



**INTRODUCTION  
TO HAIRCOLORING**

# INTRODUCTION



Have you ever watched a woman look at herself in the mirror? Her eyes scan the image with concern, brows pucker or ease. And, as she turns away, her general posture, her gait, her entire facial expression adjusts to the image she has just seen reflected there. She will carry that image with her, whether pleased or displeased. It may even affect the outcome of her day's encounters!

When you realize that the appearance of a woman's hair is probably the single most significant factor influencing her self-image, you will understand that the client who uses the services of a Professional Colorist is the most demanding client there is!

Today's client has become increasingly color-conscious. No longer is color used simply to cover or camouflage gray. Today, color is a fashion statement. Women—and men too—are choosing temporary, semi-permanent and permanent colors in an ever-widening range of smashing tints and hues to express moods, complement Seasonal Colors, reflect the fads and fashions of the moment, enhance natural color and much more. And new advances and products are enabling Professionals like you to do spectacular and dramatic effects never before imaginable! Therefore, as an expert in your field, you will be called upon to perform many specific and specialized haircoloring services. First, you will be expected to be a first-rate technician with an understanding of color theory and what the hair's texture and chemistry are all about. In addition, you must be familiar with a whole range of haircoloring products and how they work.

You should completely understand all the different categories of haircoloring—temporary, semi-permanent, permanent and highlighting—as well as how to perm and relax hair and how these services will affect the coloring process.

But applying professional colors does not make a Professional Colorist. Versatility in application is required. Today's sophisticated client—male or female, eighteen or sixty-five—is more educated, more style-conscious than ever before. Having a full range of professional techniques to call on will enable you to create the latest fashions in haircoloring. Later in this manual, techniques used by the CLAIROL team will be clearly illustrated for you.

Though technical expertise is essential, you will also be expected to be an artist. You will have to understand how color can complement and flatter skin coloring, how it can diminish or highlight good or bad features, how it can be used to alter the dimensions of a face, and how it can project the lines of a style.

You will also be expected to be fashion-wise. You will have to understand that hair and haircoloring are closely related to contemporary trends in fashion.



In addition, you will be expected to be something akin to a psychiatrist. You will have to listen carefully to your clients and understand not only their ideas, but their feelings. Sometimes, to have satisfied clients, you may be expected to understand them even better than they understand themselves. You will have to know how to accentuate a vivacious personality or complement a reserved one. You may not only have to please each client but also know what is going to please your client's spouse, boyfriend or girlfriend, or others. And you will be expected to understand that frequently your clients will come to you to change their image, renew their confidence or simply be taken care of and pampered while they are in your salon.

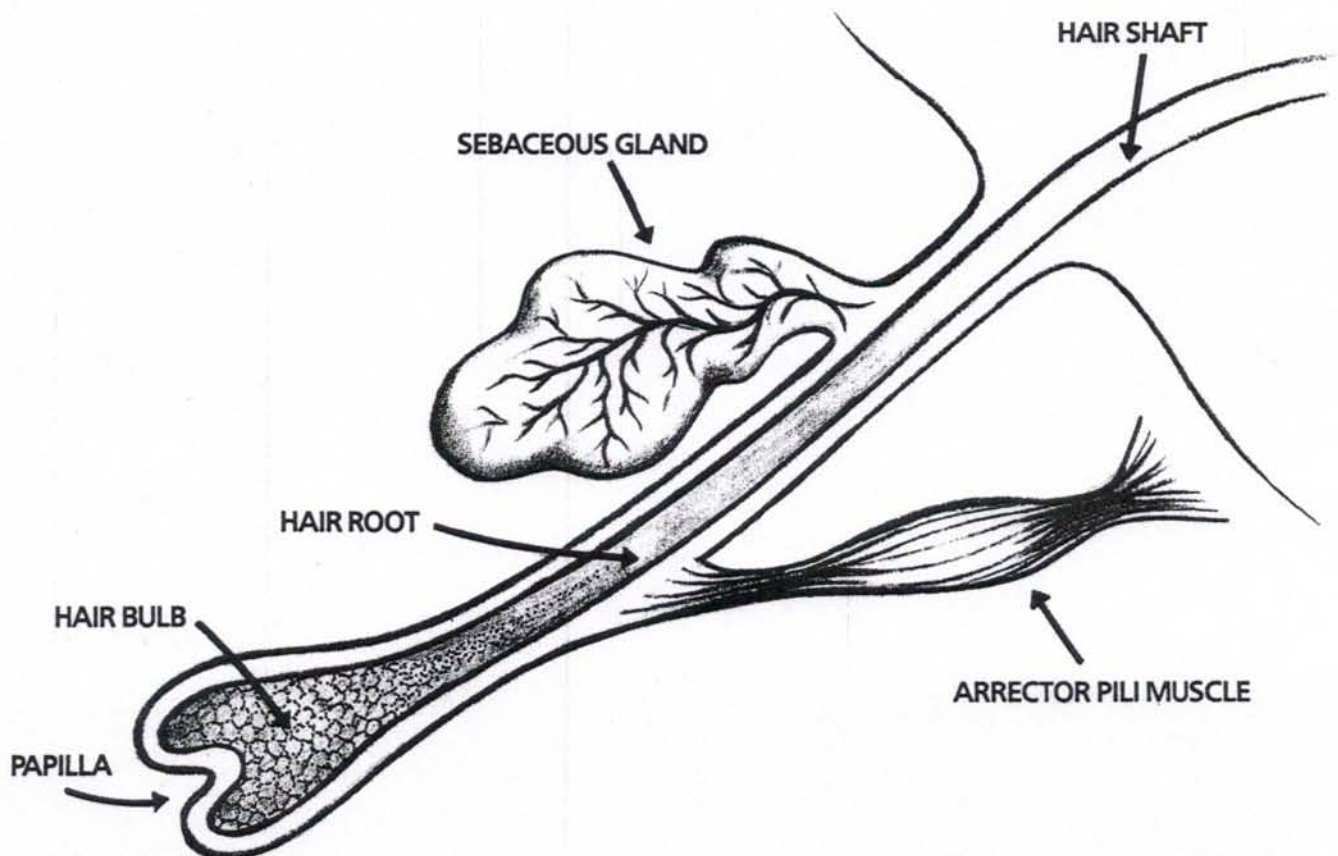
You must inspire confidence in your clients. They will look to you as a professional to help them make the correct decision on haircoloring. You must choose and explain the technique to be used in each particular instance.

If all this sounds like a large order, it is. For you, the Professional Hair Colorist, will help your clients to look their best and feel better about themselves. But you need not feel overwhelmed by this awesome responsibility. With practice and the help from the CLAIROL Professional Products Division, you are going to develop your own unique abilities in a way that will be of great value to your clients and satisfying to you. Your growing expertise will enable you to secure continued and satisfied clientele.

## THE STRUCTURE OF HAIR

It is essential, in providing good haircare and coloring, to understand the structure of the hair and its basic physical and chemical properties. In this section, we will describe and explain what you need to know.

We begin by identifying the two main divisions of hair, the ROOT and the hair SHAFT. The ROOT is the part of the hair that is below the skin. The hair SHAFT is the visible part of each strand of hair.



## The Root

A variety of structures are associated with the root. The hair **FOLLICLE** is a tiny tubular indentation in the skin which holds the hair root in much the same way as a flower pot holds the soil, stem and root system of a flower. Each strand of hair has its own **FOLLICLE**. Each strand also has its own **PAPILLA**, a small horseshoe-shaped projection of tissue at the base of the follicle—the outer part of which has a special thin layer of cells that form into the hair, and blood vessels which provide nutrients for the growth of the hair. The hair **BULB** lies just above the papilla, fitting tightly over it.

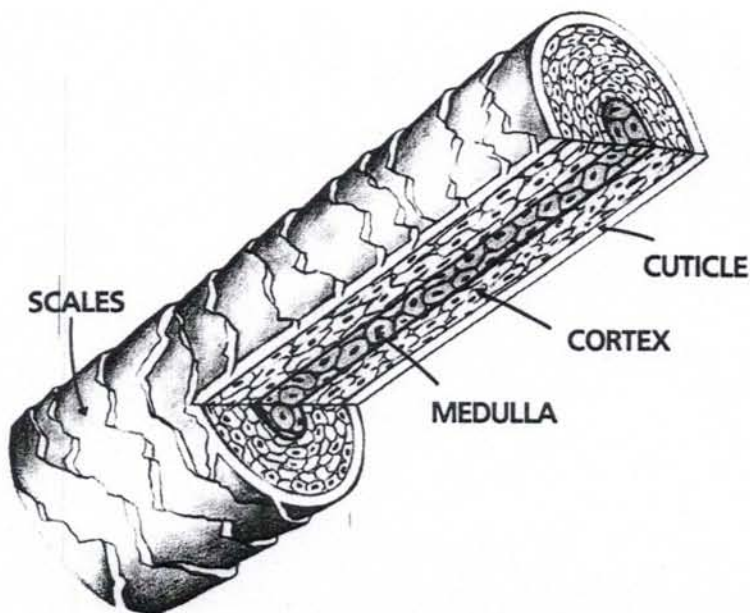
Located in the wall of each follicle are one or more **SEBACEOUS GLANDS**—oil glands attached to each follicle. These glands produce a fatty substance which is essential to maintaining normal lubrication of the hair—a lack of which causes dry hair and too much of which causes oily hair.

The final structure of the root system is the **ARRECTOR PILI MUSCLE**, a small muscle attached to the follicle. Contraction of the muscle pulls the hair upright, and is what causes the hair to "stand on end" when we are chilled.

## The Hair Shaft

The hair **SHAFT** is the part of the hair that is above the surface of the skin. It is the hair shaft which most concerns Professional Stylists and Colorists. Under the microscope, the hair shaft shows three different cell layers—**CUTICLE**, **MEDULLA** and **CORTEX**. The **CUTICLE** is the outer cell layer of the hair shaft. The cuticle is composed of flat cells which lie on the surface of the hair in overlapping formation, much like the shingles on a roof, or the scales of a fish. These cells contain no pigments and are transparent. When we speak of damaged hair, we often mean that this outer layer of the cuticle is damaged.

The **CORTEX** is composed of the cell layers between the cuticle and the medulla and represents the bulk of the hair. The cortex is the most important layer of the hair. It represents from 75% to 90% of the hair's total bulk. The cortex is composed of cigar-shaped cells firmly attached to each other, arranged lengthwise. It provides the bulk of the strength and elasticity of the hair. It determines the texture and quality. The hair's natural color is determined by the pigment in the cortex. The wave pattern of the hair is determined by changes in the cortex as it grows in the follicle. The **MEDULLA** is the pith of the hair, running sometimes irregularly down the center of the cortex. It is composed of vacuolated cells and its chemical character is quite different from that of the cortex.





# Physical Properties

Now you have some basic understanding of the structure of the hair and you are ready to tackle its physical properties—its **TEXTURE**, **DENSITY**, **ELASTICITY** and **STRENGTH**. Porosity and wave pattern are extremely important to the Professional in all phases of haircoloring and haircare.

- Hair **TEXTURE** is defined by the diameter (thickness) of the individual hair strand. It can be coarse, medium or fine—coarse hairs have a thicker diameter and fine hairs have a very small diameter. Hair texture is not related to any particular wave pattern, so that, for example, both fine and coarse hair can be curly or straight. As a general rule, the finer the hair the more quickly it reacts to haircoloring and chemical services, such as relaxing and perming.



COARSE      MEDIUM      FINE

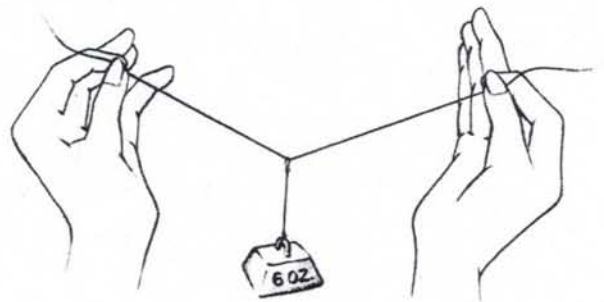
- **DENSITY** is defined by the number of hairs on an individual's head. Thick or thin are the classifications generally used. The average head of hair has 100,000 to 150,000 hairs. There are no clear-cut rules as to the relationship of natural hair color to the number of hairs. Normal daily fallout is from 50-100 hairs.



- **ELASTICITY** is the ability of the hair to stretch beyond its normal length and then spring back. It is one of the primary indicators of the hair's condition. Normal hair has the ability, when wet, to be stretched about one and one-half times its usual length. Dry hair has less elasticity and will stretch about one and one-quarter times its natural length. The elastic qualities of hair are affected by sun, environment, excessive dry heat and chemical services.

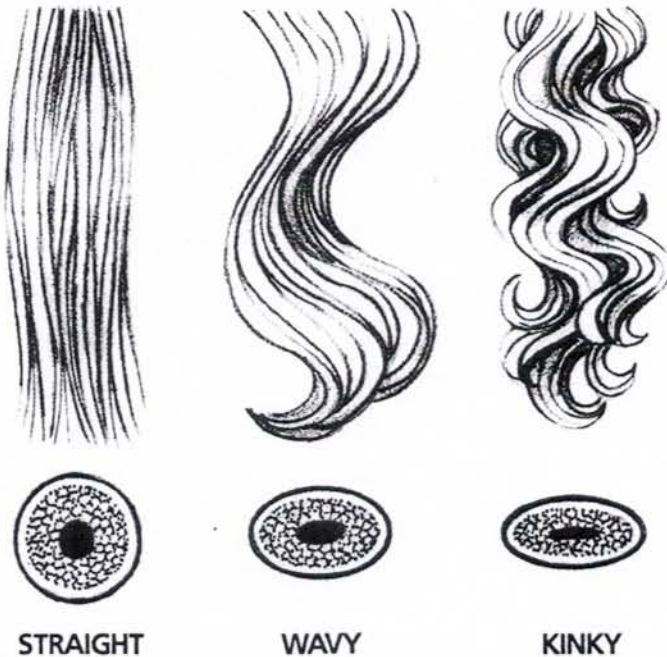


- **STRENGTH** of hair is defined by the amount of pull that it can withstand without breaking. The stronger the hair, the healthier it generally is. A single strand in good condition will support a weight of four to six ounces. The strength of the hair is determined by the condition of the cortex layer. This condition is affected by many factors, such as age, environment and chemical services.



- **POROSITY** is the ability of hair to absorb liquid water. It is a key factor in determining the receptiveness of hair to haircoloring and other specialized services. Both the cortex and cuticle layers are key factors in determining porosity. Hair is sometimes resistant to absorbing the moisture from lighteners, tints and permanent waves.

- **WAVE PATTERNS** appear to be associated with the shape of the individual shaft. Straight hairs are usually round, wavy hairs are oval and curly, kinky hairs can be quite flat. If desired, the wave patterns of hair can be altered by chemical processing—relaxing for overly curly hair and perming for straight hair.



STRAIGHT

WAVY

KINKY

## Natural Hair Color

Natural hair color depends upon the presence, amount and distribution of natural pigment found in the cortex. The presence of either black or red pigment determines whether hair color will be dark or light respectively. For example, light warm brown hair has a greater proportion of red pigment in the cortex. Dark ash brown hair has a greater number of black pigment cells. Hair color is, to a great degree, determined by heredity. For whatever reason, the partial or complete absence of pigment causes gray hair.

## Chemical Properties

Now that we have discussed the structure of the hair and a number of its physical properties, we are ready to discuss its chemical properties. The chemical properties of the hair and hair products are the most critical for a Professional to learn. You should pay special attention to the section on pH. It would be impossible in this short space to list all the chemical properties of hair, but we will discuss those which are important to the Professional.

## Hair Chemistry

Hair is one of the most resistant parts of the body to chemical attack, yet strong alkalis or acids can dissolve or weaken it. Chemicals, such as permanent wave solutions, hair relaxers, hair tints or lighteners can cause damage to the hair if not applied correctly and carefully. The bulk of fiber of hair (over 95% of its weight) is made up of an insoluble protein material called **KERATIN**, which is formed by a process that takes place within the follicle. Keratin protein is composed of some 20 amino acids, of which the cross-linking amino acid **CYSTINE** is the most important.





# pH Scale

This chart clearly indicates and illustrates the pH scale on both the acidic and alkaline sides of solutions. The solutions increase in strength as they move away from the neutral level.

REACTION		pH SCALE	EXAMPLES
A C I D S	STRONG	0	<b>MINERAL ACIDS</b>  Vinegar Rinse Lemon Juice Rinse  Color Rinses Neutralizers  Hydrogen Peroxide (Stabilized) Conditioners Fillers, Acid or Cream Rinse Anti-Dandruff Cosmetics Setting Lotions (New Types) Soapless Shampoos Hair Creams  <b>S A F E  O N  H A I R</b>  Semi-Permanent Rinses Soap Shampoos Setting Lotions (Older Types) Permanent Waving-Relaxing Solutions (Alkaline-Thio Type) Hair Tints Bleaches   Ammonia Chemical Hair Relaxer (Sodium Hydroxide)  Caustic Soda
		1	
		2	
	MILD	3	
		4	
		5	
		6	
NEUTRAL		7	
A L K A L I E S	MILD	8	
		9	
		10	
	STRONG	11	
		12	
		13	
		14	



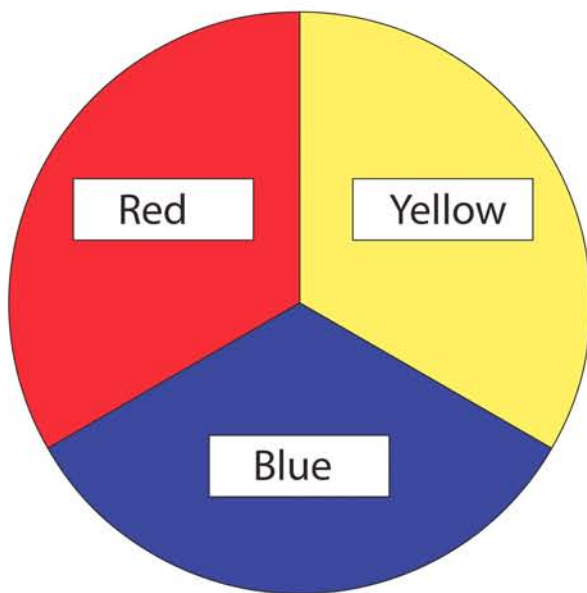
# COLOR THEORY

To best understand the art of haircoloring, you must begin with the basic principles of color. When you were a child, you discovered that mixing red and yellow paints would miraculously produce orange. And, although you've come a long way since those early paint-box experiments, it is the Professional Colorist in you who must apply such basic color theory to today's sophisticated coloring techniques. Just as an artist must have a clear understanding of colors and how they react when combined, so must

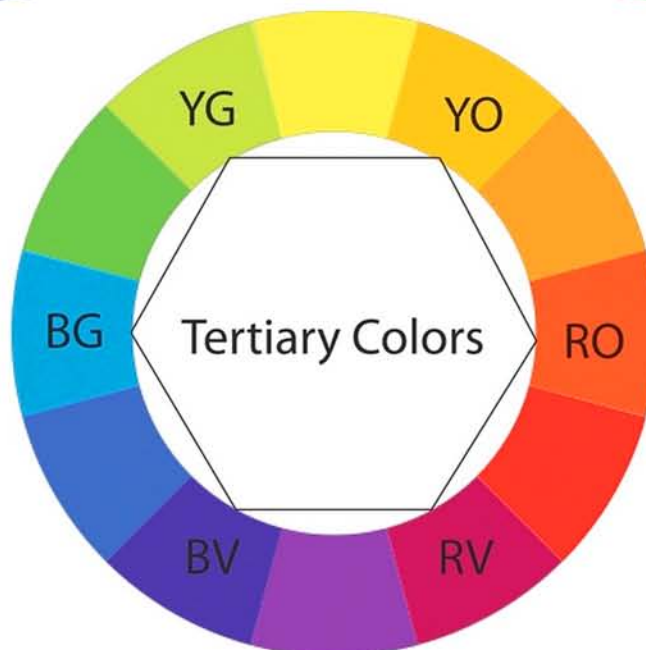
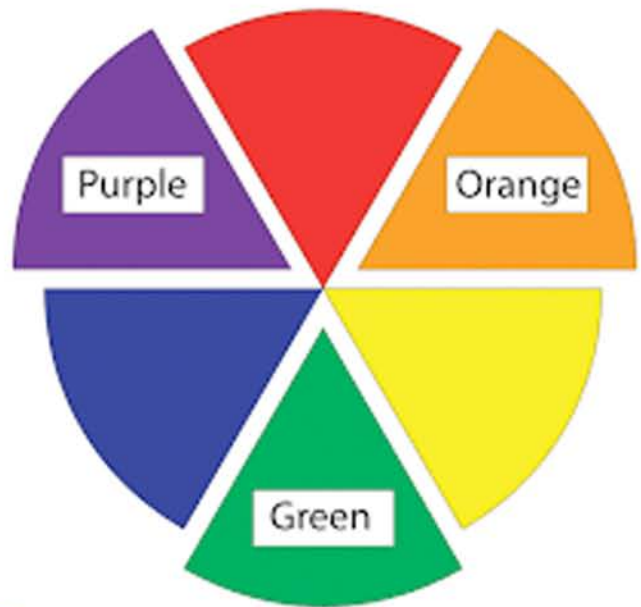
the Hair Colorist have a working knowledge of color theory. This extremely important knowledge will help you determine the best possible shade for your clients and avoid problems. Or, when problems do crop up, you will know how to neutralize or adjust them.

While some of the materials contained here may seem very basic—you may remember it from an art class in grade school—by reviewing it now, you will be able to see how it relates to haircoloring.

## Primary Colors



## Secondary Colors



## Primary Colors

At the mention of color, we immediately visualize a wide range of shades. Actually, there are only three PRIMARY COLORS out of which all the others are formed. The three PRIMARY COLORS are red, blue and yellow.

## Secondary Colors

When equal amounts of any two primary colors are combined, you get the SECONDARY COLORS. Yellow and red combine to form orange; red and blue combine to form violet; and blue and yellow combine to form green. The SECONDARY COLORS are violet, orange and green.

## Tertiary Colors

TERTIARY COLORS are made by mixing equal proportions of the primary colors with their immediately adjacent secondary colors. The six TERTIARY COLORS, therefore, are yellow-green, blue-green, blue-violet, red-violet, red-orange and yellow-orange.

Not only can we combine colors to create new colors, we can combine colors to neutralize, or counteract one color with another. Knowing how to neutralize or counteract one color with another is just as important as knowing how to create color. Consider the following combinations based on the color wheel: equal amounts of all three primary colors mixed together will produce black, as shown in the middle of the color wheel. When they are mixed together in unequal proportions, they will produce brown. The shade of brown will vary according to the proportions of primary colors used. For example, more red will create a brownish red, more yellow a light brown and more blue a cool brown.

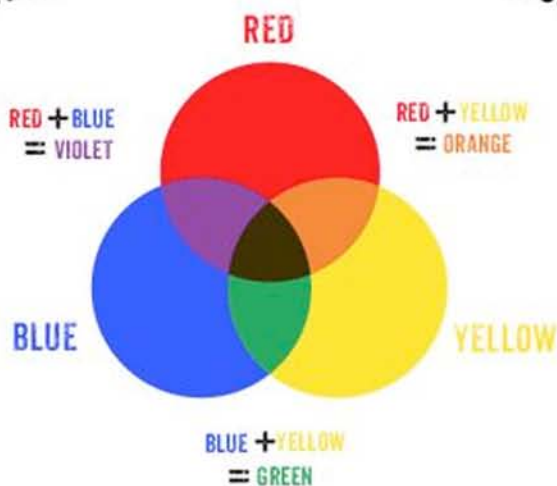
Colors in opposite positions on the color wheel are known as COMPLEMENTARY COLORS. When mixed, they create neutral brown shades, bearing no resemblance to the original shades mixed. For example, red and green are opposites on the color wheel. Mix them equally and you will get a neutral cool brown that resembles neither red nor green. This becomes easier to understand when we realize that green is a mix of blue and yellow and when added to red produces the combination of the three primary colors: blue, yellow and red, which, as we have seen, neutralize one another. The same holds true when violet is mixed with yellow, its opposite on the color wheel, or when orange is mixed with blue.

So far we have been mixing colors at their full color value. What happens when we mix primary colors with an equal amount of white? The result is a half-tone of the original color. Mix equal proportions of half-tone blue and half-tone red and the results will be a half-tone violet, or a light violet. Now imagine the three primary colors lightened by the addition of white to the lightest possible degree, but still containing perceptible color. When mixed together equally, these three pale tones of the primary colors will produce a very pale gray, or almost white.

It is important to note that the laws of color we have given here refer to colored pigments. Laws of color when we are dealing with colored lights have different properties.

Now while you, as a Hair Colorist—like the artist—must have a clear understanding of color theory, you must also have an understanding of the color properties of hair itself.

### WHAT HAPPENS WHEN YOU MIX COLORS?



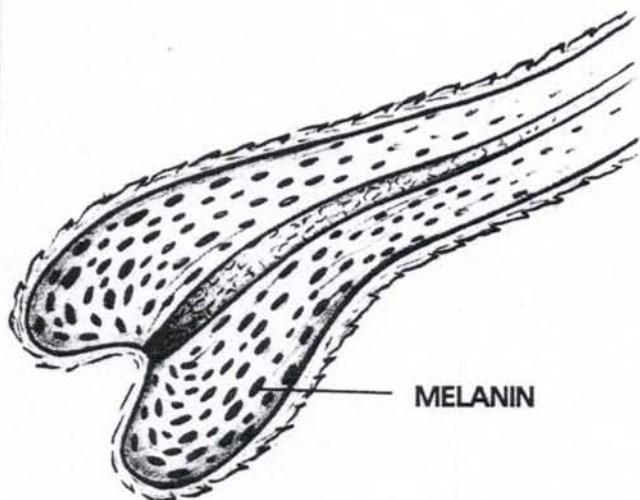


## Pigment

Natural hair color depends on the presence of **PIGMENT** within the cortex layer of the hair shaft. **PIGMENT** is coloring matter within the cortex layer of the shaft. Natural hair pigment is called **MELANIN**. It is thought to be formed by spontaneous action of the enzyme, tyrosinase, on the amino acid, tyrosine, a colorless substance which is found in the papilla. As the hair grows upwards in the follicle, the melanin is carried upwards in the cortex with the new growth in the form of small granules.

There are an infinite variety of hair colors. Hair color varies not only between different individuals, but also between different hairs on the same scalp, and even on different parts of the same strand. This fact seems less complicated once we understand that all these various shades can be considered as different combinations of the two natural types of pigments—black and red.

The quantity of a pigment, its distribution inside the hair and its chemical characteristics determine the color of each strand.



## Depth of Color

The cortex of all hair has both granular and diffused pigment. Dark hair has more granular pigments and we say it has a greater **DEPTH OF COLOR**. Blonde or red shades have more diffused pigment, and we say it has a lighter **DEPTH OF COLOR**. **DEPTH OF COLOR** refers to the lightness or darkness of a color.

## Tone

Hair which has greater amounts of yellow-red pigment we call warm in **TONE**, while hair with lesser amounts of yellow-red pigment we call cool in **TONE**. The **TONE OF HAIR COLOR** is the degree of warmth or coolness of a color.

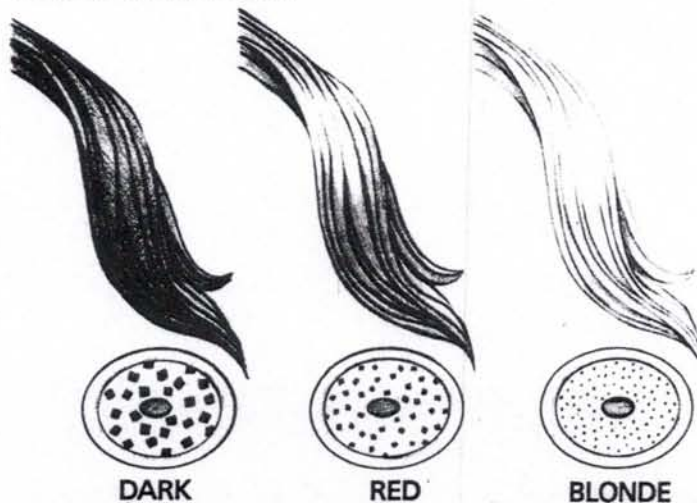
## Hair Shades

We can use the above terms to help describe the variety of hair shades. We can say, for example, that someone has hair which is dark and warm, dark for depth and warm for tone; or, on the other hand, hair that is light and cool, light in depth and cool in tone.

Dark hair or dark pigment is more dominant than light hair or light pigment. And, since hair color is determined to a great degree by heredity, if one parent of a child has dark hair and the other parent light hair, the dark coloring will dominate so that the child will most probably have dark hair.

Gray hair is produced by partial or complete absence of pigments. The remaining pigment granules are irregularly distributed throughout the hair. New gray or white hairs grow from follicles where dark hair has been shed and, in some cases, dark hair grows out of follicles where formerly white or gray hair has been observed. Graying is not necessarily due to aging; it can also be attributed to genetics or serious illness.

If clients come into the salon asking to have their hair returned to its original color, it is necessary to take into consideration skintone. Skin coloring, like hair, can change, and it may be advisable to suggest a shade of haircoloring slightly different from the original color.



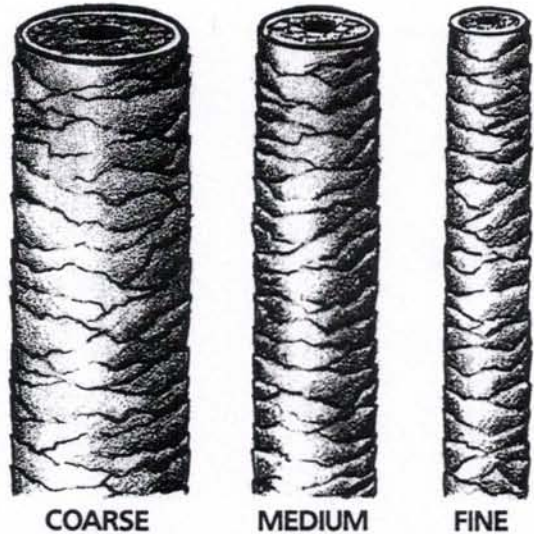


## Porosity

One other factor must be taken into account before we begin our study of actual hair coloring, and this is the porosity of the cuticle. To review very quickly, we know that the cuticle is actually a clear protective layer designed to guard the more delicate cortex from injury. It is in the cortex that natural pigment is found. With tinting, in order for hair coloring to appear natural-looking and long-lasting, the coloring must penetrate inside the hair cortex. That's what gives good coloring its "lifelike" look. In modern permanent hair coloring, the molecules of color are very small so that they can readily pass through the cuticle and enter the cortex. Once in the hair, the color base-ingredients begin to interact and form molecular pigment chains which are too large to pass out through the cuticle's scales. They are trapped within the hair, making the tinting process a permanent change. Occasionally, when hair is resistant, it must first be softened to allow the tint to penetrate.

The cuticle can be damaged, however, by excessive lightening, too frequent or badly administered permanent waves, or by exposing hair to harsh chemicals. In such cases, the cuticle becomes over-porous and requires special treatment.

Occasionally, due to an over-porous condition, a tint or toner shade will finish too cool. This may be due to the fact that the red color molecules used in tints and toners are usually the smallest used in color blending. The porous openings in the hair shaft will allow many of these tiny color molecules to pass through the hair shaft and wash away. Larger color molecules will remain in hair, creating an unbalanced color. The method you use to avoid this problem is to apply a color builder such as CLAIR-FILL. You would then select a CLAIR-FILL shade with a high concentration of red and red-gold tones.





# THE HISTORY OF HAIRCOLORING

No one is certain just how long people have been coloring their hair because haircoloring has been popular at least as long as history has been recorded. It is possible, perhaps, that even in the days of the cavemen, women were coloring their hair in a manner similar to those still practiced by primitive tribes. Today, we do know that the ancient Egyptians were coloring their hair thousands of years before the birth of Christ.

## Plant Dyes

In those days, the favorite coloring products were the by-products of certain plants and small shrubs which grew wild in the desert. When prepared into a thick paste, these plant parts released a dye, which could then be used to coat the hair shaft with color. Among those most commonly used in this way were henna, indigo, sage and camomile—all of which proved to be very messy undertakings with unpredictable results. Later, when the Romans were in power, new techniques for coloring and lightening became the rage. So far-reaching was

the Roman Empire during its Golden Age that slaves and captives who were brought back were often from races unfamiliar to the conquerors. The predominantly dark-haired Romans were so awed by the beauty of the fair-haired Teuton captives that they bleached their own hair with saffron, red arsenic, nutshells and the ashes of plants in an attempt to recreate this look for themselves. Even the golden beauties of the Renaissance were not all natural blondes. Many of them wet their hair with soaps and exposed it to the sun or mixed alum, black sulphur and honey to lighten and tone their hair so it looked the way it does in the Old Masters' paintings.

