Skin: A Natural History

Nina G. Jablonski
Los Angeles: University of California Press, 2006, 266 pp., (hardback), $24.95.
ISBN-10: 0520242815; ISBN-13: 978-0520242814

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It is hard not to judge *Skin: A Natural History* by its cover. At first glance, the photograph is of a grey, wrinkled elephant's trunk. But with closer inspection it morphs into an aged woman's arm, boasting topography that rivals the Appalachians, leading one to ponder the dermal parallels between these two long-living circus animals, and also to curiously lament the inevitable wrinkled fate of our own bodies.

With an anthropologist for an author, one naturally expects *Skin* to be focused mainly on the outer covering of humans. But the illusion on the book's own skin hints at a scope beyond one area of Jablonski's scholarly expertise—that of human skin and skin color. Thus, one wonders if a superficial impression of *Skin* misrepresents the contents of the book, paralleling the way our emotionally responsive skin tends to betray our calculated intentions (a theme that Jablonski skillfully plays on throughout the text).

The real meat of *Skin* is comprised of the effects of the sun on skin and on potentially multiple occurrences of pigment evolution in hominins, as well as the hominin loss of body fur and increase in sweating. The book also covers basic anatomy and function, evolutionary history, touch and sensation, emotion and stress responses, aging, trauma, disease, medical treatments and technologies, cultural modification and ornamentation, and high-tech skin-related advances. Phenomena like fingerprints, tanning, sunburning, freckles, moles, wrinkles, blushing, flushing, and stress sweating are explained. Apparently hand and foot dampness during the "fight or flight" reaction is an adaptation that enhances grip for a swift escape. Unfortunately such a finely-tuned fleeing response is not compatible with standards of human behavior during job interviews.

Because of the scarcity of fossilized skin and skin impressions in the fossil record, paleontology is justifiably thrown out the window in favor of comparative anatomy's evidence for skin evolution. All of the types of skin and its appendages (hair, feathers, claws, nails) in all the major animal groups are reviewed. The sweating of humans in comparison to other primates and other animals is discussed and the difference in types of sweat, sweat glands, and their distribution is explained. Of worthy consideration is the impact of the loss of body fur in humans on signaling, which led to our increased reliance on facial expressions to transmit information.

Jablonski offers a cogent theory of the period of human evolution that begins with early *Homo*. She argues that the need for thermoregulation while walking around with a hot brain in the sunny hot periods of the day (presumably while foraging, hunting, and scavenging) led to the selection for body fur loss. This was accompanied by the evolution of more eccrine sweat glands and greater melanin production for darker skin. The combination of body fur loss, increased heat tolerance through sweating, and darker skin enabled hominins to travel further and spend longer periods of time under the hot sun, and also facilitated brain enlargement.

Skin walks us through the story of the evolution of human skin color with selective pressure favoring dark skin in the tropics (protects from intense and damaging UV radiation) and light skin at high latitudes (allows enough of the less intense UV rays to penetrate the skin for Vitamin D production). These arguments are powerfully enhanced by maps that beautifully illustrate the predicted (which may as well be observed) geographic distribution of skin tone based on UV radiation intensity and distribution (Maps 1 and 2).

Jablonski's friendly story-telling tone is personal, casual, clever, and dappled with wit and enthusiasm, without being cute or condescending. I was delighted to learn that the mammary glands evolved from the same types of follicles as hairs and feathers. That means that, in a way, Linnaeus's runner-up name for mammals, "Pilosa" for hairy things, would have meant essentially the same thing.

There are a few wrinkles in *Skin*. Jablonski's opinions on hominin taxonomy and phylogeny are not as mainstream as they claim to be (p. 197 of the Notes). Although she discusses genetics involved in skin pigmentation, Jablonski never ponders the genetic mechanisms that could have caused body fur loss. Should we be combing through the naked mole rat genome for candidate genes? What about hairless Chinese crested dogs or sphinx cats? Could we determine, genetically, if body fur loss occurred gradually or suddenly? Could we also track, genetically, the evolution of head and eyebrow hair, and also underarm, face, and pubic hair which presumably occurred after body hair was effectively lost?

Although warranted, some of Jablonski's arguments against aquatic ape theory are odd (p. 40). If per chance ancient hominins were adept swimmers, surely their "long gangly arms" would have been useful, not harmful. Just because aquatic ape theory is (thankfully) dead we should not overlook the possibility that ancient hominins dipped, waded, and wallowed to stay cool like we and many other mammals do. Furthermore, if the Eskimo-Aleut people

have more skin pigment for fighting the reflected rays from water, snow, and ice (p. 92), why not hydrophilic African hominins too?

Skin opens up a whole new set of questions. Aside from sunshine issues, how vulnerable, compared to other mammals, is the naked human skin to cold temperatures, punctures, tears, rashes, fungi, etc.? How would these vulnerabilities have affected human behavioral evolution? How do the skin and the brain differentiate between cold and wet sensations? We learn that bald-faced primates get darker with age, but do they ever get skin cancer? Most of the sexual roles of skin are left to the rich imaginations of those readers who "can boast some expertise, gained from personal experience" (p. 120).

How much of the signal from the cover is true to the content? That is, is *Skin* really a natural history or is it a book about human skin and skin color? The answer is: who cares? *Skin* is a page-turner. Popular science books are rarely ever hair-raising (see "piloerection," p. 19), but Jablonski still manages to seduce the reader for long bouts of enthralling, effortless reading—a major feat for this genre. Jablonski lays down just enough foundation and background to provoke interest and stimulate the reader to formulate questions. Then throughout the rest of the book she reinforces those fundamentals during her deeper discussions of particular topics and she deftly anticipates the questions the reader probably formed at the introduction. None of this achievement is shocking considering Jablonski's scholarly reputation (e.g., Jablonski 2004). But, impressively, *Skin* is just as delicious and digestible for non-specialists, non-academics, and even those whose only familiarity with "Nina Jablonski" is with the character named after her in *Still Life with Woodpecker* (Robbins 1980).

Skin imparts essential lessons without preaching. For instance, it is primate nature to judge others by their covers. But with globalization-induced population diversity and with a life-expectancy that is twice as long as it should be, it is our standards of judgment that need major makeovers, not our covers. Wrinkles bare diminished fertility, but they also bear wisdom. Just like bony enthesopathies, epidermal scars and spidery varicose veins are trophies of hard work, conquered trauma, and adventure. Those of us without tattoos, scarification, cosmetics, and piercings are actually the weird ones. It is time we get comfortable in our skin, embrace its usefulness as a message board, and also protect it and feed it better during our unnaturally long lifetimes and our unnaturally far travels.

Why should paleoanthropologists read about anatomy that rarely fossilizes, especially if their job entails digging through museum drawers, finding teeth which were incorrectly assumed to belong to monkeys, and identifying them as the first known fossils of chimpanzees (McBrearty & Jablonski 2005)? Obviously because it is the whole organism we are interested in, not just the skeletal remains we are fortunate to find eons later. What's more, human skin color diversity and our penchant for skin graffiti and manipulation sit prominently on the list of uniquely human traits and behaviors. Plus, we are most of all interested in one particular organism, ourselves, and any knowledge is worth having when it helps prevent us from aging into walking and talking Ötzis (the mummified glacier man from the Ötztal Alps between Austria and Italy).

Ultimately, as anthropologists it is our responsibility to teach the knowledge that leads to tolerance of other human beings. *Skin*'s most important message is the one that Jablonski shrewdly chose not to press on us: The best way to beat prejudice is not to dismiss skin as "just skin" or to brag that one is "color blind." Instead, the most effective way to defeat skin color bias is to foster an appreciation of skin function and the wonderfully adaptive roots of its variation. Prejudice cannot be eradicated by mere tolerance. It is only a deep understanding, like that provided by *Skin*, which can eventually lead to the demise of racism. Professors, politicians, celebrities and other public figures that read *Skin* can promote its simple truths. (They should also avoid botox facial treatments if they aim to evoke emotion and inspire action (p. 161).) Perhaps the next version of the human skin story should be told in a Gore-esque documentary entitled *The Convenient Truth (of Skin Color).*

REFERENCES

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