State of New York. "Miss Lillie" applied Inecto Rapid Notox to dye Pauline's hair. Pauline suffered intense itching

¹⁴⁶ Pauline Karr, Respondent, v. Inecto, Inc., Appellant, Court of Appeals of New York, 247 N.Y. 360; 160 N.E. 398; 1928 N.Y. LEXIS 1080, January 12, 1928, Argued, February 14, 1928, Decided

¹⁴⁷ The manufacturer argued that evidence in the record did not warrant the inference that the hair dye it manufactured was the proximate cause of the injuries suffered by the user. The court reversed the appellate court's judgment. The court found no direct evidence of the nature of the dye and noted that it was being asked to draw the inference that the chemical poison which was said to have caused injury to the user was contained in the manufacturer's chemical product merely because an injury occurred on the finger which was stained by the dye 12 hours before, though possibility of other cause was not excluded and there was no direct evidence that the chemical product contained any chemical poison. The court also noted that it was being asked to find that the dye not only caused the injury but was so inherently dangerous that the manufacturer was negligent when it put the bottle on the market though dye from exactly the same bottle produced no harmful effect upon another person. The court concluded that the evidence did not sustain such inferences.

¹⁴⁸ Hextall, J. M., Alagaratnam, N. J., Glendinning, A. K., Holloway, D. B., Blaikie, L., Basketter, D. A., McFadden, J. P., (2002) "Dose-time relationships for elicitation of contact allergy to para-phenylenediamine" *Contact Dermatitis* 6 November 2002

and pain all over her body, and her eyelids became painful and swollen, which she attributed to the chemicals in Notox hair dye.

Pauline Falk commenced legal action against Inecto Rapid Notox and the hairdresser in August 2, 1927 for compensation for injuries. Plaintiff Falk claimed¹⁴⁹ that “the chemical product known as Inecto Rapid (Notox) ... was inherently dangerous and poisonous to the skin and scalp.”¹⁵⁰ “The ... defendant corporation was careless, negligent and reckless in manufacturing and/or in putting upon the market a dangerous and poisonous product and in representing to the public that the said product aforesaid may be used as a hair dye and applied to the head.” “The admitted manufacturer of a hair dye known as NOTOX was negligent in putting chemicals inherently dangerous and poisonous into the hair dye and selling the hair dye to the public as a safe hair dye for normal people, and that the plaintiff suffered personal injuries by the use of the hair dye, for which damages in the sum of Ten thousand Dollars (\$10,000)¹⁵¹ are demanded.”¹⁵²

Inecto’s lawyers, having defended a previous injury claim,¹⁵³ countered that they were so large a corporation that they could not be harming anybody, and that they did not have to be compelled to declare their ingredients; to do so would compromise their business. “The product of the defendant is sold, of course, upon a highly competitive market,” “their product has succeeded in this competition because it has by a method of its own succeeded in introducing a product free from the dangers attendant upon the use of numerous other hair dyes. This achievement is secret and the defendant’s business depends upon maintaining the secret.”¹⁵⁴

¹⁴⁹ SUPREME COURT APPELLATE DIVISION—New York City, New York, Supreme Court, Appellate Division – First Department. Pauline Falk, Against Inecto, Inc., and Lillian Wall. DANIEL A. SHIRK, Attorney for Plaintiff-Appellant, No. 225 Broadway, New York City. HULBERT & HEERMANCE, Attorneys for Defendant-Respondent, No. 551 Fifth Avenue, New York City. The Court Press. Inc. in google digitized document. Supreme Court Appellate Division-First Department. From Google Digitized document <https://books.google.com/books?id=OrJPvEkh3ZkC&pg=RA1-PA54&lpg=RA1-PA54&dq> (accessed March 25, 2018)

¹⁵⁰ PAPERS ON APPEAL FROM TWO ORDERS, Granting Defendant’s Motions to Extend Time of Defendant Inecto, Inc., to Move Under Rules 102 and 103 After Issue Joined and Striking Out Paragraphs 6 to 26 Inclusive from the Amended Complaint, ON THE GROUND THAT SAID ALLEGATIONS ARE EVIDENTIARY. New York City. New York Supreme Court, Appellate Division – First Department. Pauline Falk, Against – Inecto, Inc., and Lillian Wall. DANIEL A. SHIRK, Attorney for Plaintiff-Appellant, No. 225 Broadway, New York City. HULBERT & HEERMANCE, Attorneys for Defendant-Respondent, No. 551 Fifth Avenue, New York City. THE Court Press. Inc. pages 154 –p 265. Google Digitized document <https://books.google.com/books?id=OrJPvEkh3ZkC&pg=RA1-PA54&lpg=RA1-PA54&dq> (accessed March 25, 2018)

¹⁵¹ \$142,499.42 in 2018 \$USD

¹⁵² PAPERS ON APPEAL FROM TWO ORDERS, Granting Defendant’s Motions to Extend Time of Defendant Inecto, Inc., to Move Under Rules 102 and 103 After Issue Joined and Striking Out Paragraphs 6 to 26 Inclusive from the Amended Complaint, ON THE GROUND THAT SAID ALLEGATIONS ARE EVIDENTIARY. New York City. New York Supreme Court, Appellate Division – First Department. Pauline Falk, Against – Inecto, Inc., and Lillian Wall. DANIEL A. SHIRK, Attorney for Plaintiff-Appellant, No. 225 Broadway, New York City. HULBERT & HEERMANCE, Attorneys for Defendant-Respondent, No. 551 Fifth Avenue, New York City. THE Court Press. Inc. page 168

¹⁵³ Under the decision in the Court of Appeals in a previous injury suit against Inecto, *Karr v. Inecto, Inc.*, 247 N. Y. 360, the plaintiff was required to show “by direct or circumstantial evidence at least that the bottles of dye manufactured by the defendant and used by the plaintiff contained a. poisonous and dangerous liquid.”

¹⁵⁴ *Ibid*, p.172

Inecto's lawyers claimed that the victim's claims could not be taken seriously because, "The plaintiff not being a chemist and familiar with the manufacture of hair dye, her allegations with respect to the chemical composition of hair dye must not only necessarily, but honestly be on information and belief."¹⁵⁵ That is to say Inecto's lawyers alleged that the plaintiff's claims could be taken seriously, because she was not a chemist. Her lawyer, Daniel Shirk, however, did have a degree in chemistry. Mr. Neal R. Andrews, the President of the defendant corporation, was not chemist or familiar with the chemistry of hair dyes. Deponent was informed that Mr. Andrews was an advertising man with no chemical or scientific training.¹⁵⁶

Inecto's lawyers further objected to being responsible for Falk's injuries because it was possible that their product had been improperly mixed¹⁵⁷ or that she had a bad bottle of the product, and that she could not prove what might have been in the bottle because the contents had been used up.¹⁵⁸

Though the defendant corporation offered Inecto Rapid (Notox) for general sale claimed that it was a safe hair dye, the product was "inherently dangerous and poisonous to the skin and scalp."¹⁵⁹ Shirk stated that Inecto Rapid, Notox contained, among other ingredients, paraphenylenediamine, meta-diamino anisole, ortho amino-phenol, para amino phenol, para methyl amino phenol sulphate, para amino di phenylene amine, para tolulene diamine, meta-diamino anisole, meta-diamino phenetole, and "That on information and belief defendant corporation was careless, negligent and reckless in manufacturing and/or in putting upon the market a dangerous and poisonous product and in representing to the public that the said product aforesaid may be used as a hair dye and applied to the head."

The attorney for the plaintiff stated that Inecto Rapid Notox permanently disabled Pauline Falk, and that the company was at fault for presenting the hair dye as harmless. Notox was "was careless, negligent and reckless in manufacturing and/or in putting upon the market a dangerous and poisonous product and in representing to the public that the said product aforesaid may be used as a hair dye and applied to the head."

Shirk, the attorney for the plaintiff stated,

"... when this plaintiff had the product of the defendant corporation applied to the hair on her head as aforesaid, the said chemical product Inecto Rapid Notox, when so applied, caused intense itching of the head and body of the plaintiff; caused the eyelids of the plaintiff to grow inflamed and swollen; caused the plaintiff to become sick, sore and disabled, and to suffer from rashes and burns and other physical pains; caused the plaintiff to be unable to attend to her regular course of duties, and upon information and belief, some of the injuries received by plaintiff as aforesaid, are of "a permanent nature." That the foregoing injuries were caused solely and exclusively by reason of the carelessness, recklessness and negligence of the defendant corporation as aforesaid, and

¹⁵⁵ Ibid, p. 206

¹⁵⁶ Ibid, p. 207

¹⁵⁷ Ibid, p. 203

¹⁵⁸ Ibid, p. 204

¹⁵⁹ Ibid, p. 208-13

without any negligence on the part of the plaintiff contributing thereto. That by reason of the foregoing, the plaintiff has been damaged in the sum of Ten Thousand (\$10,000) Dollars.”¹⁶⁰

“If I may be permitted to use the word adopted by the defendant’s president, in the defendant’s position, is in the fact that it seeks refuge from manufacturing a hair dye which deponent verily believes contains highly poisonous chemicals, inherently dangerous. The defendant seeks under the guise of secrecy, to prevent its product from being exposed to the Courts of this state. I hope no Court shall ever say that a person, firm or corporation, shall under the cloak of secrecy, be permitted to manufacture a product containing dangerous and poisonous substances affecting the health of a great portion of our people.”¹⁶¹

The Appellant’s Brief statement, argued by Daniel Shirk, declared that Defendant Inecto, Inc. should be ruled guilty of inexcusable laches and bad faith,¹⁶² and that Inecto be required to disclose injuries caused by their product, noxious chemicals in their product, and not be allowed to circumvent the Code of Ordinances, 128, Article 8, Chapter 20, Sanitary Code through claims of corporate secrecy.

According to the Annual report of the Federal Trade Commission for Fiscal Year Ended June 30, 1932 United States Government Printing Office, Washington, 1932, Inecto Notox was required to withdraw from the State of New York, and to file with the Secretary of State its certificate surrendering its authority to do business here, pursuant to section 216 of the General Corporation Law. The defendant sold and disposed of its business and assets in New York.

“ANNUAL REPORT OF THE FEDERAL TRADE COMMISSION FOR FISCAL
YEAR ENDED JUNE 30, 1932
UNFAIR COMPETITION IN THE SALE OF HAIR DYE:

“Inecto (Inc.), New York.—The order to cease and desist issued against this corporation prohibits the use of False and deceptive representations in promoting and effecting the interstate sale and distribution of a hair dye or hair or hair coloring manufactured by the company and designated “Inecto Rapid Notox.” Represented to be the largest manufacturer of hair coloring in the world, the respondent promoted the sale of the product, national advertising expenditures running at times as high as \$300,000 a year. The dye was sold for home use through drug stores, department stores, hairdressing establishments and other dealers, direct by mail order. It was also sold for use by beauty parlors and hairdressers throughout the country for the treatment or coloring of the hair of their patrons.

“In addition to applying the word “Notox” to the product, the respondent promoted its purchase and use by the trade and consuming public on numerous representations to the effect that the dye is nontoxic, safe, and harmless without any poisonous or toxic

¹⁶⁰ Ibid p. 214

¹⁶¹ Ibid p.178

¹⁶² Ibid p. 232

ingredients and that it will not produce or cause any harmful or deleterious effects upon the body' and that no instances of harmful or deleterious effects have arisen or been reported.

“After trial and hearing the commission entered findings of fact covering the case, it found that such representations were false, misleading, and deceptive and that the dye is in fact a dangerously toxic, deleterious, and harmful product containing a toxic dye base and poisonous and injurious ingredients or properties’ that in its use and application harmful to dyeing or coloring of the human hair it is not safe or harmless and that in many instances it has caused and produced toxic, deleterious, and harmful physical effects upon the Scalp and other parts of the body of users, including irritation and toxic poisoning of the scalp. The corporation also disseminated as trade promotional literature a large number of testimonials or endorsements purporting to be written statements by users or patrons praising and commending the respondent’s brand of hair dye. Upon the evidence, the commission found that practically all of such testimonials or endorsements were false and as used by the respondent had the capacity and tendency to mislead and deceive the purchasing public into the erroneous believe that they were genuine unsolicited testimonials or endorsements of its brand of hair dye received by respondent from patrons or users thereof. The commission also found that the tendency and effect of the false and deceptive practices of the corporation were to injure the public and the business of the competitors; and that such misrepresentations operated as an unfair competitive advantage to the corporation and a detriment to and burden upon the legitimate hair-dye manufacturing and marketing industry in this country. Upon concluding that the practices constituted an unfair method of competition in violation of the statute, the false representations were prohibited in the order to cease and desist (Commissioner Humphrey dissenting).”¹⁶³

Inecto Notox did not cease operations during the injury lawsuits. Injuries continued, as were filed in *Simons v. Inecto, Inc.* “On December 16, 1931, the plaintiff purchased a quantity of Inecto Notox from a merchant in California, for the purpose of applying it to the hair of other persons in the conduct of her business, as well as to her own hair. The complaint alleges that Inecto Notox is a chemical substance containing ingredients improperly mixed, and which, when so mixed, are dangerous and poisonous to the human body when applied thereto; and that she applied it to her own hair, and as a result of such use was poisoned and injured, through the negligence of the defendant.”¹⁶⁴

Inecto left New York where the Sanitary Code was in effect and relocated in California, resuming business, without acknowledging the use of para-phenylenediamine in its formula, though with some cautionary warnings on the packaging. By the ruling of November 2, 1934, FDA could not take action against a coal-tar hair dye, as long as the label included a special

¹⁶³ ANNUAL REPORT OF THE FEDERAL TRADE COMMISSION FOR FISCAL YEAR ENDED JUNE 30, 1932. UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON Page 84 – 5
http://www.casewatch.org/ftc/annual_reports/1932.pdf

¹⁶⁴ Appellate Division of the Supreme Court of New York, Third Department. 242 App. Div. 275 (N.Y. App. Div. 1934) *JESSIE SIMONS, Respondent, v. INECTO, INC., Appellant*. Appellate Division of the Supreme Court of New York, Third Department.”

caution statement and the product comes with adequate directions for consumers to do a skin test before they dye their hair. The caution statement is as follows:

“Caution – This product contains ingredients which may cause skin irritation on certain individuals and a preliminary test according to accompanying directions should first be made. This product must not be used for dyeing the eyelashes or eyebrows; to do so may cause blindness. (FD&C Act, 601(a))

“FDA may take action if a harmful coal-tar hair dye product if— it does not have the caution statement on its label or come with adequate directions for a skin test, or an ingredient other than the coal-tar hair dye itself is harmful.

Inecto’s new packaging removed the word Notox, and included the required warnings.



Package, contents and insert of Inecto hair dye, mid-1930’s.

Though pure para-phenylenediamine is clear, the liquid or solid dye darkens with exposure to oxygen, as seen in spillage on the package insert.



Revised Inecto package and contents after the courts ruled that the word “Notox” was false, misleading, and deceptive and that the dye is in fact a dangerously toxic, deleterious, and harmful product containing a toxic dye base and poisonous and injurious ingredients in 1932.



The text on the package produced after 1934, in accordance with updated FDA regulations stated:

“Caution: this product contains ingredients which may cause skin irritations in certain individuals and a preliminary test according to accompanying directions should first be made. This product must not be used for dyeing the eyelashes or eyebrows; to do so may cause blindness. Read directions carefully. Contents 4 fl. Ozs. Distributed by Sales Affiliates, Inc. New York City.”

The FDA Regulates Henna and Para-Phenylenediamine

Cosmetics and medical devices were overseen by the Post Office Department and the Federal Trade Commission prior to 1938, came under FDA authority after 1938. The 1938 act required colors in food, medicine, cosmetics, and hair dye to be certified as harmless and suitable by the FDA. Pure henna (*lawsonia inermis*) was deemed so completely safe as a hair dye that it was permanently exempted from certification.¹⁶⁵ Though pure henna had been used as a fingertip and fingernail dye in the USA through the 1920’s, it was not approved for skin, either an oversight or

¹⁶⁵ TITLE 21 – FOOD AND DRUGS, CHAPTER I – FOOD AND DRUG ADMINISTRATION, DEPARTMENT OF HEALTH AND HUMAN SERVICES, SUBCHAPTER A—GENERAL, PART 73 – LISTING OF COLOR ADDITIVES EXEMPT FROM CERTIFICATION, Subpart C—Cosmetics, Sec. 73.2190 Henna.

(a) Identity. The color additive henna is the dried leaf and petiole of *Lawsonia alba* Lam. (*Lawsonia inermis* L.). It may be identified by its characteristic odor and by characteristic plant histology.

(b) Specifications. Henna shall conform to the following specifications:

It shall not contain more than 10 percent of plant material from *Lawsonia alba* Lam. (*Lawsonia inermis* L.) other than the leaf and petiole, and shall be free from admixture with material from any other species of plant.

Moisture, not more than 10 percent.

Total ash, not more than 15 percent.

Acid-insoluble ash, not more than 5 percent.

Lead (as Pb), not more than 20 parts per million.

Arsenic (as As), not more than 3 parts per million.

(c) Uses and restrictions. The color additive henna may be safely used for coloring hair only. It may not be used for coloring the eyelashes or eyebrows, or generally in the area of the eye.

paternalistic judgement of “foreign customs” with long-reaching and unfortunate consequences by the late 1990’s.¹⁶⁶ Compound henna was not addressed specifically in this legislation, nor was indigo, nor were other plant additives to henna.

The Federal Food, Drug, and Cosmetic Act of 1938.

1938 further increased government oversight of food and drugs and, for the first time, passed legislation for the regulation of cosmetics and medical devices. The FDA acknowledged that there were allergic reactions to coal-tar hair dyes, that could result in skin irritation and hair loss, but reached an agreement with the corporations which produced hair dye, if the formula limited the para-phenylenediamine content to an amount less than 6% and there were warnings of injury:

“FDA cannot take action against a coal-tar hair dye, as long as the label includes a special caution statement and the product comes with adequate directions for consumers to do a skin test before they dye their hair. This is the caution statement:

“Caution – This product contains ingredients which may cause skin irritation on certain individuals and a preliminary test according to accompanying directions should first be made. This product must not be used for dyeing the eyelashes or eyebrows; to do so may cause blindness. (FD&C Act, 601(a))¹⁶⁷

“For color additives, the 1938 FD&C Act mandated the listing of those coal-tar colors (other than coal-tar hair dyes) that were "harmless and suitable" for use in foods, drugs, and cosmetics. In addition, the act: contained adulteration and misbranding provisions for the use of coal-tar colors in foods, drugs, and cosmetics.¹⁶⁸

In 2006, para-phenylenediamine was named “contact allergen of the year,” though phenylenediamine (PPD) has been the leading permanent oxidative hair dye since the 1920’s, following its invention and use in fur, textile and leather dye, and causing injuries agent since its release into commerce. Because of its allergic potential, it was banned in France and Germany from 1906 until the 1980s to 1990s, when it was again allowed for use in member states of the European Union¹⁶⁹ Para-phenylenediamine (PPD) became one of the five chemicals labeled as “strong sensitizers” by the Consumer Product Safety Commission in 1961. Currently, para-phenylenediamine in cosmetics that would be in contact with skin is prohibited, though eyelash

(d) Labeling. The label for henna shall bear the information required by 70.25 of this chapter and the following statements or their equivalent:

"Do not use in the area of the eye."

"Do not use on cut or abraded scalp."

(e) Exemption from certification. Certification of this color additive for the prescribed use is not necessary for the protection of the public health and therefore batches thereof are exempt from the certification requirements of section 721(c) of the act.

¹⁶⁶ Basas, C. G. (2007) “Henna tattooing: cultural tradition meets regulation.” *Food and Drug Law Journal*, 2007;62(4):779-803.

¹⁶⁷ <http://www.fda.gov/Cosmetics/ProductsIngredients/Products/ucm143066.htm#law>

¹⁶⁸ <http://www.fda.gov/ForIndustry/ColorAdditives/RegulatoryProcessHistoricalPerspectives/>

¹⁶⁹ DeLeo (2006) Contact Allergen of the Year: p-Phenylenediamine Dermatitis. 17 (2): 53-55

and eyebrow dye containing para-phenylenediamine have recently appeared on the market. It is limited in hair dye to 6%, though it is moot that one can dye hair without touching the scalp.¹⁷⁰ Kligman found that a 10% patch test of para-phenylenediamine will sensitize 100% of people in five applications or fewer.¹⁷¹ People who use commercial oxidative black hair dye limited to 6% para-phenylenediamine frequently become sensitized in a matter of years, if not months. However, “black henna” hair dye products produced in India and Pakistan range up to 30% and are readily available worldwide.¹⁷² Higher para-phenylenediamine content increases the rapidity and certainty of health consequences. Every application of para-phenylenediamine increases the likelihood that the dyer will become allergic, just as every year of smoking increases the likelihood that the smoker will develop lung and pulmonary disease.

Since sensitization to para-phenylenediamine increases over time and exposure, it is possible to have suffered an allergic reaction even if you have dyed your hair without consequence in the past. A patch test is required for every use, and even if you don’t see a reaction to the skin test in 48 hours, it is still possible to have a reaction when you dye your hair. Delayed type 4 hypersensitivity reactions to para-phenylenediamine may take up to thirty days to appear. A company’s hair dye formulations may change over time and provoke an allergic reaction to a new formula. Persons changing from one brand to another marketed as “PPD-Free” or “Non-Allergenic” in hope of avoiding an allergic reaction may find that, through cross-sensitization to similar oxidative dyes, they still have an allergic reaction.¹⁷³ Potent contact sensitizers are nearly universal in oxidative hair dyes sold in the United States. Although para-phenylenediamine is a common allergen, resorcinol and m-aminophenol were found more frequently. All but one of one hundred seven oxidative hair dye products (99%) contained at least one potent sensitizer, and the average product contained six. Para-phenylenediamine was found in 83 products (78%), resorcinol (89%), m-aminophenol (75%), p-aminophenol (60%) and toluene-2,5-diamine (21%) were also frequently included in hair dye formulations.¹⁷⁴ If PPD is in hair dye, how can it not be in prolonged skin contact? If repeated applications of PPD increase the probability of contact dermatitis to life-threatening illness, why would a company put it in a product for graying hair knowing that a monthly application to the base of the hair, in contact with the scalp, would be necessary for upkeep?

¹⁷⁰Goldenberg, A., Jacob, S. E. (2015) Paraphenylenediamine in black henna temporary tattoos: 12-year Food and Drug Administration data on incidence, symptoms, and outcomes *Journal of the American Academy of Dermatology*, April 2014, Volume 72, Issue 4, Pages 724 – 726

¹⁷¹ Kligman, A. M. (1966) “The Identification of Contact Allergens by Human Assay. III, The maximization Test: A Procedure for Screening and Rating Contact Sensitizers.” *Journal of Investigative Dermatology*, The Williams and Wilkins Co.

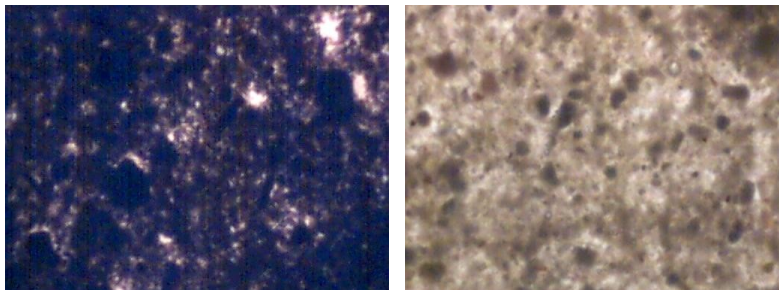
¹⁷² Weiyang Chena, Thobile. A.N. Nkosia, Sandra Combrinck, Alvaro. M. Viljoen, Catherine Cartwright-Jones. (2016) “Rapid analysis of the skin irritant p-phenylenediamine (PPD) in henna products using atmospheric solids analysis probe mass spectrometry” *Journal of Pharmaceutical and Biomedical Analysis*, Volume 128, 5 September 2016, Pages 119–125

¹⁷³ Ingram, John R., T. Meirion Hughes, and Natalie M. Stone. (2014) “Potential danger of hair dyes marketed as free from para-Phenylenediamine.” *International Journal Of Dermatology* 53, no. 4: e257-e258.

¹⁷⁴ Hamann, D., Yazar, K., Hamann, C. R., Thyssen, J. P., Lidén, C. (2014) “p-Phenylenediamine and other allergens in hair dye products in the United States: a consumer exposure study.” *Contact Dermatitis*. 2014 Apr;70(4):213-8.

Para-phenylenediamine Sold as ‘Henna’ and ‘Black Henna’

By the 1980’s powdered para-phenylenediamine mixtures were marketed as “black henna” in India and in the Arabian Peninsula. Pure henna, *lawsonia inermis*, is always a dull green color, as shown in the microscopy, below, right. Para-phenylenediamine is initially colorless, but darkens to black when oxidized by air or another oxidizing chemical. If any powder labeled ‘henna’ is dark brown or black, it is NOT pure henna. There is no ‘black henna plant,’ nor is there any part of the henna plant that is black or which dyes hair black.



Left: 30% para-phenylenediamine powder sold as “Black Henna.”

Right: pure henna leaf powder

Microscopy by Catherine Cartwright-Jones PhD

In the many brands of oxidative dye marketed as ‘henna’, the para-phenylenediamine may be undeclared, or it may be declared under another name. The following are other names for para-phenylenediamine.¹⁷⁵

- PPD or PPDA
- Phenylenediamine base
- p-Phenylenediamine
- 4-Phenylenediamine
- 1,4-Phenylenediamine
- 4-Benzenediamine
- 1,4-Benzenediamine
- para-Diaminobenzene (p-Diaminobenzene)
- para-Aminoaniline (p-Aminoaniline)
- Orsin™
- Rodol™
- Ursol™

In packages of para-phenylenediamine-adulterated henna, the word ‘henna’ is generally featured prominently on the front of the package. Often, the ingredient para-phenylenediamine is much smaller than word ‘henna,’ in an obscure place on the package, or only inside a sealed package so that the purchaser will only see the word ‘henna’ at point of purchase. The customer is deceived to believe that they are purchasing a harmless, natural henna product.

¹⁷⁵ Ngan, V. (2002) “Allergy to paraphenylenediamine” DermNet NZ



The declaration of para-phenylenediamine is not on the exterior of the package shown above; it is only on the package insert sealed within the package, shown below, so it cannot be read by the consumer before purchase:

**HENNA POWDER
FOR HAIR**

Henna a leaf of a small shrub of an Indian Plant, dried and powdered used as hair dye.

DIRECTIONS FOR USE :

1. Unpack Henna pouch into a bowl and pour water in it to make the paste. Knead it well breaking all lumps.
2. Apply the paste with a brush and thin toothed comb to hair, from root to top parting hair to small bunches. Leave no hair untinted. Apply repeatedly to the borders of the hair on brow. Do not let the paste remain unused for long, as its efficiency reduces.
3. Let the pasted hair absorb colour thoroughly and go completely dry. For quick results, Hair Dryer may be used. Then wash the hair with water and soap or shampoo until rinsing water becomes clear and entirely colourless. After drying hair with a towel or a dryer. set in required style Brillint shine appears on hair.
4. Use the contents of the pouch on single application and do not preserve balances. This product is for external use only . it should not be used for dyeing eyelashes or eyebrows. To test allergy, please first apply. Henna within inside your elbow. Let it dry for sometimes and watch the reaction. In case of reddening, burning, itching or irritation in or around that portion, consider yourself allergic to the product. Otherwise go-ahead safety with the use of Henna.
Paraphenylene-diamine content after dilution not more than 2 % for Black 0.2% for Brown/Chestnut Henna.

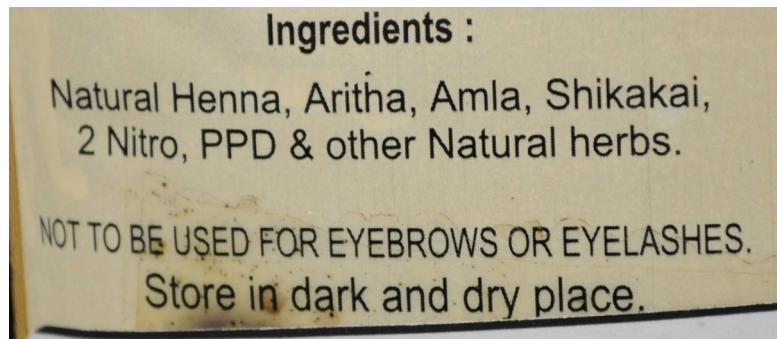
POISON : Not for Internal use.
Do not use to dye eyelashes or eyebrows.
Avoid contact with eyes.
Keep out of reach of children
Caution : This preparation may cause skin irritaion in certain person and should be used only in accordance to this leaflet.

<p>INGREDIENTS : Herbal Henna Powder Para Phenylene Diamine . Citric Acid. Herbal Amla Powder Magnesium Sulphate.</p>
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The package insert for “Export Quality” Eagle Black Henna declares para-phenylenediamine, but not the percentage in dry powder, and gives no indication of the dilution required to reduce the para-pheneylendiamine content to 2%.

Ingredient Declarations of “Henna Hair Dye” from India Which Include Up To 30% Para-Phenylenediamine

The Bureau of Indian Standards has set a maximum permissible limit of 30% para-phenylenediamine content for dry henna hair dye powder. However, many manufacturers do not comply with these standards.¹⁷⁶ The following images are ingredient declarations of ‘black’ and ‘brown’ ‘henna’ hair dye products purchased online and in Indian food markets between 2008 and 2018.¹⁷⁷ None included a declaration of para-phenylenediamine content, though tests showed that the para-phenylenediamine content ranged in these dry powders from 3% to 35%.¹⁷⁸



Sold as ‘herbal henna mehandi,’ declared to contain para-phenylenediamine (PPD) and 2-nitro para-phenylenediamine



Sold as ‘real herbal mehndi,’ declared to contain para-phenylenediamine, dilution proportion unspecified

¹⁷⁶ Gupta, M., Mahajan, V., Mehta, K., and Chauhan, P. (2015) Hair dye dermatitis and p-phenylenediamine contact sensitivity: A preliminary report” *Indian Dermatology Online J.* 2015 Jul-Aug; 6(4): 241–246. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4513401/> accessed March 29, 2018

¹⁷⁷ Author’s private collection, Catherine Cartwright-Jones PhD

¹⁷⁸ Weiyang Chena, Thobile. A.N. Nkosia, Sandra Combrincka, Alvaro. M. Viljoen, Catherine Cartwright-Jones “Rapid Analysis of the Skin Irritant p-Phenylenediamine (PPD) in Henna Products using Atmospheric Solids Analysis Probe Mass Spectrometry” *Journal of Pharmaceutical and Biomedical Analysis*, Volume 128, 5 September 2016, pp. 119–125

Key Ingredients: Natural Henna, Amla Powder, Methi Powder, Reetha Powder, Shikakai Powder, Coffee Powder, Tartaric Acid, Sodium Perborate, Para Amino Phenol & Para-Phenylenediamine.

Sold as 'henna natura,' declared to contain Para Amino Phenol, Para-phenylenediamine

Contains : Powder Hair Dye
Mehandi Powder, Amla Powder, Shikakai Powder, Reetha Powder, Neem Leaves Powder, Barium Peroxide, 2-N-Paraphenylenediamine & Citirc Acid

Sold as 'henna,' declared to contain 2-N-Paraphenylelnediamine

POISON. For external use only.
INGREDIENTS : Natural Henna, Amla, Shikakai, Barium Peroxide, Citric Acid, Phenylenediamine.

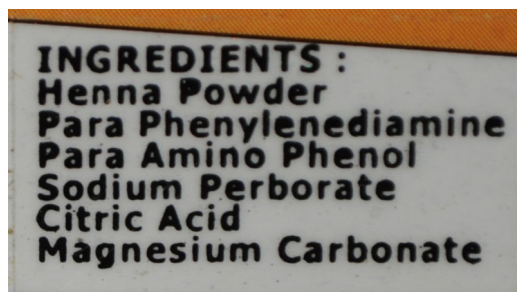
Sold as 'henna,' declared to contain Phenylenediamine

Key Ingredients : Henna Powder, Sodium Perborate, P-Phenylene Diamine, Tartaric Acid, Indigofera Tinctoria, Hibiscus.

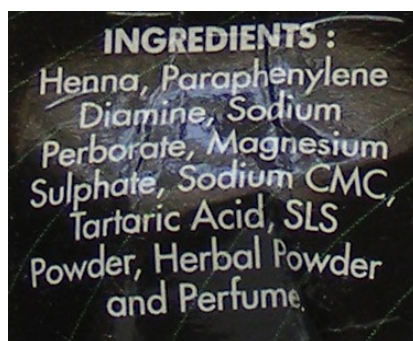
Sold as 'herbal black henna,' declared to contain P-Phenylene Diamine

POISON : STRICTLY FOR EXTERNAL USE ONLY.
INGREDIENTS : HENNA POWDER, PARA-PHENYLENEDIAMINE
BARIUM PEROXIDE, CITRIC ACID.

Sold as 'mehandi,' declared to contain Para-phenylenediamine



Sold as ‘ammonia-free brown henna,’ declared to contain of para-phenylenediamine and para amino phenol, with sodium perborate as the oxidizer rather than peroxide. This declaration is a sticker which appears to have been added to comply with export regulations. The box for domestic use did not include the declaration sticker.



Sold as ‘henna,’ declared to contain Paraphenylene Diamine



“Henna Stone,”¹⁷⁹ allegedly ‘natural’ stone from ‘the banks of the Nile’ is sold with henna at apothecary shops in North Africa, the Middle East, and the Levant for the purpose of making ‘black henna’ hair dye or body art. This is 95% + solid pure industrial para-phenylenediamine.¹⁸⁰

¹⁷⁹ Özkaya E, Yazganoglu KD, Arda A, Topkarci Z, Erçag E. 2013. “The “henna stone” myth” *Indian Journal of Dermatology and Venereal Leprology* 79:254-6

¹⁸⁰ Confirmed solid para-phenylenediamine in author’s private collection, Catherine Cartwright-Jones PhD

Para-phenylenediamine Marketed as “Black Henna” and Applied Directly to Skin



This is a hypersensitivity reaction to para-phenylenediamine sold as ‘black henna’ and applied to skin as body art.¹⁸¹

The image above of a woman’s arm blistering from an application of ‘black henna,’ a paste with little or no henna, but a high content of para-phenylenediamine. ‘Black henna’ temporary tattoos are created with paste containing 12.5%¹⁸² to 80% PPD.¹⁸³ This is the same injury as was caused when Pauline Karr got a drip of Inecto Notox Rapid on her finger in 1924. The woman will have the same subsequent health problems as the same as in Falk vs Inecto in 1928, and described by Oscar Levin, MD in 1928.¹⁸⁴

Para-phenylenediamine has been conflated with henna as ‘black henna’ since the 1970’s and has popularized around the world for celebratory and festival skin adornment. Based on my doctoral research,¹⁸⁵ as of 2015, I estimated that there were 150,000,000 individuals who had been sensitized to PPD through vacation souvenir ‘black henna’ temporary tattoos, and a much larger number had been sensitized through cultural use. A sensitization test in Manchester, UK, found the sensitization rate among children in had risen from 3% in the 1990’s to 8% in 2005 to 16% in

¹⁸¹ Kelley, N. (2017) “Black henna allergy” *Cardiff and Vale University Hospital NHS Trust*

¹⁸² Brancaccio, R.R., et al. “Identification and quantification of para-phenylenediamine in a temporary black henna tattoo.” *American Journal of Contact Dermatitis*, v. 13 issue 1, 2002, p. 15-8.

¹⁸³ Almeida, Pablo J., et al. 2012. “Quantification of p-phenylenediamine and 2-hydroxy-1,4-naphthoquinone in henna tattoos.” *Contact Dermatitis* 66, no. 1:33-37

¹⁸⁴ “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.

¹⁸⁵ Cartwright-Jones, C., “The Geographies of the Black Henna Meme Organism and the Epidemic of para-Phenylenediamine Sensitization: A Qualitative History.” PhD dissertation. Kent State University (2015) <http://www.tapdancinglizard.com/dissertation/>

2014,¹⁸⁶ probably from children acquiring ‘black henna’ temporary tattoos on vacation. The artists, parents, and children seem to have not known that there was para-phenylenediamine in the black paste, nor did they have any idea that it could be harmful.

In other countries where women use products marketed as ‘black henna’ containing para-phenylenediamine for celebrations and weddings, there are far more injuries. “The death toll of henna application (i.e. para-phenylenediamine ‘black henna’) in east Libya has risen to 59 since the registration of the first case in 2011. The town of Marj has hit the highest levels of toxic henna usage where 1022 cases and 44 deaths were recorded.”¹⁸⁷

In Sudan, where the first injuries from para-phenylenediamine used for ornamental skin decoration were reported in the 1970s, “Many Sudanese brides have collapsed and died on their wedding days after using this blackened henna because henna artists use a highly poisonous crushed-rock powder that they mix with natural henna to produce a deep black colour. In other cases, the use of Para-Phenylene Diamine (PPD), an active ingredient in many black hair dyes, is responsible for the severe allergic reactions.”¹⁸⁸

The FDA, chemical manufacturers and physicians were aware that para-phenylenediamine dyes caused severe allergic reactions and could be fatal, but people insisted on using them. In the late 1930’s the FDA and hair dye manufacturers agreed that if levels of para-phenylenediamine were kept below six percent in hair dye, then no warning labels would be needed and the manufacturers would be protected from prosecution in injuries. This addressed the immediate problem of people being severely injured from hair dye, but it masked the dangers from allergic reaction, which include multiple chemical sensitivities, asthma, hair loss, blistering, and cross reactions with many other products.

This limiting of para-phenylenediamine levels does not address other health risks from cumulative exposure to these chemicals, to the client and to the cosmetologist. Many cosmetologists find they become so allergic to para-phenylenediamine that they must quit their jobs and find another career. Forty-five percent of cosmetologists are sensitized to para-phenylenediamine and have higher cancer risks than the general population.¹⁸⁹ Many physicians advise patients with high cancer risks to discontinue using para-phenylenediamine chemical hair dyes, and obstetricians regularly recommend their patients not dye their hair with oxidative dyes during pregnancy. Any person whose physician has recommended that they not use oxidative hair dye can immediately switch to Ancient Sunrise® henna hair dyes; Ancient Sunrise® products are pure plant powders, with no mineral salts, no lead, and no oxidative dyes.

¹⁸⁶ Smith V, Clark S, and Wilkinson M. “Allergic contact dermatitis in children: trends in allergens, 10 years on. A retrospective study of 500 children tested between 2005 and 2014 in one U.K. centre.” *British Association of Dermatologists’ Annual Conference*. Leeds Teaching Hospitals NHS Trust, Leeds, U.K. (2015).

¹⁸⁷ AbdullahBenIbrahim, (2017) “Bride dies of toxic henna in east Libya,” *The Libya Observer*, February 27, 2017

¹⁸⁸ Bathish, H., Fleihan, T., Abdullah, A. A., Zain, A. A., Agarib, A., (2003) Black Sudani henna 'can trigger severe allergic reactions,' *Kaleej Times*. February 4, 2003

¹⁸⁹ Mukkanna, K. S. Stone, N., and Ingram, J. R., (2017) “Para-phenylenediamine allergy: current perspectives on diagnosis and management” *Journal of Asthma and Allergy* 2017; 10: 9–15.

Testing a Dye of Unknown Content for Para-phenylenediamine

This test for para-phenylenediamine adapted from Heim's test for para-phenylenediamine residue in fur.¹⁹⁰

“Apply hair dye of unknown content to hair harvested from your hairbrush. Prepare the dye according to instructions. Rinse the sample with water after twenty minutes and pat dry. Apply a three percent solution of acetic acid to the dyed hair and warm to 45C. Squeeze the liquid out of the dyed hair sample into a clear glass dish, add one drop of an aniline solution, mix, and add a few crystals of potassium persulfate. The appearance of a blue-green color in about five seconds indicates the presence of para-phenylenediamine or a derivative such as para-toluenediamine. This is a very sensitive test, and can be used to find even trace amounts of para-phenylenedamine. It will not, however, reveal m-phenylenediamine.”

Warnings from DuPont Protection Technologies about Para-Phenylenediamine¹⁹¹

p-Phenylenediamine Technical
(p-Diaminobenzene)
CAS Reg. No. 106-50-3
C₆H₄(NH₂)₂

DuPont advises that para-phenylenediamine should not be used in products that have direct human contact.

“P-Phenylenediamine is:

- Harmful if inhaled.
- May cause skin and eye irritation.
- May cause allergic skin or asthmatic respiratory reaction

“In case of accident:

- Personnel cleaning up solidified spills of industrial p-phenylenediamine should wear chemical splash goggles, rubber boots, rubber gloves, and appropriate respiratory protection. Wearing disposable coveralls or a butyl rubber suit should be considered.
- Avoid contact of p-Phenylenediamine with eyes, skin, and clothing.
- Avoid breathing dust or vapor.
- Use with adequate ventilation, and wash thoroughly after handling
- If inhaled, remove to fresh air. If not breathing, give artificial respiration, preferable mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.”

¹⁹⁰ Heim, O. “A Simple and Sensitive Test for p-Phenylenediamine” March 26, 1935 *Industrial and Engineering Chemistry* Vol 7, No. 3.p 146

¹⁹¹ DuPont (2011) <http://www.dupont.com/content/dam/dupont/products-and-services/fabrics-fibers-and-nonwovens/fabrics-fibers-and-nonwovens-landing/documents/PPD%20Tech%20Sheet.pdf>

Compound Henna Part 4: Walnut, Silver Nitrate, and Para-phenylenediamine as Brunette Hair Dye



In the middle of the 19th century, home-made hair dye formulae contained fresh, green walnut husk for covering the grey in brunette hair. These generally followed the well-understood method of dyeing wool a range of brown and black colors with green walnut husks. The indigenous people of North America used walnut (*Juglans nigra* or *J. rupestris*) bark, leaves, hulls, and roots to dye fibers a range of colors from yellow to dark brown.¹⁹² Early settlers found they could mask graying hair by rubbing with green or ripe walnut shells.¹⁹³ The dye molecule in the green walnut husks is juglone, a naphthaquinone similar to lawsone, the dye molecule in henna. People who harvested walnuts in the fall¹⁹⁴ or who played under walnut trees as children¹⁹⁵ knew that their fingers would be stained brown from green walnut husks and also knew that walnut stains could cause blistering rashes.

Walnut (juglone) dye from green walnut husks is a stable vegetal dye for wool which can be used with or without mordants,¹⁹⁶ and with or without prolonged boiling. That would make green

¹⁹² Richards, L. "Folk Dyeing with Natural Materials in Oklahoma's Indian Territory" *Material Culture*, Vol. 26, No. 2 (SUMMER 1994), pp. 29-47

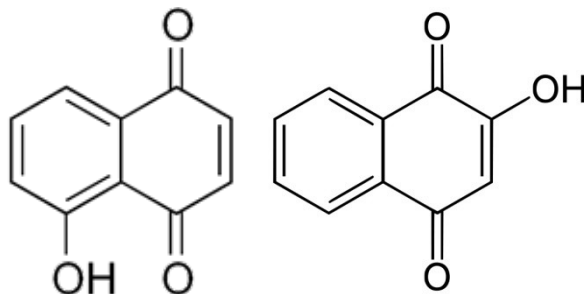
¹⁹³ Roia, F. (1966) "The Use of Plants in Hair and Scalp Preparations" *Economic Botany*, Vol. 20, No. 1 Jan. - Mar., 1966, pp. 17-30

¹⁹⁴ Foti, C., Romita, P., Angelini, G., and Bonamonte, D. (2015). "Allergic Contact Dermatitis to Walnut (*Juglans Regia*) Husk." *Indian Journal of Dermatology* 60, no. 6: 622-623.

¹⁹⁵ Neri, I., Bianchi, F., Giacomini, F., Patrizi, A., (2006) "Acute irritant contact dermatitis due to *Juglans regia*" *Contact Dermatitis* Volume 55, June 29, 2006 Issue 1, Pages 62-63

¹⁹⁶ Nicholson, S. M. and Clovis, J. F. (1967) "Dye Plants and Dye Methods in West Virginia" *Castanea*, Vol. 32, No. 2 (Jun., 1967), pp. 111-116, Southern Appalachian Botanical Society Chrome mordants were used to dye wool khaki with walnut hulls, and alum mordant was used to dye wool brown.

walnut husks a good candidate for hair dye except that other molecules in walnut husk, bark, and roots often cause contact dermatitis¹⁹⁷ and allergic reactions.¹⁹⁸



Left: Juglone from walnut 5-hydroxy-1,4-naphthalenedione, an isomer of lawsone:

Right: Lawsone from henna: 2-hydroxy-1,4-naphthoquinone

Products labeled as walnut juice were marketed as a hair dye in the late 1800s. The Year-Book of Pharmacy, in 1886, reported walnut hair oil formula that darkened hair,

“Walnut Hair Oil (*Chemist and Druggist*): Crush 2 ounces of fresh green walnut shells with 1 ounce of powdered alum to a smooth paste; digest with 10 ounces of benzoinated oil in a waterbath until all aqueous vapour has been driven off. Perfume with two drops of otto of roses and 10 drops of oil of neroli. The walnut shells are best obtained about the end of August or beginning of September. They contain, besides an oil and other constituents, a substance resembling pyrogallic acid, and impart a brown shade to the hair.¹⁹⁹

¹⁹⁷ Craton, D. W., Williams, R. D. (1980) Juglone dermatitis: allergy or irritant? [Chemical (C₁₀H₆O₃) found in black walnut (*Juglans nigra* L.) and other *Juglans* species]. *Proceedings of the Indiana Academy of Science*

¹⁹⁸ Thermo Scientific. Walnut, Allergens. <http://www.phadia.com/en/Products/Allergy-testing-products/ImmunoCAP-Allergen-Information/Food-of-Plant-Origin/Seeds--Nuts/Walnut/> Walnut husks can produce a rich yellow-brown to dark brown dye that is used for dyeing fabric and for other purposes. Husks should be handled wearing rubber gloves, to avoid dyeing one's fingers. Allergens: The following allergens have been characterized:

Jug r 1, a 14-16 kDa protein, a 2S albumin, a major allergen (1,3-9).

Jug r 2, a 44-48 kDa protein, a 7S vicilin globulin, a major allergen (1,3,5-7,10).

Jug r 3, a 9 kDa protein, a lipid transfer protein, a major allergen (5-7,11).

Jug r 4, a legumin-like protein. (5-6,12-13).

Jug r profilin (14).

Jug r 1, a 2S albumin, was shown to be a major allergen in a study of 20 American Walnut-allergic individuals; the allergen bound 75% of the patients' sera. Similarly, IgE binding to Jug r 1 was demonstrated in 12 of 16 (75%) sera from Walnut-allergic patients.

¹⁹⁹ Braitwaite, J. O. “Year-book of Pharmacy comprising Abstracts of Papers relating to Pharmacy, materia Medica, and Chemistry contributed to British and Foreign Journals from July 1 1885 to June 30, 1886 with the Transactions of the British Pharmaceutical Conference at the Twenty-Third annual Meeting held at Birmingham September 1886.” Page 306

The same “Year-Book of Pharmacy” reported another formula for hair dye containing ripe walnut husks.

“Walnut Hair dye (*The National Druggist*): The juice of the fresh walnut rind has been used from time immemorial as a hair dye. Bernschen and Semper have recently communicated to the Berlin Chemical Society a method of preserving it for use in the shape of a hydroglucoside, prepared as follows: — the rinds of the ripe nut are digested in sulphuric ether until their colouring matter is extracted. A solution of chromic acid in water is added to the ether solution, and the mixture thoroughly agitated. The ether is then distilled off, and the residue purified by solution, first in hot ether and afterward in a mixture of chloroform and petroleum ether, from which latter it is obtained in a crystalline form, as hydrogen glucoside. This substance colours the hair and skin exactly as does the juice of the fresh rind.”²⁰⁰

Formulating and Marketing Brunette and Black hair Dye in the late 19th Century: Silver Nitrate, Lead Acetate, Walnut

In the late 19th century, henna, henna-rastiks (pyrogallol, copper, and iron), and to a lesser extent, indigo renga,²⁰¹ were available to dye hair brunette and black colors through colonial trade with the Ottoman Empire, Arabia, and North Africa. Piesse, the author of “Useful Information about Hair Dyes,”²⁰² seems to have regarded Northern European cultures, pale skin and hair as superior to that of their conquered territories, and that dyeing hair dark was deplorable, “As a rule, all hair-dyes should be avoided; in almost every case the process is prejudicial to the unities which tend to form that harmonious whole, which we call personal beauty. ... The Teutonic beauty of Anglo-Saxons and Anglo-Normans, has come down to the people of Great Britain along with the practical common sense of the one, and the lofty bearing of the other. The mass of female loveliness which graces the land is therefore essentially "fair" -white and clear- in contradistinction to brown and dark.”

He did concede that premature gray for “Such persons who do not exhibit these marked features of Teutonic extraction, in whose veins commingles the blood of a more southern race ...” might use hair dye “without infringing the principles of the harmony of color”.

Piesse seems to refer to the use of henna in the following statement, “hair is too bright an auburn its redness can be artificially lowered by the application by the application of what the French

²⁰⁰ Braithwaite, J. O. “Year-book of Pharmacy comprising Abstracts of Papers relating to Pharmacy, materia Medica, and Chemistry contributed to British and Foreign Journals from July 1 1885 to June 30, 1886 with the Transactions of the British Pharmaceutical Conference at the Twenty-Third annual Meeting held at Birmingham September 1886.” Page 309

²⁰¹ For more information on 19th century henna in Europe, see “Compound henna, rasticks, henna-reng, henna-rasticks, and metallic salts” Ancient Sunrise® Chapter 3, Compound Henna, *Ancient Sunrise® Henna for Hair*, Catherine Cartwright-Jones PhD
http://www.tapdancinglizard.com/AS_henna_for_hair/chapters/chap3/henna_reng_rastik_compound.pdf

²⁰² Piesse, S., (1859). “Useful Information About Hair Dyes” *Scientific American*, Vol. 14, No. 41 (JUNE 18, 1859), p. 342, Scientific American, a division of Nature America, Inc.

perfumers name *Eau Crayon*, pencil-water, but which is, called by its right name, simply walnut-water.”²⁰³

Piesse continues on to describe brunette hair dye techniques as a way to color naturally dark colored hair that is becoming gray with age. Please note: the techniques described here are presented only for historical interest. They are dangerous and extremely damaging to the hair and should not be attempted by anyone. They do highlight the problems of walnut hair dye in that they rely on lead acetate and silver nitrate for color rather than the husks themselves.

“Nearly everybody is familiar with the property of the juice of the walnut husk to stain the skin of a dark brown. By some chemical magic this water can be prepared to darken the hair, and yet not to stain skin.²⁰⁴ This liquid, sold by the manufacturing perfumers, is the best for darkening the hair, without, strictly speaking, dyeing it. Walnut water does not darken the hair very rapidly; it therefore requires to be applied repeatedly during several weeks, and the change, however slow, is thus the more natural and unobserved. There are several good recipes to dye grey hair. The quickest dyes have the fault of staining the skin, should any portion touch the skin or scalp by accident,²⁰⁵ which it is almost impossible to avoid. The slower-acting dyes give more trouble, but are less likely to incur the unpleasant result of staining the skin.²⁰⁶

“A quick dye is made by dissolving a quarter of an ounce of nitrate of silver in little less than a quarter of a pint of distilled rose or elder water – even common water will do, provided it has been boiled for a few minutes, and then allowed to cool.²⁰⁷ If the hair be quite clean and freed from grease by first washing it with borax, dissolved in warm water, and then allowing it to get dry, the silver solution has only to be combed carefully through the hair in order to produce the effect desired.²⁰⁸ If the hair be allowed to remain disheveled and exposed to the action of sunshine, light, and air, the dye will act with increased rapidity; and if it be not dark enough, the dye can be again applied with increased effect. The application of a mordant, such as sulphate of ammonia, will also make the dye "strike" with greater rapidity; but it is a most disagreeable compound, and not to be recommended. Washing the hair with sulphur soap will help all dyes to produce a better color, whether they be walnut-water or silver solution. The best dye is thus prepared: Calcined magnesia, two ounces; quicklime slaked, two ounces; powdered litharge, eight ounces. Having slaked the lime with as little water as possible to cause it to

²⁰³ Piesse, S. (1859) “Useful Information About Hair Dyes” *Scientific American*, Vol. 14, No. 41 (June 18, 1859) p. 342, Scientific American, a division of Nature America, Inc.

²⁰⁴ Author’s note: walnut husk water is a very weak hair stain.

²⁰⁵ This description is consistent with silver nitrate which will stain skin brown unless diluted.

²⁰⁶ Lead acetate or other metallic progressive dye require repeated applications to build up a dark color.

²⁰⁷ Author’s note: Diluted silver nitrate will stain hair but not skin.

²⁰⁸ Author’s note: Silver nitrate stains skin and can cause burns. The material does not at first stain, it is just absorbed into the skin or hair. Later, exposure to light causes it to darken and then turn jet black. Side effects of silver nitrate include: burning and skin irritation, staining of the skin, blood disorder (methemoglobinemia). <https://www.bostick-sullivan.com/articles/silvernitrate.html>

disintegrate, mix the whole of the ingredients well together and they will be ready for use, in the following manner: -Mix the powder with enough water to form a thick creamy fluid; with the aid of a brush, completely cover the hair to be dyed with this mixture. To dye it light brown, allow it to remain upon the hair four hours; dark brown, eight hours; black, twelve hours. As the dye does not act unless it is moist, it is necessary to keep it so by wearing an oiled silk, india-rubber, or other waterproof cap. When the dye has taken effect, the hair has to be washed with an abundance of warm water.”²⁰⁹

A walnut hair dye formula without silver nitrate or lead acetate was offered in 1909 in the *British Medical Journal*. “The following formula for walnut hair dye is given in the *Pharmaceutical Journal Formulary*: Green walnut shells, 16 oz.; rose water, 4 fl. oz.; alum, 2 oz. Bruise the walnut pericarps and the alum together in a mortar, add the rose water, allow to macerate for four days, then strain and press. To every 3 oz. of expressed liquid add 1 oz. of eau de Cologne or other alcoholic perfume.”²¹⁰ A medical paper in 1909 reported injuries from “walnut juice hair dye,”²¹¹ though it reported that there had been many more injuries reported from para-phenylenediamine hair dye. These reactions evidence that walnut hair dyes being reformulated by manufacturers, the ‘walnut’ dye products depended more on silver nitrate or lead acetate than walnut to darken hair by simply combing the liquid through the hair and waiting for the stain to darken in the light.

By 1909, there were numerous cases of allergic reaction reported, which may have been caused by walnut juice or unlisted para-phenylenediamine. A note in the 1909 issue of *Drug Topics* reports injuries caused by products labeled as Walnut Juice Hair Dye which are more consistent with para-phenylenediamine injuries than with walnut allergic reactions.²¹²

“DANGER IN WALNUT JUICE HAIR DYE

“Hardaway (*Interstate Medical Journal*) writes that he has seen many cases of dermatitis follow the use of walnut juice as a hair dye. The amount of inflammatory action varies in different persons. Sometimes the attack is acute, involves the face, neck and ears, and presents such an amount of accompanying edema that the eyes are closed and the features unrecognizable. The subjective symptoms are burning and prickling sensations and intolerable tension. In some persons the condition is merely one of subacute inflammation, renewed from time to time by the reapplication of the dye, and limited to the ears and the skin at the margin of the scalp. In persons of an “eczematous habit,” the dye has apparently evoked a veritable eczema, which has extended to the arms and trunk. The hairy scalp itself is not particularly involved, since, as is well known, this region is naturally very insensitive.”

²⁰⁹ Piesse, S. (1859). “Useful Information About Hair Dyes” *Scientific American*, Vol. 14, No. 41 (JUNE 18, 1859), p. 342, *Scientific American*, a division of Nature America, Inc.

²¹⁰ Letters, Notes, And Answers Source: *The British Medical Journal*, Vol. 2, No. 2480 (Jul. 11, 1908), p. 124

²¹¹ Beddoes, T. P., Siebold, L. editor. (1909) *The British Medical Journal*, Vol. 2, No. 2543 (Sep. 25, 1909), p. 918

²¹² Hardaway, (1909) “Danger in Walnut Juice Hair Dye” *Drug Topics*

There were two contemporaneous manufacturers of “Walnut Hair Dye” in the United States in the first decades of the twentieth century: Mme. Robinnair’s Walnut Hair Dye and Mrs. Potter’s Hygienic Walnut Juice Hair Stain. Both initially branded their dye as harmless walnut hair dye; both seem to contain lead acetate or silver nitrate dye at the beginning, or very early in their formulation and manufacture, though their advertising claims denied such. Both later changed to cheaper para-phenylenediamine dye, causing many documented injuries. Both eventually dropped their claims of any association with actual walnut, though they continued to deny the dangerousness of their dye. Mme. Robinnair’s seems to always have been a local product in Georgia, though distributed by mail to other areas. Mrs. Potter’s walnut hair dye was based in Cincinnati and had a wider distribution in the mid-western and northern states.



Mme Robinnair’s Walnut Hair Dye Atlanta GA²¹³
Advertised between 1897 and 1917

Sequential advertising texts for Mme Robinnair’s Walnut Hair Dye Atlanta GA. in the Atlanta Constitution provide clues to the contents of the small purple bottle.

The 1903 ad for Mme. Robinnair’s Walnut Hair Dye, states that the dye “instantly restores faded or gray hair to natural color” and “one application” implies that this is not a lead acetate or progressive dye requiring multiple applications to achieve color. It may have been a silver nitrate dye, or possibly an early oxidative dye. Though the 1903 advertisements in Munsey’s magazine, volume 29 and Wiltshire’s Magazine, issue 65, claimed that Mme Robinnair’s contained only plant dyes, it is very unlikely that this dye is actually walnut-based.

Transcription of ad from Madame Robinnair’s Walnut Hair Dye, 1903 Atlanta Constitution is:

²¹³ Collection of author, Catherine Cartwright-Jones PhD

“Mme. Robinnaire’s Walnut Hair dye

“Instantly restores faded or gray hair or whiskers to natural color. Easily applied. Only one application required. The most perfect hair restorer made. Cures dandruff and falling out of the hair. Small, 25¢. Large 75¢., post-paid. Write for booklet toilet preparations. Jacobs’ Pharmacy,²¹⁴ Atlanta, Ga.”

By 1905 and 1906, the advertising claims for Mme Robinnaire’s Walnut Hair dye were more lavish and include more implied criticism of competitor’s dyes while making what were probably false claims about its own composition, based on contemporaneous pharmaceutical papers on hair dye.²¹⁵ Transcription of advertisement for Madame Robinnaire’s Walnut Hair Dye, 1905 Atlanta Constitution is:

“Mme Robinnaire’s Walnut Hair Dye

“Of the many hair dyes and similar preparations now on the market, nearly all have serious faults. Few are of any real value and none can be compared with Madame Robinnaire’s Walnut Hair Dye which is, unquestionably, the most valuable article of the kind ever offered to the public. Its merits are recognized by thousands of satisfied users in this and other countries and its sales have grown to enormous proportions.

“Madame Robinnaire’s Walnut Hair Dye is made from the pure juice of the black walnut (*Juglans Nigra*) and contains no minerals or injurious drugs or chemicals. It renews faded or gray hair, producing with wonderful faithfulness the natural shade of brown or black and giving the hair a rich glossiness. No one should allow the hair or whiskers to remain gray or faded when three or four applications a year of this wonderful preparation will bring back the color and beauty of youth.

“But Madame Robinnaire’s Walnut Hair Dye does more than merely color the hair. It stimulates the scalp, tones up the roots of the hair and causes a luxuriant growth. It keeps the scalp in healthful condition and prevents and cures dandruff and other scalp troubles. It strengthens the hair and makes it soft and silky instead of dry and brittle.

“Every man and woman whose hair is losing its natural color, turning gray or fading, should test the efficacy of Mme. Robinnaire’s Walnut Hair Dye by a trial. No other similar preparation or imitation possesses its merits, while many are positively dangerous to use.

²¹⁴ Jacobs’ Pharmacy in Atlanta Georgia was run by Dr. Joseph Jacobs, a pharmacist and innovator of ‘the American drug store.’ He claimed to be the first seller of Coca-Cola in his drug store soda fountain, beginning May 8, 1886. In 1929, Dr. Jacobs wrote an article for *Drug Topics*, an industry magazine for the pharmacy trade, describing the soda fountain in his building. “On the right-hand side of the entrance was a soda fountain ... The fountain enjoyed a wonderful reputation and did a large business. It averaged fully \$150.00 a day from the various drinks.”

²¹⁵ Beddoes, T. P., Siebold, L. editor. (1909) *The British Medical Journal*, Vol. 2, No. 2543 (Sep. 25, 1909), p. 918

“It can now be had of leading druggists in many cities, but wherever there is no local dealer it will be sent, postpaid, upon receipt of price by Jacobs’ Pharmacy, Co., Atlanta Ga.”

In 1909 and 1910, the advertising copy specified that there were four different colors available. Transcription of advertisement for Madame Robinnaire’s Walnut Hair Dye, 1909 Atlanta Constitution is:

“Madame Robinnaire’s Walnut Hair Dye

“Preserve your charms by preserving that which above all else is the secret of your charms – your hair. Beautiful hair means a beautiful woman. Faded, scanty, or gray hair is an indication of old age, no matter what your years may be. Mme. Robinnaire’s Walnut Hair Dye restores the hair to its original color, gives it life, vigor and luster.

“Choice of four shades – black, brown, dark brown and light brown. Will not fade. Small (trial) size 25¢. Large size 75¢. Sent postpaid anywhere.”

In 1917, the product no longer claimed to contain any walnut, the advertisement was small, and did not state any indication of the chemical composition. It was available in four different colors. Transcription of ad for Madame Robinnaire’s Walnut Hair Dye, 1917 Atlanta Constitution:

“Robinnaire Hair Dye Restores Natural Color

Keep the original, the natural color of your hair. Mme. Robinnaire’s hair dye can be used with perfect confidence that your original color and soft texture of your hair will be restored and maintained. It comes in black, brown, dark brown, and light brown. Any desired shade may be given (sic) the hair. Trial size 25¢. Regular size \$1.00. Manufactured only by Jacobs’ Pharmacy Co., Atlanta GA.

Mme. Robinnaire's also produced a face bleach, “A Perfect Beautifier,” to remove tan, moth patches, pimples, and was claimed to remove freckles in three to five days. Mme. Robinnaire's Powder claimed to be an absolutely pure and extremely fine rice powder, free from bismuth and arsenic.²¹⁶

Advertising Text for Mrs. Potter’s Hygienic Walnut Juice Hair Stain, in 1903, “Everybody’s Magazine,” was very similar to Mme. Robinnaire’s text.

“Gray Hair Restored Mrs. Potter’s Hygienic Walnut Juice Hair Stain

“Is the only strictly vegetable and perfectly harmless stain for restoring prematurely gray hair, white patches caused by fever, etc. It has no odor, and blends so perfectly with the natural color of the hair that experts cannot detect it. It does the work beautifully and inexpensively. Ordinarily one bottle will last a year. “The highest Medical Authorities

²¹⁶ Advertisement in “Silhouette A. S. C.,” 1907, Agnes Scott College, Decatur Georgia.

on the Hair in America and Europe endorse and recommend WALNUT JUICE as the safest and best hair stain. Thousands of educated and refined society people everywhere use it regularly. Stains any shade – from light golden brown to almost black. Tresses that have been ruined by chemical dyes or worthless stains are quickly restored. It does not burn the hair nor rub off on clothing. Good results are guaranteed to every customer. Price \$1. Per bottle. MRS. POTTER’S HYGIENIC DEPOT, 179 Groton Building, Cincinnati, Ohio.”

EVERYBODY'S MAGAZINE

GRAY HAIR RESTORED

Mrs. Potter's Hygienic
Walnut Juice
Hair Stain



Is the only strictly vegetable and perfectly harmless stain for restoring prematurely gray hair, white patches caused by fever, etc. It has no odor, and blends so perfectly with the natural color of the Hair that experts cannot detect it. It does the work beautifully and inexpensively. Ordinarily one bottle will last a year.

The highest Medical Authorities on the Hair in America and Europe endorse and recommend WALNUT JUICE as the safest and best Hair Stain. Thousands of educated and refined society people everywhere use it regularly. Stains any shade—from light golden brown to almost black. Tresses that have been ruined by chemical dyes or worthless stains are quickly restored. It does not burn the hair nor rub off on the clothing. Good results are guaranteed to every customer.

Price \$1.00 per bottle, by mail, in plain wrapper. Write for booklet and "Mrs. Potter's Talk to Ladies on the New Hygiene," a pamphlet replete with valuable information and new ideas on Physical Form and Beauty which every lady should know. Address

MRS. POTTER'S HYGIENIC DEPOT,
179 Groton Building, Cincinnati, Ohio.



Left: Mrs. Potter’s Hygienic Walnut Juice Hair Stain,²¹⁷ 1903 “Everybody’s Magazine”²¹⁸
Right, Bottle of Walnut Juice hair dye from Mrs. Potter’s Hygienic Supply Co. Cincinnati, Ohio²¹⁹

Based on the size of Mrs. Potter’s bottle containing the liquid and the instructions given, this product contained little, if any walnut juice. Combing a small amount of walnut juice, even if concentrated, through the hair would not have effectively covered gray. Dilute silver nitrate or lead acetate would have been more probable.

²¹⁷ Collection of author, Catherine Cartwright-Jones PhD

²¹⁸ “Everybody's Magazine” was founded in 1899. The editor, John O'Hara Cosgrave, was fully committed to investigative journalism. In August, 1902 the magazine published an article by Frank Norris exposing corrupt business dealings in agriculture. This was followed by another article on the treatment of miners, Life in the Mining Region (September, 1902). These articles established it as a magazine concerned with social justice. However, its critics described it as muckraking journalism.

²¹⁹ Image owned by and used with permission of Don Fadely.



1905 Red Book magazine advertisement for Mrs. Potter's Walnut Juice²²⁰

Advertising text for 1905 Red Book magazine advertisement for Mrs. Potter's Walnut Juice:

"Why Have Gray Hair?

Look Young It Pays

Gray Hair is costly. Society and business demand "Young Blood."

Stains gray, bleached, faded, and patchy hair, or beard, a beautiful modest brown, so natural in appearance that even experts cannot detect it. The shade may be made lighter or darker, as desired, to suit each individuality. Stains nothing but hair. Does not show on scalp. Makes no muss. Does not rub or wash off. Does not make hair conspicuous. Best remedy for "Bleached" and "Chemical Blonde" Hair. Very easy to use.

Enough to Last One Year for \$1.00

At drug stores, or by mail prepaid, in plain sealed wrapper.

Money refunded without argument if not fully satisfied.

Mrs. Potter's Hygienic Depot 15 Groton Bldg. Cincinnati, Ohio"

Marketing Para-phenylenediamine as Walnut Hair Dye in the Twentieth Century

By 1912, Mrs. Potter's had changed the product name to Walnut Tint Hair Stain, and the colorant was para-phenylenediamine. The product was sold with two liquids in bottles, and advertised as, "BROWN YOUR HAIR. Send for a trial package . . . Mrs Potter's Walnut Tint Hair Stain with your comb. Stains only the hair, doesn't rub off, contains no poisonous dyes,²²¹ sulfur, lead or copper. Has no odor, no sediment, no grease. One bottle of Mrs Potter's Walnut Tint Hair Stain should last a year. Sells for \$1.00 per bottle at first-class Druggists. We guarantee satisfaction."²²²

²²⁰ Collection of author, Catherine Cartwright-Jones PhD

²²¹ This product contained para-phenylenediamine.

²²² "Woman Beautiful Magazine," 1910 advertisement original transcribed by Don Fadely, used with permission.

The formula seemed to have been changed after 1905 when the dye was released as a two-bottle product. After many injury reports, the new Mrs. Potter's Walnut Juice Hair Stain was analyzed by chemists and reported to the American Medical Association.²²³

“This preparation is manufactured by the Mrs. Potter Hygienic Supply Company, Cincinnati, Ohio. It was analyzed by the chemists of the North Dakota Agriculture Experiment Station, who found it to consist of two liquids called No. 1 and No. 2, respectively, which according to directions were to be mixed before the dye was applied to the hair. Analyses showed bottle No. 1 to contain 1.86 per cent, absolute hydrogen peroxide; bottle No. 2 contained "a strong alcoholic liquid of a light brown color containing 54.45 per cent.' absolute alcohol by volume." No lead, bismuth or mercury compounds were detected. The report goes on to state that "the active principle of the dye appears to be a phenolic compound, and conforms to the tests, etc., for paraphenylenediamine, an aniline derivative which by oxidation becomes black or brown."



Mrs. Potter's Walnut Tint Hair Stain, bottles No. 1 and No. 2
Containing no walnut; the dye is para-phenylenediamine with peroxide.²²⁴

²²³ 1913 “Nostrums and Quackeries” Articles on the Nostrum Evil and Quackery Reprinted from the Journal of The American Medical Association. Journal of The American Medical Association. Press of American Medical Association, Chicago

²²⁴ Image owned by, and used with permission of Don Fadely.

“The poisonous qualities of paraphenylenediamine have long been known. Eighteen cases of poisoning have been reported by Cathelineau. Brocq described a severe form of dermatitis due to this chemical; Balso reports a case of poisoning due to wearing hose which had been dyed with the chlorate of paraphenylenediamine, and Mewborn reported a case of dermatitis from the use of a hair dye having this chemical for its base.

“A number of cases of poisoning due to the use of Mrs. Potter's Walnut Juice Hair Stain have been reported to" THE JOURNAL. They are as follows:

Feb. 13, 1909, Dr. A. Schalek, Omaha, Neb., 1 case.
March 6, 1909, Dr. W. W. Barker, Dorchester. Mass., 1 case.
March 15, 1909, Dr. W. W. Harrington, Spokane, Wash., 1 case.
March, 17, 1909, Dr. J. D. Gold, Bridgeport, Conn., 1 case.
April 7, 1909, Dr. E. N. Ewer, Oakland, Cal., 1 case.
May 15, 1909, Dr. J. H. Mackay, Norfolk, Neb., 1 case.
Aug. 13, 1909, Dr. E. A. Hannum, Cleveland Ohio, 1 case.
Aug. 18, 1909, Dr. J. G. Burke, Pittsburg, Pa., 1 case.
Aug. 18, 1909, Dr. W. W. Wood, Jamestown, N. D., 1 case.
Sept. 6, 1909, Dr. P. S. Roy, Washington, D. C, 1 case.
Sept. 8, 1909, Dr. D. V. Traver, Steelton, Pa., 1 case.
Sept. 13, 1909, Dr. M. L. Emerson, Oakland, Cal., 1 case.
Sept. 14, 1909, Dr. A. S. Storey, Cleveland, Ohio, 4 cases.
Sept. 21, 1909, Dr. B. Stanton, Cincinnati, Ohio, 5 cases.
Oct. 22, 1909, Dr. A. P. Good, Philadelphia. Pa., 2 cases.
Sept. 21, 1910, Dr. P. R. Straight, Bradford, Pa., 1 case.
Oct. 4, 1910, Dr. H. B. Ormsby, Cleveland, 1 case.
Oct. 17, 1910, Dr. H. K. Gaskill, Philadelphia, 3 cases.
Nov. 29, 1910, Dr. F. Eft, Philadelphia, 1 case.
Jan. 26, 1911, Dr. G. M. MacGregor, Garfield, Wash., 1 case.
April 27, 1911, Dr. F. T. Woodbury, Ft. D. A. Russell, Wyo., 1 case.
June 7, 1911, Dr. E. W. Rowe, Lincoln. Neb., 1 case.

“As this dye does not depend for its action on walnut juice, the name would seem to constitute misbranding within the meaning of the national Food and Drugs Act. This may account for the change that has been made in the name of the preparation. We now find it labeled not "Walnut Juice" hair stain, but "Walnut Tint."

“In the newspaper advertisements, however, we still (October, 1909) find it advertised as "Walnut Juice" Hair Stain, and the deception is carried still further in some cases by an accompanying picture of a woman with a basket on her arm with the legend under it "Gathering Walnuts." (From The Journal A. M. A., of various dates, with additions.}"²²⁵

²²⁵ 1913 “Nostrums and Quackeries” Articles on the Nostrum Evil and Quackery Reprinted from the Journal of The American Medical Association. *Journal of The American Medical Association*. Press of American Medical Association, Chicago

Walnut Powder as Hair Dye

J. L. Hopkins & Co. Inc sold bulk powders and herbs such as damiana, sarsaparilla, cannabis, and henna in the early to mid twentieth century. Hopkins sold reliably unadulterated Egyptian henna powder, as well as a ‘bronzing’ henna powder, and a ‘white henna’ powder that was hydromagnesite, hydrated magnesium carbonate. Hopkins produced a walnut blending powder, with instructions to use it as a pack, mixed with henna.



J. L. Hopkins & Co. Inc Walnut Powder, 1930's²²⁶

Text on front of J. L. Hopkins & Co. Inc Walnut Blending Powder package:

“1 lb Net Hopkins’ Black Walnut Blending Powder
Guaranteed not to contain coal-tar dyes or derivatives. Effective as a coloring agent for gray hair, when used with Hopkins’ Rajah Brand Egyptian Vegetable Henna.
A Wholly vegetable Product.
J. L Hopkins and Co., Inc. Importers, Millers and Manufacturers
The Earth Contributes and J. L. Hopkins and Co. Distribute Cosmetic Basic Materials”

Directions on side of J. L. Hopkins & Co. Inc Walnut Blending Powder package:

“Directions:

“The average pack contains from 2 to 4 parts of Henna and 1 to 2 parts of Black Walnut Blending Powder, depending on individual taste and the amount of gray mixture in the hair.

²²⁶ Collection of author, Catherine Cartwright-Jones PhD

“The first step is to shampoo the hair and rinse it thoroughly so that every particle of soap is removed. Clear warm water for rinsing is sufficient.

“Henna, Black Walnut Blending Powder and water are boiled slowly until all lumps have dissolved. The mixture should not be too thin. The pack is applied directly to the hair with the hands, which is advisable to protect with rubber gloves of good quality.

“Starting at the back of the head, the preparation is worked into the hair with a rotary movement from the base of the neck to the crown of the head.

“When the entire head has been covered, place a warm damp cloth or towel over it to keep the paste on the head securely.

“After the pack has been on the required time, the hair is immediately shampooed. The shampoo must be very thorough so that all the paste is removed. This prevents streaking.

Users of this product will be interested in Hopkins’ Rajah Brand Egyptian Vegetable Henna.”

The remnants of powder left in the Hopkins’ box are consistent with powdered walnut husk.

Testing Walnut Powder on Hair

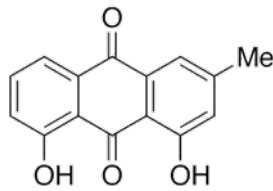
To test Hopkins’ claims for walnut hair dye, and claims of current online blogs, I tested walnut powder as a hair dye without alum or other mordants, and without a boiling application as is done with wool. The walnut husk powder produced a blackish paste when mixed with a mildly acidic liquid for an eight hour soak. Boiling walnut powder also produced a blackish paste and liquid, but when hair was immersed in the liquid, it was not stained. If there was little or no stain, it could not have covered gray as claimed by the early twentieth century manufacturers of walnut hair dye. The most reliable way of staining keratin with walnut is to use the green husks.

This walnut powder was sourced is certified organic black walnut hulls powder organic *juglans nigra*, origin USA,²²⁷ the same black walnut hulls that produced brown dye for indigenous North American people and colonists. Green walnut husks were used for traditional dye; the green husks also have the greatest likelihood of causing an allergic reaction, so personal experimentation should be done with caution.

²²⁷ The walnut powder was sourced from Starwest Botanicals, April 2018. The package declares it is certified organic black walnut hulls powder organic *juglans nigra*, origin USA. There is a warning on the package, ‘prolonged use is not advised due to the presence of significant quantities of juglone, a known mutagen in animals.



This is plain unprocessed white mohair; identical hair was used in each of these dye tests. Natural untreated, undyed, and unprocessed mohair serves as a reasonably consistent facsimile of human hair for dye testing. White farm-raised mohair has the advantage of not having variables caused by shampoos, conditioners, perms, straighteners, or previous dyeing, as well as being inexpensive and more easily available than human hair. The farmed mohair keratin is harder-surfaced than human hair, so I usually apply the dye paste for a longer time to more closely approximate the results on human graying hair.



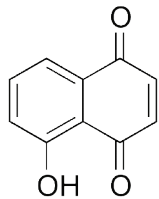
Chrysophanol, the anthraquinone dye molecule in cassia obovata



This is identical white hair dyed with Ancient Sunrise® cassia paste, mixed 8 hours ahead of time, applied to the hair, covered for 12 hours, and then rinsed with warm water. The pale golden color is typical of cassia obovata; the dye molecule is chrysophanol, an anthraquinone, a less robust keratin dye than the henna lawsone quinone.



Above is identical white hair with ½ Ancient Sunrise® cassia paste and ½ powdered walnut husk paste, mixed 8 hours ahead of time, stirred together, applied to the hair, covered for 12 hours, and then rinsed with warm water. The addition of walnut powder made the cassia dye slightly more golden, certainly not brown, and it was very difficult to rinse all the walnut particles from the hair.



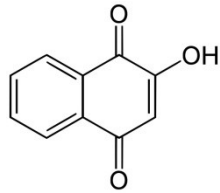
Juglone, the quinone dye molecule in walnut hull



Above is identical white hair with powdered walnut husk paste, mixed 8 hours ahead of time, applied to the hair, covered for 12 hours, and then rinsed with warm water. The walnut husk residue was very difficult to rinse from the hair. The walnut powder paste stained the hair, but it did not stain the hair a brown color. Juglone is an isomer of lawsone and the color resembles a weak lawsone stain. In an additional test, walnut hull powder and water were simmered for half an hour, then the same white hair was immersed in walnut hull water for several hours without a caustic mordant or additional boiling, as would be necessary for skin application. Though the hair was initially coated with thick, blackish liquid, all of the color rinsed away in the first washing. ‘Walnut water’ from boiling walnut powder left no stain on the hair whatsoever; some dye was released with the acidic mix.



Above is identical white hair with ½ Ancient Sunrise® henna and ½ powdered walnut husk paste, both mixed 8 hours ahead of time, stirred together, applied to the hair, covered for 12 hours, and then rinsed with warm water. The addition of walnut powder made the henna dye slightly more golden, but was very difficult to rinse all of the walnut particles from the hair. The addition of the walnut paste seems to have had negligible effect on the henna stain.



lawsone, the naphthaquinone dye molecule in henna



This is identical white hair with Ancient Sunrise® henna paste mixed 8 hours ahead of time, applied to the hair, covered for 12 hours, and then rinsed with warm water.

All of these samples were photographed 24 hours after rinsing the pastes from the hair.

Conclusion: the dye molecule in walnut hulls, when dried, and powdered, and mixed into a paste in a manner similar to henna, does not seem to be effective in dyeing hair brunette. Water from boiling walnut hull powder does not appear to leave any stain on hair at all. Walnut powder can cause blistering allergic reactions, so walnut powder should be considered a poor candidate for hair dye. It appears that juglone binds poorly with hair unless in a glucoside or aglycone precursor state, which seems to occur only in the green husk.

Ancient Sunrise® Henna for Hair Chapter 3, Compound Henna

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