

There is nothing like a cancer diagnosis to make you sit up and pay attention to every chemical going near your body.

The thing I found extra terrifying, not to mention confusing, when I was diagnosed with breast cancer is that *I was already paying attention*. I've been eating organic for more than ten years and using natural and biodegradable personal care products for several years as well. So what was the problem? I had assumed that my clean, green lifestyle would inoculate me against an illness like cancer.

All these months after my treatment I've long since given up trying to pinpoint which act, which habit, which choice gave me cancer. That, I now see, is a frustrating exercise that yields no clear answers. The truth is that I may well have developed breast cancer because of something my grandmother used in *her* kitchen or bathroom. It's possible that some crazy chemical that they thought was safe back then muddled my grandmother's DNA in such a way that, two generations later, my cells started going rogue. Who knows?

Although for a few frightening moments I thought my cancer diagnosis was a slap in the face to my attempts to have a chemical-free lifestyle, the truth is that it actually makes it even clearer how critical our choices are—for ourselves and for our children. And even for *their* children.

## The Chemical Body Burden

Out of all the information on these pages, there are three little words I sincerely hope readers will understand more clearly after reading this book: *chemical body burden*.

Chemical body burden refers to the accumulation of chemical ingredients in the human body. It is an unknown variable in modern health, and it is largely undiscussed in mainstream medicine. But almost certainly, the untold combinations of chemicals building up in our bloodstream and organs, based on generations of synthetic

exposure, have an impact on our bodies' ability to function in top form.

Those of us born after the Second World War are unwitting participants in a chemical research trial. As a result of enormous government subsidies for the petroleum industry during the war, the decades that followed saw petrochemicals and plastics (which are also petroleum-derived) become the building blocks of the economy. Unfortunately, ever since we figured out how to use chemistry to remove stains, staunch odours, and boost shine, we've been on the receiving end of some alarming health problems. If you track the increase in use of petrochemicals and the increase in cancer rates, allergies, asthma, and birth defects since the end of the war, you will notice a chilling parallel.

I am not suggesting there's an evil conspiracy afoot, or that any individual or corporation is determined to systematically eliminate the human population through the use of unsafe chemical ingredients. Most of these chemicals were simply developed with an eye for efficacy and cost, not health and safety. It may seem odd in retrospect, but there it is.

Consider Rachel Carson's famous book *Silent Spring*. It was one of the foundations of the environmental movement and was recently named among the top twenty-five science books of all time. A science-based argument against using chemical pesticides, the book was a passionate cry for change when it was published in 1962. Carson accused the chemical industry of spreading disinformation, and she blamed industry regulators for too blithely accepting industry propaganda. As commonplace as her convictions may be today, in the early 1960s they were a jolt of sobriety in a booming chemical age. Though Carson was writing primarily about agricultural pesticides, the same concern applied to chemicals for household and consumer use as well.

In 1976, the U.S. government did finally pass the Toxic Substances Control Act. Unfortunately, it is tougher in name than in action. In addition to being short on scrutinizing the safety of new chemicals, the act gave chemicals in use before 1976 a free pass, not requiring any tests to prove their safety. Any chemical already on the market before 1976 was grandfathered into acceptable status and allowed to remain in use. Many of those same chemicals are still in use today.

In Canada, cosmetics are regulated under the Food and Drugs Act, although the section of applicable clauses within the act is very small, limited mostly to sanitation standards. In 2006, it became mandatory for all cosmetics sold in Canada to be clearly labelled with a list of all ingredients, located on the outside of the package.

Health Canada approves approximately 1000 chemicals and polymers each year that manufacturers and importers want to introduce; in the United States that number is closer to 2500 each year. As you can imagine, adding thousands of new chemicals to the marketplace annually makes it virtually impossible to keep track of their cumulative effects and interrelations.

As I mentioned in the Introduction, even if research is done on certain chemicals used in certain products, and even if you believe that the 3 percent safe levels of ingredient X in your favourite soap or lotion or shaving cream are, in fact, safe for human use, we have no way to measure the impact of that ingredient combined with every other chemical you encounter day after day, year after year. Very few long-term studies are done on the chemicals used in our personal care products, and safety tests are typically performed on animals, not humans. No research is available on what is referred to as the synergistic effect of them all—what I like to call the cocktail effect. Mix together a little propylene glycol in your shampoo with a dash of coal tar in your eyeshadow, tossed in with the phthalates in your scented hand soap (never mind the perfluorocarbons in your non-stick frying pan), and what do we have? Well, no one really knows.

But when research does show that each morning the average woman has applied 126 different chemicals, many of which are known toxins, then ... we need to pay attention.

## Be Your Own Advocate

I wrote this book because consumers need to educate themselves about what labels mean, about what ingredients really are. If you think that Health Canada or the U.S. Food and Drug Administration (U.S. FDA) or any other regulatory body is doing its due diligence on the long-term health impacts of every ingredient in your bathroom cabinet, you are wrong.

According to Stacy Malkan, author of the book *Not Just a Pretty Face: The Ugly Side of the Beauty Industry*, “the U.S. Food and Drug Administration does not have the authority to require companies to safety test personal care products before they go on the market and cannot even recall defective or possibly harmful cosmetics.” It is shocking to read claims that a U.S. government regulator doesn’t actually check to see what’s in the products being sold. It took me just a few minutes to confirm the information: a cursory look at the FDA website reveals this statement: “Cosmetic products and ingredients are not subject to FDA premarket approval authority, with the exception of color additives.”

The FDA regulates products only *after* they are sold, investigating complaints when they are made. The agency also has the rather suspect protocol of tracking safety problems through its Voluntary Cosmetic Registration Program, in which cosmetics manufacturers *voluntarily* report to the FDA the types of adverse reactions their customers have reported to them.

Added to this maverick system of safety monitoring is the Cosmetic Ingredient Review (CIR), a watchdog body that oversees the industry. The problem is that the review panel is funded by the cosmet-

ics industry trade association (the Personal Care Products Council). Jane Houlihan is vice-president of research for the Environmental Working Group, a respected non-governmental organization. A report based on her testimony to the U.S. Subcommittee on Health of the Committee on Energy and Commerce explains how the CIR lobby group systematically dismisses, denies, and discredits any studies or claims about cosmetics posing health risks. Who can the consumer believe?

Even the government agencies that manage public health cannot be counted on to aggressively seek answers. Dr. Michele Brill-Edwards was a senior physician with the Health Protection Branch of Health Canada until she resigned in 1996 and blew the whistle on the undue influence of pharmaceutical interests in Canada's national drug safety systems. In the 2007 National Film Board documentary *Toxic Trespass*, Brill-Edwards explains the agency culture of the four Ds when it came to dealing with any allegations of unsafe products in the marketplace: deny, delay, divide, discredit.

For example, a report from the Public Affairs Department of the U.S. FDA states that a chemical used to remove artificial nails, called acetonitrile, is known to cause death in children who swallow it. When confronted with this research, the U.S. government's response was not to ban, restrict, or replace the toxic chemical ingredient, but rather to create child-resistant packaging. As the FDA itself admits on its website, however, "the fact that a product is in 'child-resistant' packaging does not mean that a child could not open it."

The FDA does provide some words of caution regarding use of personal care and cosmetics products. Try not to drop this book as you break into hysterical laughter at the following government regulatory suggestions regarding consumer safety and protection:

- *Don't drive and apply makeup.* It's easy to seriously injure your eyes if you make a sudden stop or hit a bump.

- *Never add liquid, especially saliva, to cosmetics.* It can cause bacterial growth.
- *Throw away any discoloured or bad-smelling cosmetics.* It could be a sign that the preservatives have degraded and bacteria is present.
- *Don't use eye makeup when you have an eye infection.* Throw out any products that you used at the time of the infection.
- *Keep makeup containers tightly closed when not in use.*
- *Don't inhale hairsprays or powders.* They can cause lung damage if inhaled regularly.
- *Never use aerosol products while smoking.* They can ignite.

In terms of actual safety surrounding the contents of those products, consumers are left to protect themselves, which in the case of personal care products means reading the label.

## Cracking the Claims Code

Before you can read and understand the labels, you need to know a few things. First, how do we interpret the countless claims made on product labels? Second, what do all those multi-syllabic unrecognizable names and numbers on the ingredient list mean?

Let's start with the claims.

The hot-button word on the lips of every product marketer these days is *natural*. Shampoos and cleansers boast of their “natural cleaning power,” of “using only the most pure and natural ingredients,” ones that “even Mother Nature would approve of.”

Advertisers can use the word *natural* however they want, since its meaning isn't regulated. The *Canadian Oxford Dictionary* defines the word *natural* as meaning “existing in or caused by nature,” but according to *A Consumer's Dictionary of Cosmetic Ingredients*, there are no standards for what *natural* means when it comes to product labelling. For example, the plants used in the product's ingredients can be heavily contaminated with bacteria, pesticides, or chem-

ical fertilizers. The *Consumer's Dictionary* goes on to say, "The use of botanicals and plant extracts is entirely unregulated. Cosmetic ingredients are not registered with the FDA or the USDA so manufacturers themselves can decide to call their product organic or natural without having to meet any certification standards."

*Natural* certainly doesn't mean "organic," though marketers are hoping you'll think it does. In Canada's Agricultural Products Act, under Canadian Food Inspection Agency rules, a product can claim to contain "natural ingredients" if those ingredients have not been submitted "to processes that have significantly altered the original physical, chemical or biological state." In other words, an item may contain natural ingredients, such as cranberries and apples, but these may have been grown organically or conventionally. These natural ingredients may also be present only in trace amounts, tiny portions mixed in with petrochemicals.

The other buzzword whose meaning is being rapidly diluted is the term *organic*—the number of organic claims made on new products grew by 273 percent from 2005 to 2007.

*Organic* means a plant does not contain any genetically modified organisms and has not been treated with any chemical pesticides or synthetic fertilizers. A personal care product cannot be organic, of course, as the word refers to a set of standards for farming. It is the ingredients in the product that may or may not be organic. In most cases it is a question of degree: the label may claim the product is organic, but that depends entirely on how many of the ingredients meet the criteria.

According to the Organic Federation of Canada, natural products are not organic unless both the products from which they are extracted and the processing methods used are certified organic. For personal care products manufactured in the United States, the *organic* label—overseen by the U.S. Department of Agriculture (USDA)—is given only to those products whose ingredients are more

than 95 percent organic. For a product to be labelled as “made with organic,” 70 percent of its ingredients must be certified organic. Very few personal care products meet these requirements. That means that every time you read a label claiming “60 percent organic” or *any other number lower than 95 percent*, the claim has not been certified or overseen by the USDA.

Canada and the United States entered into an agreement in 2009 recognizing our national organic systems to be equivalent, so you can assume that the same regulation applies to Canadian-made products with organic ingredients.

Beginning in June 2011 Whole Foods stores across North America will require third-party certification on personal care products and cosmetics claiming to be organic. Until other retailers follow suit, be your own best judge: look for the USDA organic certification.

No scientific studies are required to substantiate the label claim of *hypoallergenic*, so that often-used term has little real meaning. According to *A Consumer's Dictionary of Cosmetic Ingredients*, “*Hypo* means less than, and *hypoallergenic* means only that the manufacturer feels that the product is less likely than others to cause an allergic reaction. Although some manufacturers do clinical testing, others may simply omit perfumes and other problem-causing ingredients.” Cosmetics manufacturers are not required to substantiate a product's claim of being hypoallergenic. Given that no certification or third-party testing takes place, the word *hypoallergenic* on a label has no value.

For an overview of all the spin we read on labels, visit the website Greener Choices, operated by *Consumer Reports* ([www.greenerchoices.org](http://www.greenerchoices.org)). Go to the Labels and Claims section and search by product type, and you'll see how misrepresentative labelling can be.

*Consumer Reports* asks some critical questions: Are the label standards publicly available? Was the label developed with broad public

and industry input? In almost every case, the answer to these and other important questions is no. In fact, most of the language used on the labels of personal care products has no meaning, with the exception of the leaping bunny, shown below. Products with the leaping bunny logo have been approved under the international Humane Cosmetics Standard (HCS), which is a guarantee that neither the product itself nor any of the ingredients it contains have ever been tested on animals after a fixed cut-off date. The HCS organization, a coalition of animal-protection groups from North America and the European Union, is the world's only international body for cosmetic or toiletry products that have not been tested on animals. Find out more on the website ([www.leapingbunny.org](http://www.leapingbunny.org)). You can also find a list of all approved brands worldwide at [www.gocrueltyfree.org](http://www.gocrueltyfree.org).



## Do Your Research

By now you might be starting to panic about all the chemical hazards lurking in every personal care product in your home. Although this book is a great starting point for dealing with those fears, it doesn't include details on every cosmetic and how safe it may or may not be. But the Cosmetic Safety Database, known by the nickname Skin Deep, can provide that depth of information ([www.cosmeticsdatabase.com](http://www.cosmeticsdatabase.com)).

The website is an extraordinary feat of data collection. Put together by the Environmental Working Group and based on a 2005 report by the same name, the site cross-references 14,000 personal care products in the marketplace with toxicity and safety studies, resulting in a detailed analysis and hazard rating for all products or ingredients. The Skin Deep website does for consumers what manufacturers should have done at the beginning of their process: it checks to see which ingredients are unsafe and why. The site is updated and expanded regularly to include new products and is a valuable resource.

The Campaign for Safe Cosmetics ([www.safecosmetics.org](http://www.safecosmetics.org)) is another excellent online tool that reveals the phthalate content in a huge number of cosmetic and personal care items. And the Canadian Guide to Less Toxic Products site ([www.lesstoxicguide.ca](http://www.lesstoxicguide.ca)) is as indispensable for identifying safe personal care and baby care products as it is for listing natural household cleaning options.

## **GREEN BEAUTY**

For updates on the latest in eco-friendly cosmetics, visit the curated beauty boutique created by makeup artist Donna Bishop ([www.greenbeauty.ca](http://www.greenbeauty.ca)). She's done the legwork to find high-end, professional-quality, eco-friendly products—she won't give you a lot of choices, just her current favourites. The site includes a directory of makeup artists with green kits, which is valuable when you need to have someone else apply your makeup and don't want to spend your wedding day or other special occasions coated in toxins. I don't always agree with Bishop's choices—she prefers Kiss My Face mascara, which contains parabens, for example. But if you want to see what the pros are recommending for eco-forward makeup, check out the site.

You are probably wondering why store shelves are stocked with so many products that score a high hazard rating on a scientific safety analysis like that done by Skin Deep. I hope that by now you are also realizing that the regulation of the personal care product industry is flawed and lacking in many ways.

Many of the unpronounceable ingredients on the back of your shampoo or moisturizer are chemicals that are “generally recognized as safe” (GRAS). GRAS chemicals are classified this way by the U.S. FDA based on the fact that no one has yet proved that they cause harm to human health. In other words, it’s an “innocent until proven guilty” approach to safety—hardly in step with the precautionary principle advocated by many leading environmental scientists. Without testing for a chemical’s long-term effect on human health, or on the environment—and no such testing has taken place on 85 percent of the more than 85,000 chemicals in use in today’s marketplace—there’s no way to know whether it should *not* be generally recognized as safe.

Now you see why we have to be our own advocates.

Efforts are underway to change laws and increase consumer protection. The Campaign for Safe Cosmetics is a coalition of environmental health advocacy groups and non-governmental organizations managed by the U.S.-based Breast Cancer Fund. In 2004, the organization created the Compact for Safe Cosmetics ([www.safecosmetics.org](http://www.safecosmetics.org)), a pledge committing companies to making safer products. Signatories must meet strict criteria, including compliance with the European Union Cosmetics Directive, full disclosure of ingredients, and publicly available data to substantiate safety claims. You can check the campaign’s website to see which companies have signed up.

Safer Chemicals, Healthy Families ([www.saferchemicals.org](http://www.saferchemicals.org)) is a U.S.-based group trying to have federal policies passed to protect consumers from toxic chemicals. In Canada, Environmental Defence scored a significant victory with the bisphenol A (BPA) ban in 2008. BPA is just one of the hazardous chemicals being investigated by

the organization in the wake of its frightening 2006 study *Polluted Children, Toxic Nation*, which found dozens of toxins in the blood of average Canadian families. In a follow-up book, *Slow Death by Rubber Duck*, Environmental Defence investigators Rick Smith and Bruce Lourie tested their own blood and urine on a regular basis to measure the impact of their daily exposure to chemicals. The results were stunning, even for them: “The ubiquity of synthetic chemicals in our daily lives,” they write, “... and their accumulation in our bodies is an unjustifiable imposition by the industries who manufacture the chemicals and by the government regulators who are supposed to keep such things from causing harm.” Unjustifiable, yes, but very real for the moment. While we wait for laws to change, this guide will be your toolkit, your arsenal. When you think of the battle being waged for your cosmetics dollar, remember that marketers will do whatever it takes to win. It’s war out there in the drugstore aisles, and without the proper protection, you don’t stand a chance.

In each chapter of this book you’ll find more detail about which kinds of products contain these chemicals and which don’t. And you’ll find lots of homemade recipes to try—that way you’ll know *exactly* what ingredients you’re dealing with.

In most cosmetic and personal care product labels, ingredient lists must begin with the ingredient present in the largest concentration and move down to the smallest amounts, sometimes just trace elements. Colours and dyes are usually listed last.

However, in the case of a cosmetic that doubles as an over-the-counter drug, such as makeup that contains sun protection factor (SPF) or a shampoo that fights dandruff, the main therapeutic agent is called the *active* ingredient and is listed first, regardless of whether or not it is present in the highest concentration. With this type of product the components that are not the active ingredient are often listed as *inactive* ingredients, which is really a misnomer.

Ingredients that are present in less than a 1 percent concentration may be listed in any order. The problem is that consumers have no way of knowing which ingredients are present in less than a 1 percent concentration because the cut-off point is not shown on the label.

Because of changing guidelines in the European Union, plant ingredients are now listed by using their *Latin name in italics* (followed by their more familiar English name in parentheses). With the tiny type most of us read under fluorescent lights in most stores, that doubling up of names is terribly hard to follow.

Below is a list of the ingredients you should avoid. Many more chemicals need to be on any definitive list, but they aren't because scientists don't know enough about them. No single list is going to keep us completely safe from chemical exposure—it's in the air we breathe, the water we drink. But when you're making shopping choices, this list will arm you with the information we have so far.

## Ingredients to Avoid

**Coal tar** A chemical derivative of coal, coal tar is used in dry skin and anti-redness skin treatments, bath soaks, and anti-lice and anti-dandruff shampoos. It is also used as a colourant in hair dyes. Banned in the European Union since 2004, it is a known carcinogen. It may be listed as coal tar, FD&C, D&C colour plus a number (e.g., FD&C Red No. 6 or D&C Green No. 5).

**DEA/TEA/MEA** (diethanolamine, triethanolamine, monoethanolamine, cocamide DEA) These chemicals are used as emulsifiers and foaming agents in products like shampoos, face and body washes, and makeup. They are suspected carcinogens, are readily absorbed by the skin and other organs, and can combine with nitrates to cause cancer-causing nitrosamines. There is no way to know which products contain nitrosamines, because disclosure of the by-production

of nitrosamines is not required by any governing agency. Watch for ingredient names like DEA, TEA, MEA, cocamide DEA, lauramide DEA, oleamide diethanolamine.

**Ethoxylated surfactants and 1,4-dioxane** Present in many beauty products but never listed on the label because it is a contaminant—or by-product—rather than an ingredient, 1,4-dioxane has been identified by the U.S. Environmental Protection Agency (EPA) as a probable human carcinogen. The contamination results when ethylene oxide (a known breast carcinogen) is added to other chemicals to make them less harsh. For instance, it is added to sodium lauryl sulfate to make sodium laureth sulfate. The chemical 1,4-dioxane readily penetrates the skin and is found in many beauty products, including hair relaxers, shampoos, and children's soaps and body washes—the Environmental Working Group in the United States found 57 percent of baby soaps contaminated with 1,4-dioxane. Ingredients that contain the letters *eth* are red flags for the presence of 1,4-dioxane. Watch for products that list polyethylene, polyethylene glycol, polyoxyethylene, oxynol, cetareth, oleth, -xynol, PEG, or any other *-eths* (such as sodium laureth sulfate).

**Formaldehyde** Classified by the U.S. Environmental Protection Agency as a probable carcinogenic immune system toxicant and a skin irritant, this ingredient is found as either an additive or a contaminant in some nail products, such as hardeners, polishes, and cuticle treatments; hair colouring; false eyelash adhesives; shampoos; and many other beauty products. It has been banned for use in beauty products in the European Union. Some names to look for are formaldehyde, formalin, formic aldehyde, methanal, methyl aldehyde, oxomethane, oxymethylene, DMDM hydantoin, diazolidinyl urea, and imidazolidinyl urea.

**Fragrance/parfum** The Environmental Working Group suggests that the ingredient “fragrance” equals “hidden chemicals.” Considered trade secrets, companies are not required to list the ingredients that make up the scent of their product, but task forces like the Environmental Working Group and Greenpeace have found high levels of phthalates and artificial musks in products they tested, hidden under the term *fragrance*. Fragrances are also linked to headaches, dizziness, asthma, allergies, and effects on the central nervous system. Look for products that are scent-free or that use essential oils for fragrance. Avoid all products with the ingredients fragrance, perfume, parfum.

**Hydroquinone** Used in skin-lightening treatments and creams, and present as a contaminant in some products, hydroquinone decreases the production of melanin in the skin and increases the skin’s sensitivity to harmful UVA and UVB. Banned in the United Kingdom, hydroquinone is rated a ten (most toxic) on the Environmental Working Group’s Skin Deep database and is linked to cancer, immunotoxicity, neurotoxicity, developmental/organ toxicity, and reproductive toxicity.

**Lead** Traces of lead have been found in many lipsticks, but lead is never listed as an ingredient on a lipstick label because it is considered a contaminant. It can also be found in hair dye, sometimes listed as lead acetate. Lead is a proven neurotoxin, a known carcinogen, and a hormone disruptor. Avoid!

**Mercury** A heavy metal, mercury may still be found in some mascaras and other products, like eyedrops, as well as in topical medications and vaccines. It is a known allergen, is linked to neurological impairment, and negatively affects brain development. Look for thimerosal, mercuric oxide, phenyl mercuric acetate, phenyl mercuric benzoate, mercurochrome.

**Mineral oil** This clear, cheap, colourless oil is a by-product of petroleum processing. Mineral oil is the main ingredient in baby oil and is used in a range of moisturizers, lip glosses, lipsticks, foundations, and styling gels, to name a few. It acts as a plastic wrap on the skin, inhibiting the skin's ability to release toxins.

**Oxybenzone** The active ingredient in most chemical sunscreens, oxybenzone filters UV light on the skin's surface, converting it from light to heat; oxybenzone accumulates in the body's fatty tissues and has been implicated in allergies, hormone disruptions, cellular damage, and low birth weight. It is also listed as benzophenone-3, benzoyl-5, 5-methoxyphenol, 2-hydroxy-4-methoxybenzophenone, methanone, solaquin.

**Parabens** A class of chemicals used as preservatives, parabens are found in a range of beauty products, including shampoos, moisturizers, shaving cream, cleansing gels, personal lubricants, topical pharmaceuticals, and toothpaste. Parabens are linked to endocrine disruption, reproductive toxicity, immunotoxicity, neurotoxicity, and skin irritation/dermatitis. They are also linked to breast cancer; several studies have found parabens to mimic estrogen—an effect that is linked to increased risk of breast cancer and reproductive toxicity. Look out for methylparaben, ethylparaben, propylparaben, and butylparaben, as well as 4-hydroxybenzoic acid, propyl ester, propyl 4-hydroxybenzoate, benzoic acid, and 4-hydroxybutyl ester.

**Paraphenylenediamine (PPD)** Toxic to the skin and the immune system, PPD causes allergies and dermatitis. This chemical compound found in hair dyes and some other hair products has been linked to cancer in lab tests. Look for names like paraphenylene, PPD, p-diaminobenzene, p-phenylenediamine, p-aminoaniline, 1,4-benzenediamine.

**Phthalates** Phthalates are found in a wide range of body products (and are also found leaching into the air out of your new shower curtain). According to environmental watchdogs the Environmental Working Group and Greenpeace, phthalates are hidden within fragrances, perfumes, and perfumed products, like deodorants and lotions. Linked to endocrine (hormone) disruption, liver, kidney and lung damage, and cancer, these plasticizers are banned in California and the European Union for use in children's toys. Avoid products with the ingredients fragrance, perfume, parfum.

**Placental extract** Placenta is used in some skin and hair care products. It is linked to endocrine disruption. Look for placenta, placental protein, hydrolyzed placental protein.

**Polyethylene glycol (PEG)** A penetration enhancer found in many cosmetic and body care products, polyethylene glycol is easily absorbed into the skin and may be contaminated with 1,4-dioxane and ethylene oxide, both known carcinogens. Look for polyethylene glycol (PEG) and for related synthetics PG (propylene glycol) and PPG (polypropylene glycol).

**Silicone-derived emollients** Added to products to give the hair or skin the appearance and feel of smoothness, silicone-derived emollients are an environmental concern as they do not biodegrade, and they inhibit the skin from breathing, thus contributing to skin irritation and acne. They are also linked to tumours in laboratory testing and are said to accumulate in the liver and lymph nodes. Look for names like cyclomethicone, dimethicone, and dimethicone copolyol.

**Sodium lauryl (ether) sulfate (SLS, SLES)** A chemical additive that makes a product soapy, SLS began as an industrial degreaser and garage floor cleaner. It is easily absorbed by the body and is a known skin irritant. You will find it in body wash, foaming facewash, soap,

bubble bath, shampoo, even toothpaste. Watch for sodium lauryl (or laureth) sulfate (SLS, SLES), sodium dodecyl sulfate, PEG (1, 4) lauryl ether sulfate, sodium salt, sulfuric acid, monododecyl ester, sodium PEG lauryl ether sulfate, and sodium dodecyl sulfate.

**Talc** Talc is still found in some baby powders and as a moisture-absorbing ingredient in products like eyeshadow, blush, and deodorant. Talc is similar to asbestos in its chemical composition. It is linked to ovarian cancer and is also a probable respiratory toxin. Watch for ingredients listed as talc, French talc, or cosmetic talc.

**Toluene** A possible endocrine disruptor and developmental toxin, and a known immune system toxicant, toluene is used in nail products and hair dyes. It may be hidden in fragrance. Look for toluene-2,5-diamine, toluene-2,5-diamine sulfate, methylbenzene, toluol, benzene. Also avoid butylated hydroxytoluene, an antioxidant that accumulates in the body and is known to cause skin and eye irritation.

**Triclosan** Found in many beauty products, including antibacterial products, soap, hand sanitizers, face cleansers, and deodorants, triclosan has been linked to cancer and endocrine disruption in some laboratory studies. It is also harmful to the environment. It is under review by the U.S. FDA, and Health Canada advises consumers to avoid antibacterial products. Currently 1200 cosmetics registered by Health Canada contain triclosan. Look for triclosan or the brand name Microban.

## The Scare

Throughout the book, I have included particularly alarming evidence that I call The Scare, a simple way to highlight the most frightening aspects of the products or chemicals in question.

Although many of the statistics in this book refer to “the average woman,” the concerns that those numbers illustrate apply to everyone. The lack of regulation and testing is true for all personal care products, for men, women, and children. Some of the language in the research refers to cosmetics, but we are also talking about everyday basics, like shampoo and deodorant. The concerns are relevant to anyone who has taken a bubble bath, shaved with shaving foam, or put moisturizer on dry skin.

Whether we like to admit it or not, many of the comforts we enjoy every day are made possible by chemicals. But what we are talking about in this book are the unintended consequences of the chemical revolution. It made our hair easier to brush, our counters easier to wipe, our bathtubs easier to clean, our makeup stay on longer. But it has also led to some staggering health problems. Here are a few:

- Sperm counts worldwide have dropped by 50 percent over the past forty years.
- The surfactants used in shampoos and lotions end up in the soil, significantly changing the way plants grow. Hormone-disrupting chemicals in personal care products have devastating effects on wildlife as well: research papers from several conservation organizations, including World Wildlife Fund, report finding human-made chemicals accumulating in fish and other species in the wild.
- Formaldehyde is classified by the U.S. Environmental Protection Agency *and* the International Agency for Research on Cancer as a carcinogen. It is banned in Canada, Japan, and the European Union but is deemed safe for use in cosmetics in the United States.
- Phthalates have been linked to reproductive birth defects, affecting babies in utero and causing undescended testicles, hypospadias (an abnormally placed urinary opening on the penis), low sperm count, and hormonal imbalance; about a billion tons of phthalates are produced and sold worldwide every year, according to the Campaign for Safe Cosmetics.

- A 2004 study found parabens in the tumours of nineteen out of twenty women with breast cancer.
- The European Commission on Endocrine Disruption has listed parabens as Category 1 priority substances, based on evidence that they interfere with hormone function. It has been estimated that women are exposed to 50 milligrams of parabens per day from cosmetics. The use of parabens in cosmetics in Canada or the United States has no restrictions.
- The word *fragrance* on a package label is a hiding place for toxic chemicals, sometimes in an otherwise safe-seeming product. Under USDA regulations, manufacturers are not required to disclose the chemical formula used to create a synthetic fragrance.
- A 2007 Harvard study correlates damage to male sperm, which can lead to infertility or miscarriage, with diethyl phthalate (DEP), the phthalate used most widely in cosmetics.
- A 2009 study reports endocrine disruption in females of widely varying ages from the use of personal care products: premature breast development and menstruation in a thirty-six-month-old girl following exposure to hair lotion containing oestrogenic products used by her mother; abnormal genital bleeding and breast cancer in a ninety-three-year-old woman after long-term use of a body care cream containing ethinyloestradiol.
- The 2002 report *Not Too Pretty: Phthalates, Beauty Products, and the FDA* tested seventy-two name-brand beauty products for phthalates. An independent lab found the chemicals, which have been linked to reproductive harm, birth defects, and cancer, in almost three-quarters of the products tested, even though they weren't listed on the labels.
- In June 2008, California's attorney general filed a lawsuit against Avalon Natural Products (makers of Avalon and Alba brands), Whole Foods Market California (makers of Whole Foods 365 brand), and two other manufacturers of "natural" shampoos and

conditioning products. All their products were found to contain high levels of 1,4-dioxane, classified by the U.S. Environmental Protection Agency as a probable human carcinogen. The chemical 1,4-dioxane is not actively added during manufacturing but rather is something that forms during a process called ethoxylation, a shortcut that makes harsh ingredients milder. The 1,4-dioxane is a by-product of another chemical called ethylene oxide, which means that 1,4-dioxane never shows up on ingredient lists.

- Without blood or hair analysis to determine the levels of heavy metals and chemical contaminants, many symptoms of chemical exposure are mistaken for other diagnoses. Headaches, nausea, dizziness, joint inflammation, eczema, shortness of breath, rashes, and acne—all are possible side effects from the chemical body burden.
- This issue is not just about human health; it is also about the trickle-down effect. What we put on and in our bodies ends up in the water table. Most of the water systems tested by the U.S. EPA contained chemical contamination. Packaging and waste from countless bottles of products, nearly all of which are made from petroleum, remain for hundreds of years in landfill sites, long after we (and our perfect silky hair) are gone.

Dr. Devra Davis is director of the University of Pittsburgh Cancer Institute Center for Environmental Oncology in Pennsylvania. Having spent decades researching the effects of environmental toxins on human health, she is one of several experts interviewed in the powerful 2008 documentary *The Disappearing Male*. “How much proof do we need?” she asks. “If we insist that the only proof we’ll accept is dead bodies and sick people, then we are dooming our kids to getting sick before we can take action to protect them.”

We don’t have to wait to protect our children and ourselves. Read on.