

# Skin Color

Intro: Hi, I'm Jim. I'm Erik. And I'm Jo, and this is Speaking of Race.

Jo: You know, it's funny that we've been talking about the science of race now for years and the thing that most people think about when they hear the word "race" is skin color, yet we've never really given it a proper "speaking of race" treatment.

Erik: Let's do it!

Jim: It's going to take at least this episode and the next to unravel the history and science of human pigmentation.

Erik: So where do we start? Let me guess – you anthropologists are going to make us go back to when our ancestors shed their furry coats and their skin became exposed for all the other critters to see?

## Noticing differences

Jim: Maybe. But for today's episode, let's ease you historical types into it. We're going to look at the history of how people have understood and assigned meaning to differences in skin color. We'll start with some of the early evidence we have of notice being taken of the differences...And then we'll talk about how the anatomy and physiology of skin color was discovered, and finally look at some of the pre-modern and modern explanations for the geographic distribution of skin color. We'll get into genetics next time.

Jo: Oh is that all? Great! I hope people have a long car trip planned or something.

Jim: Our earliest historical evidence of people just even NOTICING skin color differences comes, not surprisingly, from art and literature in the areas of the oldest civilizations: Egypt, India, and Greece.

Jim: We can't say much about what Egyptians thought CAUSED skin color because we just don't have an historical record to go on. But we can say something about how they depicted it. Archaeological evidence from inside Egyptian tombs represents different human skin colors all the way back to the Early Dynastic period, almost 5,000 years ago. But the most famous (or infamous) representation of human race in the ancient world comes from the so-called "Book of Gates" or "Book of Pylons" panel inside the 3,000 year old New Kingdom tomb of Seti I first seen by Europeans in the early 1800s.

Jo: Right, we talked about this a few years ago on this podcast. If I remember, the nineteenth century Europeans tried to make more of the skin color issue than was really there, right?

Erik: It seems so. From Heinrich Menu von Minutoli in the 1810s through our own Josiah Clark Nott in the 1850s, Europeans took these ritual renderings from the inside of pyramids of four differently dressed and colored groups of people and turned it into canonical four races of humans.

Jo: Was it a problem that it was only four, since Blumenbach and other Germans had recently said it was five races of humankind?

Erik: Weirdly, that discrepancy actually helped their explanations since they said the ancients wouldn't have known about the fifth "race"-- all the aboriginal Americans. The problem is, when actually translated from hieroglyphics, the four groups come out as Libyan ("Themehu"), Nubian ("Nehesu"), Asiatic ("Aamu"), and Egyptian ("Reth"). We have no idea whether this is supposed to be some sort of racial grouping.

Jo: And there was a lot of variability from one place to another with how the skin colors of different groups was represented even just in ancient Egypt, yes?

Jim: Yes there was. For instance, if you look at depictions of just the "boy king" Tutankhamun, different artists portrayed him having black, brown, or reddish skin. So, same guy, different colors.

Jo: Ok, so they were maybe aware of differences in skin tone, but not consistent in what the differences were, how to apply them, or why it mattered....

Erik: In my understanding that's about right. I mean, there were insiders, and then everyone else was an outsider, regardless of their skin color. Differences were usually based on things like religion, language, or what we might call ethnicity. Not skin color.

Jim: Yes, and a lot of that sentiment was present also in ancient Greece, overlapping some with Egyptian dynasties. Greece is especially salient for skin color and race because European Enlightenment scholars looked to it for a "perfect" society, and philosophers and naturalists were inspired by Greek and Roman scholars. For example, the term "Ethiopian," which was widely adopted by race scientists like Blumenbach, came from the Greeks. It's used by Homer, in both *The Iliad* and *The Odyssey*, where he calls folks "Ethiopians." He doesn't say anything about their skin color, but it translates roughly as "burnt face" and it's been commonly assumed that this refers to dark skinned folks from Africa.<sup>1</sup>

Erik: Interestingly, there was no continent of Africa for the ancient Greeks. The Greek territory of "Africa" was confined to only a small sliver of what we might call Morocco, Algeria, Tunisia, and Libya. South of this was called "Libya" According to the the African American classicist, Frank Snowden around World War 2, the "Ethiopian" type south of the Nile River Valley were (quote): "Flat noses, woolly hair, integument rich in pigment, these were to Greek the outstanding physical features of this type [Ethiopian]. Of these features, it is apparent that the color of the skin was uppermost in the mind of the Greek. By far the most common words which the Greeks used in these passages to designate the color of the Ethiopian's skin [was (black)]" (Snowden, 1948, pp. 32-33).

Jo: Ok, ok, so I can see that this term "Ethiopian" is coming to be associated not with nationality per se, but with dark skin color in the Ancient Greek sources. So what?

Jim: I think the point here is that it was these early encounters between different groups that set the stage for later racializing of skin color. We'll get to that later on. For now, though, we should note that the ancient Greeks and Romans provide a very early explanation of why different skin colors exist.

Erik: I know this one. The Roman poet, Ovid, re-interpreted the Greek myth of Phaethon losing control of the sun god's chariot as an explanation for both the skin color and the geography of Sub-Saharan Africa. He said that when Phaethon lost control of the chariot, it got too close to the earth and caused the blood to rush to the surface of the skin of the Ethiopians, turning it black. At the same time, the scorching burned off the vegetation and turned much of Africa to desert.

Jo: Medical anthropologist Jo also remembers that the Greek physician Hippocrates had something to say about skin color. He was the one who defined the four humors: blood, phlegm, yellow bile, and black bile and explained illnesses as the imbalance of humors.

Erik: Well, Hippocrates himself didn't tie these humors to skin color, but you're right, Jo, over time, his theory led others to surmise that an excess of one of the bile substances could explain non-white skin colors. Like, in the 9<sup>th</sup> century, the Persian Muslim scholar, Al-Tabari, pushes a humoral explanation of skin color, saying: "The colorings of the body correspond with which gained the ascendancy over the body and which of the four humours went to the surface in the development of the fetus. When in anyone the light bile predominates, he becomes light skinned; when dark bile predominates, he becomes dark-skinned."

Jim: A totally different explanation circulating roughly around this period of history is the curse that Noah put on Ham's son Canaan in chapter 9 of Genesis in the bible. That's been used to explain why Africans are dark-skinned.

Erik: Weirdly the actual text of Genesis 9 says nothing at all about skin color. The most ancient Hebrew interpretations suggest this has to do with circumcision.

Jim: The fact that the actual text of this section has no mention of skin color hasn't slowed people down from attaching the curse to Africans and tying it to both dark skin and servitude. A Spanish translation of an 8<sup>th</sup> century Midrashic source<sup>2</sup> brings skin color into the discussion with these descriptions of Noah's sons: "Shem, 'dark but comely,' Ham, 'dark like the raven,' and Japhet, 'entirely white'" (Braude, 1997, p. 112, footnote 18).

Jo: But I'm noticing that none of these early explanations were actually proposing mechanisms for skin pigmentation--I mean, the humors explanation might be as close as we get? But there seems to be no real discussion of what's happening within the skin, even if some of these guys are speculating about the internal mechanisms that might lead to different skin colors.

Jim: That's right. It's not really till the Enlightenment that we see physiological explanations being proposed for what produces the different skin tones. Let me just say, I would encourage everyone to go back and listen to our fifty-part series on race in the Enlightenment.

Jo/Erik: Hahaha, 50 part.

## Skin color tied to race

Jim: But seriously, the Enlightenment is when we see skin color become inextricably tied to the newly blossoming concept of race.

Erik: And that's really important if we're thinking about the sort of long-range view of how skin color came to be such an important part of how we assign race today. The focus on skin color slowly grew as chattel slavery using Black bodies became an ever more important part of the

European economic system. As I think I've mentioned before on our podcast, as Protestantism and human slavery spread hand-in-glove. Racial superiority and inferiority based on superficial traits like skin color were used as post-hoc justifications for how Protestants and secular Enlightenment figures who preached "all men are created equal" could also build an entire multi-national economic system around the dehumanizing torture system needed to keep slave-economics going.

Jim: In the first publication to use race in a near modern sense, Bernier in 1684, describes only two colors as he considers Asians, Americans, and Europeans to all have "white" skin that has been affected by different climates while Africans have black.<sup>3</sup>

Jo: It's interesting that he's focused on just white or black categories. Not all that different from the US binary racial system still mostly at work today.

Jim: Except a lot of the people he classed as white aren't accepted by modern white supremacists.

Jo: Fair, fair. But this does make me think about the origins of the cultural value on white-the-color as a sign of purity, goodness, and black-the-color as indicative of evil or dirt, which is of course the key framework underlying anti-black racism, really all over the world. Just a few years ago, I read this really interesting art history article by Anne Lafont looking at how Enlightenment artwork contributed to the racialization of skin color. She starts off with the famous art theorist Claude-Henri Watelet, whom you might or might not have heard of. He's the guy who declared that the color white, being representative of light, reflecting the full spectrum of light according to Newton's theory, was sort of the color of the Enlightenment, of the righteous struggle to attain human perfection.

Erik: Oh ya, uh huh blah blah

Jo: She then goes on to discuss a portrait of the Duchess of Portsmouth aside a young black page, and how that depiction so clearly illustrates the colonial hierarchy of light-skinned master and dark-skinned slave (Lafont, 2017). She takes her analysis right up through interpretations by Thomas Jefferson to indicate how Enlightenment art was used to reinforce the ties between skin color, race, beauty, and hierarchy.

Jim: All of which is just to say that it's during this period that we start to see real evidence of hierarchy developing, where whiter skin is good-er and blacker skin is bad-er. In other words—the historical origins of modern racism.

Jo: right, ya, super important. And it's important to point out that even after SLAVERY ends, there's no change at all to the racial HIERARCHY based on skin color and skull shape. Politicians seem to be okay with the old canard that "slavery is America's original sin," because it helps with the argument that once slavery was ended, the responsibility of white folks to making the world more just and equitable was somehow over. But the hierarchies based on skin color emerged from abolition in the eighteenth and nineteenth centuries completely intact.

Erik: Absolutely! And supported by a full scientific apparatus built around racial typologies that involve more than black and white. In 1735, Carl Linnaeus, in his attempt to classify all plants, animals, and minerals, *Systema Naturae*, cements the association between 4 continental groups and skin colors.

Jim: It's possibly because of Linnaeus, who we still learn about in middle school, that we have the four part division of red Americans, White Europeans, Black Africans, and Brown Asians to tie race (although he used the term for variety, not race) to skin color forevermore. By 1758, in the tenth edition of *Systema*, he changed his mind about the skin color of Asians, adopting a Latin term for yellow, which stays with that race right through the 20<sup>th</sup> century.

Jo: As usual on this podcast, we've got Linnaeus to blame for much bullshittery. But not everyone used that "one race one color" model.

Jim: That's right. In 1775, the Scottish surgeon, John Hunter—whom we've also talked about before on the podcast, in our Enlightenment maxi-series (episode 3 OF 50!)—came up with seven color divisions of humans, but unlike Linnaeus' simple one continent, one skin color, one race model, Hunter didn't link them one per race or region.<sup>4</sup>

## Anatomy of pigmentation

Jo: So it seems like there is some breaking away from the simplistic Linnaeus model there. But a whole *century before* Linnaeus, the people who were first using microscopes were already seeing that the picture was more complicated than humors. Erik, you're a history of science guy. You ever heard of Marcello Malpighi?

Erik: Sure, he was a microscope guy at about the same time as Antoine von Leeuwenhoek and Robert Hooke and Isaac Newton in the 1600s.

Jo: Very good. You can keep your job. Okay, now an anatomy lesson. Malpighi has many anatomical features named after him, including the bottom two layers of the skin. The *stratum basale*, the bottom layer, contains the melanocytes, the cells that actually generate the melanin pigments that produce skin color. Combined with the next outer layer, the *stratum spinosum*, these form the Malpighian layer of the skin. This naming honor is because of his microscopic anatomy work published in 1665, where he describes the "mucous sheath" (the Malpighian layer) under the skin. He noted that the outer layer of the skin was colorless in both blacks and whites and suggested that there must be a substance localized in the bottom skin layers that provided the color differences. He called this substance a "mucous liquor" (Malpighi, 1665).

Erik: I think I drank some of that last night!

Jim/Jo: EWWWWWWW

Jim: The next century was spent searching for Malpighi's substance, until a French surgeon, Claude-Nicolas Le Cat, studying frog nerve cells found a pigment he called "ethiops" (which we now call melanin). The discovery of this pigment led him to assume that it must be what causes skin color in humans. In his 1765 "Treatise on the color of human skin in general, on that of negroes in particular, and on the metamorphosis of one of these colors into the other, either from birth or accidentally" (try saying that three times fast!) he argued that his discovery disproved the explanation of bile as a source of skin color. He also believed there was an association between the pigment and the environment, noting that blacks had a greater amount of the pigment than whites.

Erik: About the same time, the Dutch anatomist Bernhard Siegfried Albinus was still asserting that black bile was the source of dark skin color (Albinus, 1754-1768). But as I mentioned a bit ago, Blumenbach, whose race categories would shape much of 19<sup>th</sup> and 20<sup>th</sup> century race



science, still favored a complicated explanation based on the bile substances, which he thought interacted with carbon and an environmental effect on liver function to produce skin tones (Blumenbach, 1795).

Jim: But then this humoral explanation eventually falls away. About a century after Cat first described this “ethiops” pigment, the English physician and anthropologist James Hunt picks up again on the Malpighian layer idea, nothing that that layer is no different in blacks than whites. Importantly, though, he goes on that the pigment occurs in granules that are widely distributed in the upper part of the Malpighian layer.<sup>5</sup>

Jo: That last part is actually a pretty accurate assessment of how skin gets its colors. Our terminology is a little different today, and we focus a great deal on the cells that produce the granules, the melanocytes that reside in the bottom layer or *stratum basale* of the skin.

Jim: Yep, the anatomy was pretty well nailed down by the 1860s.

Jo: --which again underscores the degree to which value placed on lighter skin than on darker skin could persist unchanged well after formal slavery ended.

Erik/Jim: Yep

Jo: OK, so you both know that I’ve spent some time thinking about how British colonialists in India were trying to figure out how to fit Indian castes into the sort of global story of race and its distribution around the world. This was a HUGE preoccupation for them. We haven’t talked yet at all about this, big question, though—what were people saying not just about the anatomy of skin color, but also about how it was distributed around the world?

## Explanations of the distribution of skin color

Jim: We’ve already alluded to this a little bit with the Phaethon story, which was one of the earliest explanations of how the skin color of “Ethiopians” came to be darker than the skin colors of people in other places.

Erik: True, and this mythological explanation had to be dealt with before others could be brought forth. For moving that along, we can thank the English polymath Thomas Browne, who in his 1646 work argued against the Greek explanation of Phaethon dragging the sun too close to Ethiopia as a cause of dark skin color. His explanation was that skin color gets transmitted from generation to generation, regardless of the sun. So he thought it was inheritance that caused skin color, though of course there weren’t the genetic mechanisms in place to explain how that worked at the time (Browne, 1646, Chapter 10 of Book 6, “Of the blacknesse of Negroes”).<sup>6</sup>

Jo: OK, ya, and of course inheritance is in fact part of how we get our skin colors.

Jim: It is. But Browne actually went a bit too far in the other direction. He basically said that the sun played NO role in skin color—something we now know NOT to be true, when we look at how skin colors have evolved over time—but actually, he was far closer to the truth than some of his contemporaries who were still pursuing the biblical explanation around that Noah-and-his-sons story we mentioned earlier. (Haynes, 2002; Sparks, 1989). That one persisted through much of the 19<sup>th</sup> century.

Jo: After Browne, the British physician John Mitchell also helped push aside mythical explanations of skin color to make way for other kinds of causality. He offered an explanation in his 1744 report to the Royal Society on causes skin color in different climates. He debunked a number of mythical explanations and set the stage for more modern interpretations to come by arguing for aspects of the natural and cultural environment as the shapers of skin color: the power of the sun's heat, nature of the soil, and ways of life, for example (Mitchell, 1744).<sup>7</sup>

Erik: And then there's the French naturalist George Louis LeClerc (better known as Buffon), who's made an appearance on the podcast before. In his *Histoire Naturelle*, he says the different skin colors come from adapting to different environments<sup>8</sup>—although it gets a little funky when he tries to explain how that works. Buffon notes that skin color is the most noticeable difference between groups.<sup>9</sup> He points at heat as being the primary cause of skin color differences, saying that extreme heat causes dark skin but temperate climates cause white skin and extreme cold causes darkness also, going from Africans to Europeans to Lapps.<sup>10</sup> Of course we have to remember that Buffon was deriving all humans from white origins near the Caspian Sea and was of the opinion that the human form was “in its greatest perfection” between 40 and 50 degrees latitude (or Madrid to Brussels)—cutting off the northern boundary short of the homeland of his rival, Linnaeus.<sup>11</sup>

Jo: John Hunter also thought his seven color categories were related to the environment, saying that the sun and air acted as an irritant to the skin, causing pigment to pile up deep in the skin of people living in hotter places—not the same as a suntan, but more permanent (Hunter, 1865 [1775]).<sup>12</sup>

Erik: So really, this group of guys is considering some combination of heat, soil, air, climate, lifestyle. ...No one's entirely sure what's going on here—but they seem to converge around this idea that environment, in broad strokes, is causing the wide range of skin color we see around the world.

Jo: And then there's good ol' Immanuel Kant. I Kant get over him. Remember all the Kant jokes we made in that Enlightenment episode where we talked about him?

Jim/Erik: groan

Erik: Anyway you're right Jo, he had some interesting ideas about what caused dark skin color in Africans, especially in the sense that he proposed a clear mechanism (which turned out to be wrong, but anyway he proposed it) that sort of brought together the “internal” anatomical explanations and the “external” or “environmental” explanations that had been at play around this time. [More on internal (e.g., curse) vs. external (e.g., environment, food) causes] Kant thought phlogiston, the substance supposedly released in combustion, made blood black, and that the skin of Africans must be especially good at removing phlogiston from the blood, accounting for both the darkness of the skin and the ostensible smell of black people. He thought black people needed this process because they “live in regions in which the air is so phlogistized in consequence of thick woods and areas overgrown with swamps” so their bodies must work harder to remove the substance from their blood (Kant, 2007).<sup>13</sup>

Jim: And then there was Kant's contemporary Samuel Stanhope Smith. Almost a decade before becoming president of the College of New Jersey (now Princeton University), he also argued for environmental causes of skin color with the sun, heat, bile, and stagnant water prominently featured (Smith, 1787). His work was influential throughout the 19<sup>th</sup> century. Along with Kant, he helped bring the environmental explanation for skin color into the mainstream.

Jo: But not everyone was on board with this. Way back in our first episode on race and health, we talked about the American physician Benjamin Rush who claimed that “the leprosy” was the cause of black skin color. Remember him, guys? He thought if leprosy was cured or partially cured, light skin will begin to predominate on the body (Rush, 1799). So he wasn’t looking to environment, but rather to disease as the ostensible cause of skin color differences. So it wasn’t like Smith and Kant’s work totally eliminated other ideas about how skin color worked. It was still a muddle of environmental speculation, disease mechanism speculation.....

Erik: And I know I’m always harping on him, but I think we also need to mention Josiah Clark Nott here again. Just as a reminder, he’s the super polygenist guy who coauthored *Types of Mankind* in the mid-19<sup>th</sup> century and who has a building named after him at the UA campus. One of the most significant defenders of polygenism and slavery, and he argued against almost all biblical explanations of early human history. As part of that, he debunked the Noachian curse as a cause of black skin color, in spite of the fact that it was widely being used in the south during the 19<sup>th</sup> century as an excuse for race-based slavery (Nott & Gliddon, 1854, p. 496). He also ridiculed the idea that degrees of latitude and therefore the temperature was causing different adaptive colorations.<sup>14</sup> Nott’s explanation of the distribution of skin colors was that each race had been created as a separate species with the color best-suited to its native environment.<sup>15</sup>

Jim: And then we finally get up to Charles Darwin, who in his 1871 work, *The descent of man, and selection in relation to sex*, entertains the arguments of many prior authors about natural selection accounting for skin color and he finds ways to dismiss all of them.

Jo: You mean Darwin, the guy who came up with natural selection, didn’t think natural selection created skin color differences?! That makes no sense to me. Why not?

Jim: Yep, contrary to what you might think, that’s right. He thought skin color couldn’t be the result of natural selection “because the distribution of the variously coloured races, most of whom have long inhabited their present homes, does not coincide with corresponding differences of climate,” (Darwin, 1871, p. 209).<sup>16</sup> Instead, he says that differences in skin color must be the result of sexual selection (Darwin, 1871, pp. 207-215).<sup>17</sup> And to this day, there are still scholars who adhere to the sexual selection explanation! (Aoki, 2002).

Erik: I think it’s important to tack on here that, as much as I like the guy, Darwin didn’t solve any problems in the skin color debate. You still had people advocating the notion that color came from internal factors, others that believed it was the sun or other external factors, and some that believed Darwin’s psychological explanation—that female choice over uncountable generations created differences in skin color.<sup>18</sup>

## 20<sup>th</sup> Century explanations of distribution

Jo: Alright. So this brings us up to the 20<sup>th</sup> century. We’ve just slogged through a few millennia of knowledge or at least speculation about skin color, how it works, and why it looks different around the world. I’m not sure I see any kind of consensus emerging here, though. Where does this leave us?

Jim: In the dark?

Jo: ummmm....



Jim: But seriously, as more naturalistic science-based explanations for skin color were sought in the early 20<sup>th</sup> century, researchers started focusing on the emerging link between sunlight and Vitamin D to construct their just-so stories. This link was verified by experimentally showing that not only artificial UV light, but also sunlight could be used as a therapy for rickets, the Vitamin D deficiency disease which in children causes malformation of the skeleton (e.g., Hess & Unger, 1921).

Jo: ...Oh, NOW I get it. "In the dark!"--that was a pun! Ok, so these guys see that UV light helps with rickets, and they say, ok, exposure to UV is key for preventing rickets. And it is true that we humans produce vitamin D in our skin when it's exposed to sun—specifically to UV radiation—which is why I and everyone else in the PNW is vitamin D deficient. We don't get enough sun here to keep up on our bodies' vitamin D needs.

Erik: The physician Murray (1934) was the first one to make the leap from UV helping rickets to try to explain how different human skin colors evolved. He introduced the notion that people have lighter skin at higher latitudes to aid in Vitamin D synthesis, since lack of vitamin D was what was causing rickets in the first place.

Jo: And you're calling it "depigmentation" because we know the first peoples had darker skin, so the question here was, ok, how did people lose pigment to become lighter skinned...?

Jim: that's right. The idea was that people whose ancestors have lived for a long time far from the equator lost their darker skin pigmentation because melanin (skin pigment) absorbs UV light. But for those lower-UV environments further from the equator, you'd need lighter skin to let enough UV radiation through to produce the vitamin D that you, Jo, and all your sickly PNW compatriots need.

Jo: OK, but what about groups of people who live really far from the equator but still have darker skin, like, say, some Inuit groups?

Erik: Murray even accounted for that, proposing that Inuits (although he used the problematic term Eskimos) retained darker skin because they got so much vitamin D from their fish-heavy diets that they didn't need the help of lighter skin to get enough vitamin D.<sup>19</sup>

Jo: Well that's cool, and intellectually it makes a lot of sense. But what about the question of why people started off with darker skin in the tropics in the first place? Didn't murray have anything to say about that? Last I heard in this episode, we were still wrestling with those mythological explanations like Phaeton's journey and Noah's curse to explain darker skin.

Erik: yeah, Murray's explanation for that was one of the more—uh--inventive ones we see in the 20<sup>th</sup> century: tropical neurasthenia.<sup>20</sup> By this he meant that white people in the tropics would get TOO MUCH UV light, and he hypothesizes that this would damage their nervous and reproductive systems, preventing them from surviving in tropical areas and leaving only darker-skinned people there.

Jo: Spoiler! That was not right!

Jim: Other than the skin color-Vitamin D link, in my opinion the most significant development of the 20<sup>th</sup> century was the global skin color map published by the Italian geographer Renato Biasutti in 1940. That same map has been used ever since to bolster explanations for the

geographic distribution of skin color. Versions of it are still being used in refereed publications (Deng & Xu, 2018)!

Jo: Wait. Are you saying that the skin color measurement maps in the 21<sup>st</sup> century are based on a map from 1940?

Erik: I have to hear the story about how this happened.

Jim: It starts with some skin color tiles, the von Luschan tiles, which were a set of 36 somewhat standardized, opaque glass tiles arranged in a chromatic scale.

Jo: Right, I've seen these before. They're actually reminiscent of the tone matching swatches you might use to find your foundation color in a makeup store. You were supposed to put these up against some region of the skin of the person to assess their skin tone. And I'm guessing von Luschan was doing something with these to find the real number of races -- another version of that racial essentialism.

Erik: Good call. Felix von Luschan was a Viennese physician, ethnographer, and archaeologist who studied craniometry in the mid-1800s before becoming the director of the Africa and Oceania section of the Berlin Ethnological Museum. He was one of the founding members of German Society for Racial Hygiene.

Jo: Uh oh.

Erik: I know! But he quit it because it was getting too racist. Von Luschan came up with the 36 shade scale for skin early in the 20<sup>th</sup> century in part because he, like many of his contemporaries, was convinced that even "white" was still several different races. So his scale could be broken down into six racial types: the first four were all "white" -- Celts were the lightest, then Nordic, Alpine, and Mediterranean Europeans, then "Brown," and "Black."

Jo: This doesn't sound too original by this point. I guess I should stop being surprised that really old ideas keep being recycled in stuff that we say is new.

Jim: But, Jo, numbers make it sciencey! So, it was picked up by Renato Biasutti in the book *Le Razze E I Popoli Della Terra* (Races and Peoples of the Earth). He divided von Luschan's colors into 8 uneven splits of the 36 tiles. Then he mapped out the distribution of those 8 groups of skin tones in support of his 5 subspecies, 16 primary races, and 52 secondary races.

Erik: Even that wasn't new. Bristol, England, physician, ethnographer, and archaeologist John Beddoe did this for just Britain and the Continent in the 1880s.

Jo: Like I said, I'm sensing a pattern here.

Jim: Biasutti made a much more complex model—52 ethnographic descriptions of skin color spread across the globe.

Jo: Whoa!

Jim: But! Let's point out some of the problems. First, the von Luschan tiles themselves. Erik, what's the problem with making a chromograph out of glass tiles?

Erik: It's ugly?

Jo: No, I've seen them. They're kind of pretty, actually. Are they too fragile, or expensive to produce or something?

Jim: Maybe the best versions would be expensive. And therein lies the first problem: the color fades.

Erik: Ah, yeah. And then you have no consistency in your sampling.

Jim: Exactly. So that's the second problem. Biasutti drew from published ethnographies that included some indication of skin tone, but there was no attempt at standardization—of either the site of measurement or of perception of the appropriate tile. (Notwithstanding Swiatoniowski, Quillen, Shriver, & Jablonski, 2013).

Erik: I'm surprised he was able to find ethnographies with skin color measurements from all over the globe!

Jim: Ah, and that's problem number three: his sampling errors. He drew his data from 52 ethnographic descriptions (what he called 52 secondary races) that were very unevenly distributed. For example, Europe and Africa are represented by 15 groups—14 of which are spread throughout Africa with Europe being represented by one sample from Poland. Interestingly, he shows 6 different levels of color from Alaska to Yemen with the only sample in between those endpoints coming from Warsaw, Poland!

Jo: I don't get it. How does that help you figure out the racial map of the globe?

Jim: He pretty much made up those areas based on his preconceptions. But he was at least trying to put some data points on the map—only 5 years later a geographer drew black and yellow skin color maps without even pretending he had any data points (Fleure, 1945).

Erik: Don't let a good theory be ruined by something like missing facts, Jo!

Jo: So Biasutti just kind of makes up a good portion of the global distribution of skin color.... But this was the era where we began to see truly modern physical anthropology develop, right? And reflectance spectrophotometry became a thing sometime in the 1960s. I'm guessing Biasutti's map got dropped soon thereafter.

Jim: Nope.

Erik: Wait, what's reflectance spectrophotometry?

Jo: [EXPLAIN] ...Precise measure of the amount of light that gets reflected back from a person's skin. The darker the skin the less gets reflected.

Jim: You'd think these methods would make something as shoddy as Biasutti obsolete quickly. Instead the map was included in a very influential text just when anthropology was experiencing exponential growth as a college major. C. Loring Brace and Ashley Montagu modified Biasutti's map and used it in their 1965 Introduction to Physical Anthropology. They redrew the map from the 1959 3rd edition of Biasutti, collapsing his skin color categories into 5 tones, but of course not directly related to races because they both endorsed a cultural view of race. Unfortunately,

though, ever since then, some version of the map has appeared in most anthropology texts that say anything about human variation.

Jo: And the sampling problem reminds me of what goes on with the direct-to-consumer genomics stuff of 23-and-Me and Ancestry.com.

Jim: It sure seems that way. Physical anthropology did change, though. We aren't completely stuck in the early-20<sup>th</sup> century! Part of the effort to move physical anthropology away from descriptive anatomical works about race into evolutionary explanations was to try to understand skin color as an adaptive phenomenon. Fortunately, the Vitamin D argument was already on the books. In 1950, Carleton Coon, Stanley Garn, and Joseph Birdsell, borrowed Murray's model of UV radiation and Vitamin D synthesis as accounting for skin depigmentation in their *Races: A study of the problems of race formation in man* (Coon, Garn, & Birdsell, 1950).

Jo: For those listeners who don't know, they were bigtime physical anthropologists.

Jim: Yes. Fortunately they didn't buy the other part of Murray's argument about tropical neurasthenia selecting for dark skin. But even in the 1960s, people were still arguing about what was the selective factor for skin color. For example, South African physician, H. P. Wassermann claimed that it wasn't the climate, heat or sun or UV rays, but disease that differed from one area to another that accounted for skin color differences (Wassermann, 1965).xxi

Jo: Just like the leprosy guy! Benjamin Rush!

Erik: Wow that really is the same argument as Rush, physician to the presidents, almost 200 years prior.

Jim: It took a Science article in 1967 to force the UV-Vitamin D—skin color consensus (Loomis, 1967). W. Farnsworth Loomis, a biochemist at Brandeis University argued that most of the variability we see in skin color is due to the UV-Vitamin D relationship.xxii In addition to Murray's argument for depigmentation in higher latitudes, Loomis said that heavily pigmented skin was required in the tropics to prevent the over-synthesis of Vitamin D, which could cause death from kidney failure.

Erik: This sounds like a reasonable hypothesis.

Jim: Yeah, that hasn't stood the scrutiny of time, but we'll discuss that in the next episode. It wasn't until 1978 that someone proposed UV photolysis (the chemical breakdown by UV radiation) of the B vitamin folate as a reason to select for high levels of pigmentation in areas of high UV radiation (Branda & Eaton, 1978) -- although that also has several flaws.

Jo: I want to get into this, because now we're in my medical anthropology territory. But here's the thing. We're talking the last quarter of the 20th century now and I haven't heard either of you mention genetics once! If there was this "internal" vs. "environmental" thing going on in the nineteenth century, did genetics sort of solve the issue in favor of the "internalists"?

Jim: That's ... complicated.

Jo: That's what you always say about genetics.

Erik: Whew. The history of genetics is always complicated. But that is way too big to try to bite off today.

Jim: I agree. Let's come back next time picking up the story from the "internalist" side of things.

Erik: And I think we have to start the next episode with a eugenicist.

Jo: That, I believe, is called a cliffhanger. So, until next time, I'm Jo ...

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## Notes

<sup>1</sup> [https://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999\\_04\\_0057%3Aentry%3D%232329](https://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999_04_0057%3Aentry%3D%232329)

<sup>2</sup> Biblical exegesis by ancient Judaic authorities, in this case found in *Pirkei de-Rabbi Eliezer*.

<sup>3</sup> The blackness which is peculiar to [Africans], and which is not caused by the sun, as many think; for if a black African pair be transported to a cold country, their children are just as black, and so are all their descendants until they come to marry with white women. The cause must be sought for in the peculiar texture of their bodies, or in the seed, or in the blood-which last are, however, of the same colour as everywhere else. (Anonymous, 1684)

<sup>4</sup> The varieties of colour are wonderful. Thus in men we meet with white, black, brown, copper-colour; lastly, all shades between white and black, some having one, and others another. And in order to show this more clearly, I have subjoined a table of the colours of man, as they differ according to race, which I put forward, not as an absolutely correct history of colours, but only as an example and specimen of varieties. Table of Colours. 1. Black: Africans under the direct rays of the Sun, inhabitants of New Guinea, and of New Batavia. 2. Sub-black: The Moors of Northern Africa, The Hottentots, dwelling towards the south of the Continent. 3. Copper-coloured: The East-Indians. 4. Red: Americans. 5. Brown: Tartars, Persians, Arabs, Africans dwelling on the Mediterranean Sea, Chinese. 6. Light brown: Southern Europeans, Sicilians, Abyssinians, Spanish, Turks and others, Samoeides and Laplanders. 7. White: Almost all the remaining Europeans, as Swedes, Danes, English, Germans, Poles and others, Kabardinski, Georgians, Mingrelians, Perhaps we ought to put here the inhabitants of some of the islands in the great Pacific Ocean. (Hunter, 1865 [1775], pp. 366-367)

<sup>5</sup> The dermis [of blacks] is thicker than in the other races, specially on the cranium, the palm, and the sole... The [Malpighian layer], which is the chief seat of the coloration, presents nothing particular as regards its structure... the pigment, is deposited in a shapeless mass, or in granules, chiefly around and in the interior of the nuclei of polyhedral cells, which are disposed in numerous irregular layers. The pigment presents shades of colour according to the position of the cells. The deeper and more coloured cells are of a blackish brown (Hunt, 1865, pp. 20-21, footnote).

<sup>6</sup> One of the most bizarre explanations of skin color is probably from the French Jesuit missionary Joseph-François Lafitau, in his 1724 *Customs of the American Indians Compared with the Customs of Primitive Times*. He explains the dark skin of Africans as coming from some women in the distant past seeing the bodies of their husbands painted black! This so impressed them that their subsequent children were born black.

<sup>7</sup> Hence it will appear, that the Power of the Sun's Heat in hot Countries, and its more immediate Application to the Body, or the Increase of its Force, by the Nature of the Soil, or Ways of Life, is the remote Cause of the Blackness, and the different Degrees of Blackness, of the Inhabitants of the Torrid Zone: Whereas the luxurious Customs, and the effeminate Lives, of the several Nations of white People, in the northern Climes, are the remote Causes of their respective fair Complexions. Q. E. D. (Mitchell, 1744, p. 140)

<sup>8</sup> When man began to disperse himself from climate to climate, his nature underwent several alterations; in the temperate countries, which we suppose to be near where he was originally produced, these alterations were but slight; but they increased in proportion as the distance was greater; and after many centuries had passed away, after continents had been traversed, and generations degenerated by the influence of different climates, he ventured to the extremes, and habituating himself to the scorching heats of the south, and the frozen regions of the north, the changes have become so great, that there is room to imagine the Negro, the Laplander, and the White, different species; were it not certain that there was but one man originally created, and, that the White, the Laplander, and the Negro, can unite and propagate the great family of the human kind. Thus their colours are not original, their dissimilitude being only external and superficial. It is the same being which is tintured with black under the torrid zone, and rendered tawny, with contracted limbs, by the rigour of the cold under the polar circle. (Buffon, 1792b, pp. 316-317)

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<sup>9</sup> The history of the species requires a separate detail, of which the principal facts can only be derived from the varieties that are found in the inhabitants of different regions. Of the varieties, the first and the most remarkable is the colour, the second is the form and size, and the third is the disposition. (Buffon, 1792a, pp. 190-191)

<sup>10</sup> Of the blackness of the skin, the principal cause is the heat of the climate. When this heat is excessive, as at Senegal, and in Guinea, the inhabitants are entirely black; when it is rather less violent, as on the eastern coasts of Africa, they are of a shade more light; when it becomes somewhat temperate, as in Barbary, Mogul, Arabia, &c. they are only brown; and in fine, when it is altogether temperate, as in Europe and in Asia, they are white; and the varieties there remarked proceed solely from the mode of living. All the Tartars, for example, are tawny, while the Europeans, who live in the same latitude, are white. This difference clearly arises from the former being always exposed to the air; having no towns nor fixed habitations; sleeping upon the earth, and living coarsely and savagely. These circumstances are sufficient to render them less white than the Europeans, who want nothing to render life comfortable and agreeable. Why are the Chinese whiter than the Tartars, whom they resemble in all their features? Certainly from the above reasons.

When cold becomes extreme, it produces effects similar to those of excessive heat. The Samoiedes, Laplanders, and Greenlanders, are very tawny; and it is even asserted, that some Greenlanders are as black as those of Africa. Here the two extremes meet. Violent cold and violent heat produce the same effect upon the skin, because these two causes act by a quality which they possess in common. Dryness of the air is this quality; and which cold is as equally productive as intense heat; by either the skin may be dried, and rendered as tawny as what we find it among the Laplanders. Cold compresses all the productions of nature; and thus it is that the Laplanders, who are perpetually exposed to the rigours of frost, are the smallest of the human species. (Buffon, 1792a, p. 349)

<sup>11</sup> The most temperate climate is between the degrees of 40 and 50; where the human form is in its greatest perfection; and where we ought to form our ideas of the real and natural colour of man. Situated under this Zone the civilized countries are, Georgia, Circassia, the Ukraine, Turkey in Europe, Hungary, South Germany, Italy, Switzerland, France, and the North of Spain; of all which the inhabitants are the most beautiful people in the world.

As the principal cause of the colour of mankind, we ought to consider the climate; the effects of nourishment are less upon the colour, yet upon the form they are prodigious. (Buffon, 1792a, p. 350)

<sup>12</sup> The action of the sun and the air is a sort of stimulus to our bodies, and therefore acts according to those laws which regulate stimulants. The effect of this stimulant, burning and irritating the skin, is to render it harder and thicker, as is the case with the hands of labourers, and with the use of all parts of the body which are affected by stimulants. In the same way the air and the rays of the sun, by their stimulating action, render the skin less transparent. The efficient cause, why the skin becomes thicker, is clear, and the way in which it is made thick, whether by the sun or by other irritating subjects, is pretty much the same. The irritation of the parts brings with it a larger influx of humours, and increases the action of the vessels, which are used in their increment or reparation. And as the continuous action of the sun, and other influences which stimulate the skin, display a great resemblance of action, so the progress of the acting power is the same in either case. Stimulants and irritants, when first applied to a yet tender skin, cause the appearance of many pimples; but after a certain lapse of time, it becomes harder, thicker, and at last callous, and can never afterwards be inflated into pimples by the same causes. And in like manner, although the rays of a southern sun burn our bodies, and cause many pimples to rise on the skin, still bodies accustomed to those regions, or those who have always been in the way of it, are not affected in the same manner.

The fact therefore of the skin being made thicker by the intemperance of the climate and the heat of the sun, and blacker by the direct rays of the sun and by pigments, proves our whole theory of colour. (Hunter, 1865 [1775], pp. 371-372)

<sup>13</sup> We now know, namely, that human blood becomes black simply by being overloaded with phlogiston (in the same way that a cake of blood is seen on the underside). The strong smell of the Negroes, which cannot be avoided by means of any degree of cleanliness, is already a reason to suppose that their skin removes a great deal of phlogiston from the blood and that nature must have organized the skin in them in such a way that the blood can dephlogistisize itself by means of the skin in far greater measure than happens in us, in whom such dephlogistization is for the most part an activity of the lungs. However, the genuine Negroes also live in regions in which the air is so phlogistisized in consequence of thick woods and areas overgrown with swamps that, according to Lind's report, it is mortally dangerous for the English sailors to travel for even one day up the Gambia River in order to buy meat. It was, therefore, a very wise arrangement of Nature to organize their skin in such a way that the blood might be able to dephlogistisize itself by this means much more strongly than in us, since the blood, by means of the lungs, does not remove nearly enough phlogiston. The blood must, therefore, have transported a large amount of phlogiston into the ends of the arteries. Consequently, at this spot, which is under the skin itself, the blood must be overloaded with phlogiston and shows through black even though it is red enough directly inside the body. Besides, the difference in the organization of the skin of the Negro from ours is already noticeable even from its feel. — As for the purposiveness of the organization of the other races, we cannot, I admit, make any inferences based on color that have the same degree of probability. We are, however, not entirely without explanations of skin color that could support the previous supposition of purposiveness. If Abbot Fontana is correct when he claims (in opposition to the view of the knight Landriani) that the fixed air pushed out of the lungs with every exhalation is not precipitated out of the atmosphere but might instead come from the blood itself, there certainly could be a human race with blood so overloaded with this acidic air that the lungs alone could not remove it. The skin receptacles would, therefore, also need to contribute to this process (though not in the air form, but bound instead with other transpired substances).

<sup>14</sup> It has been a popularly-received error, from time immemorial, that degrees of latitude, or in other words, temperature of countries, were to be regarded as a sure index of the color and of certain other physical characters in races of men. This opinion has been supported by many able writers of the present century, and even in the last few years by no less authority than that of the distinguished Dr. Prichard, in the *"Physical History of Mankind."* A rapid change, however, is now going on in the public mind in this respect, and so conclusive is the recent evidence drawn from the monuments of Egypt and other sources, in support of the permanence of distinctly marked types of mankind, such as the Egyptians, Jews, Negroes, Mongols, American Indians, etc., that we presume 110 really well-informed naturalist will again be found advocating such philosophic heresies. Indeed, it is difficult to conceive how any one, with the facts before him, (recorded by Prichard himself,) in connection with an Ethnographical Map, should believe that climate could account for the endless diversity of races seen scattered over the earth from the earliest dawn of history. (Nott & Gliddon, 1854, p. 63)

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- <sup>15</sup> It is true that most of the black races are found in Africa ; but, on the other hand, many equally black are met with in the temperate climates of India, Australia, and Oceania, though differing in every attribute except color. A black skin would seem to be the best suited to hot climates, and for this reason we may suppose that a special creation of black races took place in Africa. The strictly white races lie mostly in the Temperate Zone, where they flourish best; and they certainly deteriorate physically, if not intellectually, when removed to hot climates. Their type is not in reality changed or obliterated, but they undergo a degradation from their primitive state, analogous to the operation of disease. The dark-skinned Hyperboreans are found in the Frigid-Zone; regions most congenial to their nature, and from which they cannot be enticed by more temperate climes. The Mongols of Asia, and the aborigines of America, with their peculiar types, are spread over almost all degrees of latitude. (Nott & Gliddon, 1854, pp. 63-64)
- <sup>16</sup> Of all the differences between the races of man, the colour of the skin is the most conspicuous and one of the best marked. It was formerly thought that differences of this kind could be accounted for by long exposure to different climates; but Pallas first shewed that this is not tenable, and he has since been followed by almost all anthropologists. This view has been rejected chiefly because the distribution of the variously coloured races, most of whom have long inhabited their present homes, does not coincide with corresponding differences of climate. Some little weight may be given to such cases as that of the Dutch families, who, as we hear on excellent authority, have not undergone the least change of colour after residing for three centuries in South Africa. An argument on the same side may likewise be drawn from the uniform appearance in various parts of the world of gypsies and Jews, though the uniformity of the latter has been somewhat exaggerated. A very damp or a very dry atmosphere has been supposed to be more influential in modifying the colour of the skin than mere heat; but as D'Orbigny in South America, and Livingstone in Africa, arrived at diametrically opposite conclusions with respect to dampness and dryness, any conclusion on this head must be considered as very doubtful. (Darwin, 1871, p. 209)
- <sup>17</sup> From race chapter (VII): We have thus far been baffled in all our attempts to account for the differences between the races of man; but there remains one important agency, namely Sexual Selection, which appears to have acted powerfully on man, as on many other animals. I do not intend to assert that sexual selection will account for all the differences between the races. An unexplained residuum is left, about which we can only say, in our ignorance, that as individuals are continually born with, for instance, heads a little rounder or narrower, and with noses a little longer or shorter, such slight differences might become fixed and uniform, if the unknown agencies which induced them were to act in a more constant manner, aided by long-continued intercrossing. Such variations come under the provisional class, alluded to in our second chapter, which for want of a better term are often called spontaneous. Nor do I pretend that the effects of sexual selection can be indicated with scientific precision; but it can be shewn that it would be an inexplicable fact if man had not been modified by this agency, which appears to have acted powerfully on innumerable animals. It can further be shewn that the differences between the races of man, as in colour, hairiness, form of features, &c., are of a kind which might have been expected to come under the influence of sexual selection. (Darwin, 1871, pp. 214-215)
- From end of section III: Colour of the Skin.- The best kind of evidence that in man the colour of the skin has been modified through sexual selection is scanty; for in most races the sexes do not differ in this respect, and only slightly, as we have seen, in others. We know, however, from the many facts already given that the colour of the skin is regarded by the men of all races as a highly important element in their beauty; so that it is a character which would be likely to have been modified through selection, as has occurred in innumerable instances with the lower animals. It seems at first sight a monstrous supposition that the jet-blackness of the negro should have been gained through sexual selection; but this view is supported by various analogies, and we know that negroes admire their own colour. With mammals, when the sexes differ in colour, the male is often black or much darker than the female; and it depends merely on the form of inheritance whether this or any other tint is transmitted to both sexes or to one alone. The resemblance to a negro in miniature of *Pithecia satanas* with his jet black skin, white rolling eyeballs, and hair parted on the top of the head, is almost ludicrous. (Darwin, 1871, pp. 627-628)
- <sup>18</sup> For a recent statement about the problem with some of the material in the 150 year old *The Descent of Man*, see Fuentes (2021).
- <sup>19</sup> If the criteria of natural selection have any value whatever, it would seem that the interaction of these three factors, namely, food vitamin D, sunlight, and metabolism in rickets, can account in part at least for certain differences in race color in high latitudes: for the blondness of the Scandinavian on the inland plateaus of the sub-arctic and the blackness of the Eskimo on the polar seashores. (Murray, 1934, p. 441)
- <sup>20</sup> There is much to suggest that tropical neurasthenia is the result of too intensive solar radiation, the response of the nervous system to too much ultra violet light absorption through unpigmented skin. There is much to suggest that a symptom-complex, nervous and reproductive, is the evolutionary disease factor that reacted with excessive light and unpigmented skin to prevent survival or colonization of white races and to develop and establish the colored races in the tropics, and that this symptom-complex is still functioning as the dead-line for whites in the torrid zone, just as osteomalacia is the dead-line for colored races in the darkness of the Arctic. (Murray, 1934, p. 444)