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## The Dermatologist and Color

Andrzej Grzybowski

*University of Warmia and Mazury; Institute for Research in Ophthalmology*

Lawrence Charles Parish

*Thomas Jefferson University*

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## The Color of Skin

The idea for an issue on color and the skin was initiated by the 2017 exhibit “Breathing Color” that had been created by the new Design Museum in London, England. While variations in color may play a significant role in diagnosing a skin disease, little attention has been directed towards the influence that color may be used to identify a dermatologic disease and even monitor a therapeutic agent. The reader need only to recall how early dermatology atlases were hand colored to provide a more realistic picture of a disease.<sup>1</sup>

Color continues to be an integral part of the diagnostic and therapeutic processes. Like gender, it helps to focus the clinician on narrowing the differential diagnosis.<sup>2</sup> As important as color should be, we have found specific attention to color in just two textbooks.<sup>3,4</sup>

An aspect to which little attention has been given is how the clinician recognizes color. Even if one were to recall the primary colors from grammar school, the definitions change from culture to culture.<sup>5-7</sup> Another complication may involve color blindness. If he or she may be color blind, as in the case of J. Graham Smith, Jr (1928-2010), the founding editor of the *Journal of the American Academy of Dermatology*, how does the clinician compensate?<sup>8</sup>

We have provided introductory sections on the concept of light, the physiology of melanin, ethnic differences, and psychiatric aspects concerned with skin color. Two distinguished skin biologists, both from Brown University, Providence, RI, Walter Quervado (1930-2010)<sup>9</sup> and William Montagna (1947-2013) had published pioneer work on pigmentation.<sup>10,11</sup> There is also an extensive literature on how racial differences are perceived by the clinician.<sup>12</sup> As unbiased as one may be, words of color often convey a variety of meaning, some intended and some not intended<sup>13,14</sup>

### Background

The issue begins with the background of how color is perceived, with Grzybowski and Kupidura-Majewski pointing out that the human eye recognizes visible light that represents a small portion of the electromagnetic spectrum. There are three concepts for the perception of color: the trichromatic color theory, the opponent process theory, and the zone theory.<sup>15</sup>

M. Lambert and her group have provided a superb analysis of the current status of melanocyte production and how eumelanin creates color in people. This has been a life-long work, as shown in Figure 1 of her early associates at the Massachusetts General Hospital in Boston, MA. (Figure 1)<sup>16</sup>

Skin color often is used to define the patient and to provide information about the ethnic background. Such information may be significant in arriving at an appropriate diagnosis of the cutaneous affliction, as Jothishankar and Stein have shown.<sup>17</sup>

V. Gupta and Sharma have put into perspective the role of the Fitzpatrick scale and how the skin responds to sun exposure, since its introduction by Thomas Fitzpatrick (1919-2004) in 1975. While there may be other scales, this remains the gold standard.<sup>18</sup>

M. and A. Gupta say it all, when they write, “Skin color is one of the major attributes that defines both individual distinctiveness and differences between groups.” They discuss the psychologic and psychiatric aspects of color changes of the skin, being iatrogenic or pathogenic.<sup>19</sup>

### **Various Colors**

The next section of the issue elaborates on the color changes to the skin due to cutaneous and systemic diseases. We have arbitrarily selected ten colors for discussion of various dermatologic entities. The three primary colors are red, yellow, and blue, and when mixed, they can provide a number of different colors, although the concept of what colors are primary has changed over time.  
5-7

Black diseases of the skin, nails, and mucosa are discussed by Qui et al. They have included such diseases as acanthosis nigricans obviously black and calciphylaxis that might not often be considered in this group.<sup>20</sup>

The presentation of blue conditions also provides for some surprises. P. Cohen enumerates such diseases as the well-known argyria to blueness created by ingesting FD&C blue dye no.1.<sup>21</sup>

The Kutlubay group have found a myriad of diseases that can appear brown. These range from Schamberg’s disease (progressive pigmented purpura) to Riehl’s melanosis and poikiloderma of Civatte.<sup>22</sup>

Lichen planus pigmentosus and erythema dyschromicum perstans are just some of the cutaneous maladies that may appear to be gray. Abdel-Naser has also discussed hereditary conditions that include incontinentia pigmenti and hypomelanosis of Ito, along with the “gray baby syndrome” caused by chloramphenicol.<sup>23</sup>

Ghosh and Bandyopadhyay provide an exhaustive list of those skin diseases that can appear to be green. These include the well-known pseudomonas nail infection to greenish discoloration of the hands and feet that once occurred due to prescriptions that contained brilliant green.<sup>24</sup>

Sarcoidosis and pityriasis rubra pilaris may present with orange coloration. Soundararajan et al also point out that Fox-Fordyce spots and sebaceous adenomas can have orange appearances.<sup>25</sup>

Steuer and Cohen have observed that purplish discoloration can range from the pigmented purpuric dermatoses to various vasculides. Cryoglobulinemia and eosinophilic granulomatosis with polyangiitis (Churg-Strauss syndrome) may also have a purplish presentation.<sup>26</sup>

Red diseases might represent the most common skin conditions. The presentations of atopic dermatitis, contact dermatitis, and seborrheic dermatitis are often all red. Rosacea, by definition, has redness, as do cherry angiomas, as Elias et al point out.<sup>27</sup>

Brown and her group have included such white diseases as albinism and its associated syndromes, along with the more common halo nevus of Sutton and the less common malignant atrophic papulosis (Degos' disease). They also remind us of the atrophic scar that can be induced by intralesional steroids.<sup>28</sup>

The Logans have provided a detailed account of yellow diseases. They enumerate the pathways for this discoloration to occur: skin surface changes, lipid accumulation, structural changes, and circulatory hyperpigmentation.<sup>29</sup>

### Conclusions

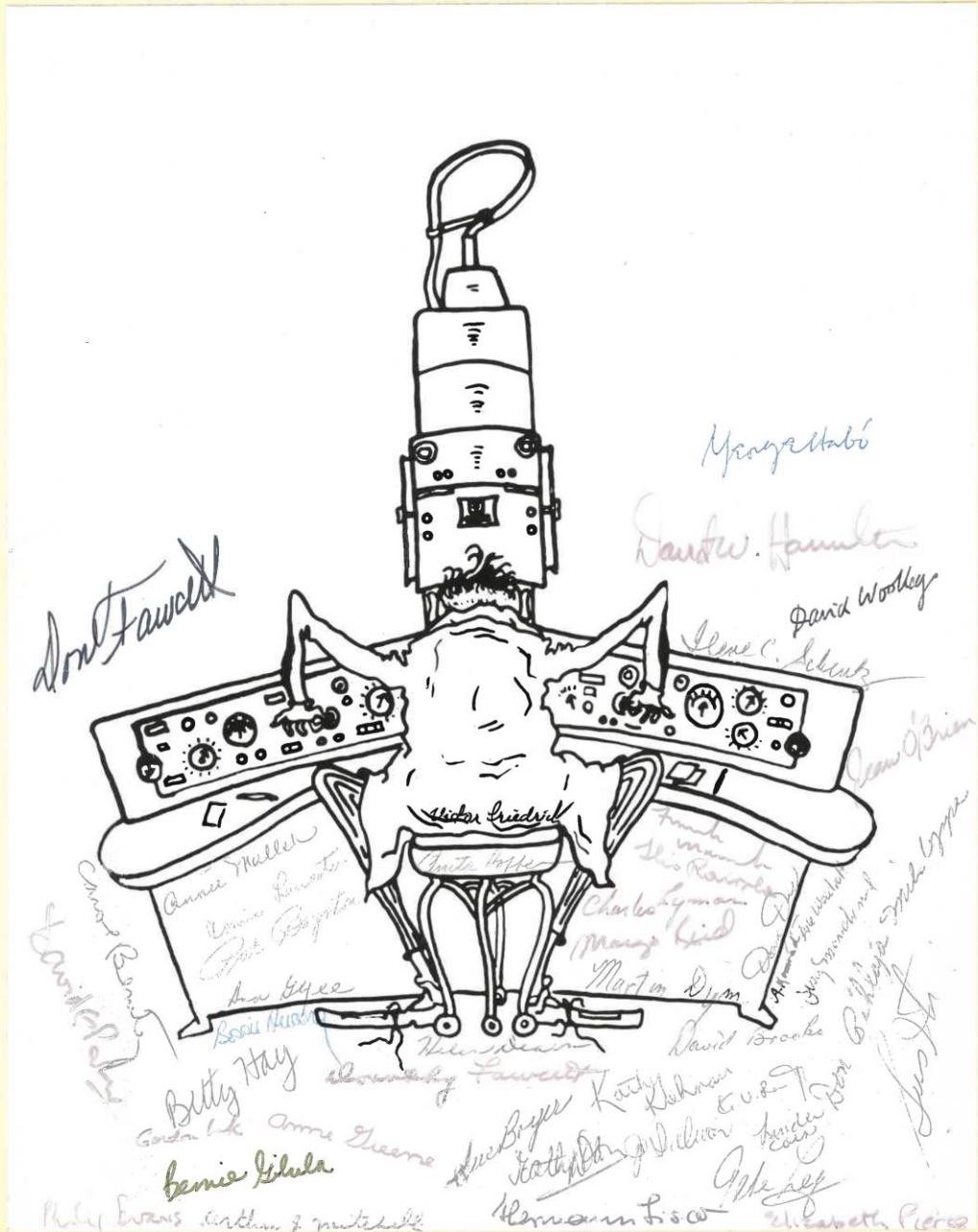
We hope that you, the reader, will find this issue of *Clinics in Dermatology* as informative as we have in preparing it.

Andrzej Grzybowski, MD, PhD, MBA  
Chair of Ophthalmology  
University of Warmia and Mazury  
Warszawska 30 Olsztyn 10-082, Poland  
[ae.grzybowski@gmail.com](mailto:ae.grzybowski@gmail.com)

Lawrence Charles Parish, MD, MD (Hon)  
Clinical Professor of Dermatology and Cutaneous Biology  
Director of the Jefferson Center for International Dermatology  
Sidney Kimmel Medical College at Thomas Jefferson University  
1845 Walnut Street, Suite 1650  
Philadelphia, PA 19103  
[larryderm@yahoo.com](mailto:larryderm@yahoo.com)

Uwe Wollina, MD, PhD  
Head of Dermatology and Allergology  
Municipal Hospital Dresden  
Academic Teaching Hospital Dresden-Friedrichstadt  
Dresden, Germany  
[wollina-uw@khdf.de](mailto:wollina-uw@khdf.de)

MURIEL WIKSWO



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