Townsend Letter
The Examiner of Alternative Medicine

**From the Townsend Letter,
the Examiner of Alternative Medicine
February/March 2006**

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Health Risks and Environmental Issues
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Makeup's Ugly Secrets

The 35 billion-dollar cosmetic industry is one of the nation's largest and most profitable enterprises, spending more money on television advertising than any other business. Contrary to what most consumers believe, the Food and Drug Administration (FDA) neither tests nor determines the safety of cosmetics and toiletries. The cosmetic industry is self-regulating through an independent panel of experts whom it appoints.[1,2]

"Skin Deep" is the title of an investigative report prepared in 2004 by the Environmental Working Group (EWG), an advocacy organization based in Washington, DC. The EWG examined 711 lipstick products and found that 28% contained ingredients associated with cancer risk from chemicals like butylated hydroxytoluene, Nylon 6, ferric oxide, polyethylene, and titanium dioxide.[2]

Toxins in Makeup

All cosmetic products contain a certain amount of bacteria, prompting manufacturers to add preservatives. Parabens are toxic and allergenic synthetic chemicals used extensively as preservatives in cosmetic products. Aubrey Hampton, of Aubrey Organic Cosmetics, informs us that preservatives are not added to protect the consumer from bacteria, however, but to extend the shelf life of the product.[3]

Toxic metals can be found in moisturizer, lotion, sun block, sunscreen, mascara, eye shadow, rouge, face powder, lipstick, and theatrical and clown makeup. Health

effects may include nausea, cramps, vomiting, skin rash, joint and bone pain, mouth sores, cancer, stillbirths, genetic damage, immune dysfunction, brain and learning disorders, and impulsive and violent behavior.[4] These toxins in makeup are numerous and include the following:

Mercury compounds are permitted by the FDA for use in eye makeup at concentrations up to 65 parts per million (p/p/m). Awareness of mercury contamination in fish, vaccines, and dental amalgams is increasing. Old mercury-filled thermometers are being phased out and substituted with new mercury-free thermometers to avoid environmental and health risks. (Several schools have even been forced to close down because of mercury spills from broken thermometers.) Yet with all the evidence about mercury's toxicity, how many women and teenagers have been warned about toxic mercury in eye makeup?[5]

Mercury is both a deadly poison and a heavy metal. The skin easily absorbs mercury, and it accumulates in the body.[3]

Mercury exposure also may cause allergic reactions, skin irritation, or neurotoxicity problems. Phenyl mercuric acetate is a highly toxic chemical used as a preservative in eye makeup, even though it does not protect the consumer from bacteria in products that have become contaminated by use.

Bronopol is used in mascara and other cosmetics. A skin irritant, bronopol has caused blindness and death in laboratory animals at concentrations much higher than used in cosmetic products.[3]

Formaldehyde-releasing ingredients are found in nearly all brands of skin, body, and hair care products, antiperspirants, and nail polishes. Imidazolidinyl urea and DMDM Hydantoin are just two of many preservatives that release formaldehyde, which can
irritate the respiratory system, cause asthma, allergies, or skin reactions, even trigger heart palpitations. Formaldehyde exposure can cause joint or chest pain, depression, headaches, fatigue, dizziness, immune dysfunction, and cancer.[6]

Hexamethylenetetramine is a carcinogenic formaldehyde-compound used in lotions and creams, and must carry a warning label if used in concentrations greater than 0.05%. Trade names: Aminoform, Formid, Uritone, and Cystamin.[3]

Lanolin, a fatty secretion from sheep's wool, is found in many cosmetics. Although lanolin is a natural product, it may be contaminated with DDT and other pesticides used on the animals.[1]

Mineral oil is used as an emollient to prevent water loss from skin, but can be

toxic and actually dries out skin.[3]

1-Naphthol and 2-Naphthol are coal tar derivatives used as dye intermediates. They can be absorbed through skin and are skin irritants. Oral doses larger than one teaspoon can be fatal.[3]

Nitrosamines are a class of carcinogenic compounds that can be absorbed through skin. Nitrosamines are by-products created by the chemical reactions of many cosmetic ingredients including 2-bromo-2-nitropropane-l,3-diol, cocoyl sarcosine, Diethandamine (DEA), Imidazolidinyl urea, formaldehyde, hydrolyzed animal protein, Lauryl sarcosine, Monethanolamine (MEA), Quaternium-7,15,31,60, etc., Sodium Lauryl (or Laureth Sulfate), Sodium methyl cocoyl taurate, Triethanolamine (TEA). However, vitamins C and E act as blocking agents, inhibiting the toxic effects of nitrosamines, and some manufacturers add vitamins C and E to their products for this purpose.[3,7]

p-Hydroxybenzoic Acid Benzyl Ester (PHB Esters), are widely used preservatives more commonly known as methyl paraben, propyl paraben, ethyl paraben, and butyl paraben. They are highly toxic, causing skin rashes and can behave as xenoestrogens, raising the risk of breast cancer in women and low sperm count in men.[3,7]

Petrolatum (petroleum and paraffin jelly) is a type of mineral oil used in baby oil, creams, lipstick, makeup remover, and lip-gloss. This type of waxy mineral oil sits on top of the skin, clogging the pores which leads to blackheads, whiteheads, and eventually, enlarged pores.[7]

Propylene Glycol is a petroleum derivative found in most forms of makeup and other cosmetics as a humectant (moisture retainer), surfactant (oil emulsifier), and solvent. Its industrial uses include hydraulic brake fluid and antifreeze. This additive causes allergic and toxic reactions in some individuals. Surprisingly, it is an ingredient in many products claiming to be "natural." Because of Propylene Glycol's ability to quickly penetrate skin, the U.S. Environmental Protection Agency (EPA) requires workers to wear protective clothing, gloves, and goggles when working with this toxic chemical. The Material Safety Data Sheets (MSDS) warn against skin contact because of possible brain, liver, and kidney abnormalities. Unfortunately, consumers are neither protected, nor warned against health risks. Stick deodorants have concentrations higher than most industrial applications.[3,6]

Quaternium-15 is a toxic agent used in cosmetic creams. Quaternium-15 can cause skin rashes and allergic reactions. Trade names: Dowicil 200, Dowicide Q, and Preventol.[3]

Sodium Lauryl Sulfate (SLS) is a surfactant, detergent, and emulsifier used in thousands of cosmetic products and industrial chemicals as a cleansing agent. It has a degenerative action on cell membranes and is damaging to hair and skin. High levels of skin penetration may occur at even low-use concentrations. Because it is derived from coconuts, SLS is implied to be "natural," but it is mixed with sulfur trioxide or chlorosulforic acid and then neutralized with aqueous sodium hydroxide (lye). SLS is often combined with triethanolamine (TEA) which may be contaminated with the potent carcinogen, nitrosamines.[8,3]

SLS is used in labs around the world as a skin irritant to evaluate the healing potential of ingredients used on the SLS-irritated skin. Permanent eye damage has been observed, as well as residual levels of SLS in the heart, liver, lungs, and brain from skin contact. It may be damaging to the immune system. SLS's protein-denaturing properties can inflame and separate skin layers.[8] SLS is used in nearly every shampoo, cleanser, and toothpaste, including many products sold in health food stores.

Sodium Laureth Sulfate (shortened from Sodium Lauryl Ether Sulfate or SLES) is a yellow liquid detergent similar to Sodium Lauryl Sulfate, with higher foaming ability. SLES is considered slightly less irritating than SLS.[3,8]

Talc – used in face powders and baby powders – can cause lung problems. Talc may be contaminated with asbestos.[3]

Triethanolamine (TEA) is widely used throughout the cosmetic industry and is frequently found in so-called "natural" products as an emulsifier, pH adjuster, and preservative. TEA is a synthetic chemical that can be contaminated with potent carcinogens called nitrosamines.[3]

Color Additives date back as far as 5000 years. The desire to improve one's appearance is not a modern concept. Artificial colors and dyes are now included in nearly every cosmetic product. The FDA lists two categories of color additives: coal-tar dyes derived from petroleum, and colors exempt from certification – primarily obtained from mineral, plant, or animal sources.[9]

Many coal tar derivatives are suspected carcinogens, and most artificial colorants have not yet been tested for cancer risk. About 76 D&C (approved for use in Drugs and Cosmetics) color pigments, and approximately 19 FD&C colors are used in food and toiletries. Ext. D&C approved colors are approved only for use in externally applied drugs and cosmetics. Six FDA "certified" colors are suspected carcinogens. Others may cause hives, eye irritation and permanent blindness, behavior problems, emotional outbreaks, attention deficit disorder (ADD),

chromosome damage, and reproductive mutations. Absorption of certain colors can cause oxygen depletion of the body resulting in death.[1,4,6,9]

Certification in regard to coal tar pigments only regulates the amount of metallic impurities from lead and arsenic, and is not intended to protect the public from toxic synthetic chemicals. Dyes may also be contaminated with aluminum and other toxic metals to give a shine to makeup.[1,4,9]

Exposure to color additives and dyes is a 24-hour experience in modern society, including multiple uses of soap, skin cream, shampoo, conditioners, shaving cream, toothpaste, body lotions, and makeup (including lipstick, mascara, eyeliner, face powders and more). The FDA assures consumers that color additives are safe for their intended purposes, despite removal of some questionable colors in the past.[9] FD&C yellow No. 5 (listed as tartazine on medicine labels) is used in beverages, desserts, drugs, makeup, and many other product, and has caused itching and hives in some sensitive individuals. Since 1980 (for drugs), 1981 (for foods), the FDA has required all products containing No. 5 to be listed on labels.[9]

Fragrance chemicals are added to cosmetics and toiletries. Fragrance on a label can indicate any of 4,000 individual ingredients, nearly all synthetic. Fragrance exposure can affect the central nervous system, causing depression, hyperactivity, irritability, inability to cope, and other behavioral problems. "Fragrance-free" and "unscented" products may still contain fragrance chemicals without listing them on the label. Eight to 90% of fragrance chemicals are petroleum derivatives that can enter the body through inhalation, skin, or ingestion, and go directly to the brain. The EPA considers fragrance, second-hand smoke, and formaldehydes as triggers for asthma, while the FDA lists fragrance as the primary cause of allergic skin reactions to cosmetics.[1,9]

Skin

Rodney Dangerfield, the comedian, might have said, "Skin gets no respect." And that would be no joke. We expose our skin to harsh weather conditions and products containing toxic petroleum derivatives that are drying, irritating, and pore-clogging. Alcohols and solvents destroy the skin's pH balance, stripping away the skin's defense barrier to infection while contributing to wrinkles, fine lines, spots, red veins, or other discolorations. Dr. Susan Lark reminds readers of her *Health Letter* that skin is a "living, breathing, blood-circulating organism" that must be treated with the same care we'd give our heart, liver, and lungs. In fact, Chinese medicine considers skin to be the "third lung." [7,10]

Contrary to previous beliefs that skin was impermeable, we now know that skin easily absorbs chemicals, hence the nicotine patch, nitroglycerine patch, and birth control patch. Toxic chemicals in makeup, personal care products, commercial,

industrial, hobby, and household products are also absorbed into the bloodstream through dermal contact. Skin is a two-way membrane, and the body's largest organ of elimination via perspiration, which is why saunas are so healthful in ridding the body of unwanted toxins.[11]

Skin is composed of three layers: the epidermis, the dermis (cutis), and the subdermis (subcutaneous). The epidermis has no blood vessels, but contains many small nerve endings, and its outermost layer is constantly shedding and being replaced. The middle layer, dermis or cutis, is highly sensitive with a vascular layer of connective tissue containing blood vessels, lymph vessels, nerve endings, sweat and oil glands, hair follicles, *arrector pili* muscles, and *papillae*. The subcutaneous tissue makes up the third layer of skin. It is adipose (fatty) tissue, necessary for energy. The subcutaneous tissue acts as a protective cushion for the outer skin, hair, and nails.[3]

Sebum is a complex oil released onto skin to slow down water evaporation while preventing excess moisture from penetrating into the skin. Exposure to wind and cold have a drying effect on skin. Mineral-oil based creams appear to be helpful, but eventually inhibit the skin's natural moisturizing process, which is also adversely affected by solvents, detergents, and chemicals in makeup including sodium lactate, sodium pyrolidone, carboxylic acid (NaCPA), and collagen amino acids.[3]

Exposures to toxic chemicals add up. According to a survey by the EWG and a coalition of health advocacy organizations, the average American adult uses nine personal care products daily containing a total of 126 unique chemical ingredients. The survey also revealed the following:

- 12.2 million adults are exposed to known or probable human carcinogens through daily use of personal care products.
- 4.3 million women are exposed daily to toxic ingredients linked to fertility impairment and fetal development problems.
- 20% of all adults are exposed daily to the top seven carcinogens commonly found in personal care products: hydroquinone, ethylene, dioxide, 1,4-dioxane, formaldehyde, nitrosamines, PAHs, and acrylamide.
- Women use more cosmetics and personal care products than men and are exposed to more unique ingredients daily.[12]

Labels

The cosmetics law requires that product labels list ingredients in descending order of predominance in a manner easily read and easily understood under normal conditions of purchase. In reality, labels are not easy to read or understand. Labels include complicated scientific terms for myriad synthetic ingredients, terms

intelligible only to a chemist.[13]

The EWG found 13,900 unique ingredient names listed on the labels of 14,200 products. Misspellings and synonyms reduced the actual number of ingredients to just over 9,800 unique chemicals. Approximately half of all ingredients were mislabeled. The EWG found 22 different spellings of the botanical ingredient, "witch hazel." The EWG also revealed that several cosmetic companies failed to disclose ingredients for products sold online via their web sites.[13]

Drugs are heavily regulated; cosmetics are not. Both share common intentions and, often, common ingredients as well. Many cosmetic ingredients are designed to penetrate skin, and many drugs and cosmetics contain the same biologically active ingredients. Indeed, many cosmetics fall into a gray area FDA calls "cosmeceuticals," products that are half drug, half cosmetic.[13]

The cosmetic industry spends billions advertising what ingredients have intentionally been added to their products, but does not provide consumers with accurate information alerting them to carcinogenic contaminants or preservatives that release formaldehyde. The FDA acknowledges that many cosmetic companies lack adequate data on safety tests and that some companies have even refused to disclose test results. Out of approximately 5,000 cosmetic distributors a miniscule three percent have filed reports with the government of injuries to consumers.[14]

The National Institute of Occupational Safety and Health claims 884 chemicals available for use in cosmetics are toxic substances. The FDA has no resources for assessing the safety of these chemicals, which cause genetic damage, biological mutation, and cancer. Mainstream brands of personal care products and makeup contain a wide range of undisclosed carcinogenic ingredients and contaminants.[14]

Despite the FDA's failure to adequately regulate the safety of personal care products, the industry assures the public that its voluntary self-regulation ensures the safety of products available in the marketplace. A major provision of the cosmetics law claims the following: "Each ingredient used in a cosmetic product and each finished cosmetic product shall be adequately substantiated for safety prior to marketing. Any such ingredients or product whose safety is not adequately substantiated prior to marketing is misbranded unless it contains the following conspicuous statement on the principle display panel: Warning – The safety of this product has not been determined."[13]

When asked by EWG volunteers if any product labels carry this warning, industry spokespeople replied in the negative, indicating companies are not allowed to sell products with unsafe ingredients and would not risk violating the law. However, the FDA admits it has little to no authority to enforce provisions of the law

requiring manufacturers to substantiate the safety of products being sold. Safety testing is optional, and companies can operate for the most part without fear of retribution.[13]

The EWG spent two years reviewing more than 20,000 product labels and did not find even one product that carried a warning.[13] Considering the FDA's repeated failure to protect consumers from the side effects of patented drugs, including death, how can the public possibly retain confidence in the agency's ability to protect against harmful ingredients in personal care products and makeup?

FDA Admits Failure in Cosmetic Safety

The EWG filed a cosmetic safety petition in June 2004. In September 2005, the FDA issued its written response revealing serious deficiencies in its power to protect public health, admitting its inability to require warning labels on products with safety concerns. The FDA even lacks the ability to recall harmful products, relying solely on voluntary company actions.[15]

Consumers are generally shocked to learn that cosmetic ingredients have not been tested or proven safe. To say the American public has been misled in this regard is an understatement. A coalition of grassroots organizations is finally spearheading a movement to protect American consumers from toxic ingredients in personal care products and makeup.

Next month's column will cover some of the worst and best brands of makeup, a review of new laws being adopted in other countries and some states in our own country, and actions consumers can take to protect themselves.

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March 19, 2006