

# Conflict Colors

## Grace Moon

Grace Moon is an artist, writer, and adjunct professor in the communication design programs at CUNY City Tech and Kean University. Her writing has been published online at *Guernica Magazine* and *Public Books*. [prof.moon@gmail.com](mailto:prof.moon@gmail.com)



**ABSTRACT** Designers often celebrate color without considering where it comes from. This paper explores the origins of our modern colors and asks if they may compromise design ethics. Today, colors are created by large chemical corporations, who will fully obfuscate their production and supply chains. NGO watchdog groups and government agencies have evaluated the conditions of production for many of the mineral resources used in the production of these chemicals and declared the materials to be “conflict minerals.” This paper hopes to shed light on the complexity of the global colorant supply chain so artists and designers may know the potential humanitarian and geopolitical impact of our materials.

**KEYWORDS:** color, color theory, ecocriticism, conflict minerals, conflict resources; colonialism, capitalism

## Introduction

The marketing material of Pantone’s color of the year 2018 reads: “A dramatically provocative and thoughtful purple shade, *Ultra Violet* communicates originality, ingenuity, and visionary thinking that points us toward the future.” *Color of the Year* is a marketing device adopted by the design industries to commodify color. International consortiums of design professionals such as “Color Marketing Group” (of which



**Figure 1**

Modern pigments from the Forbes Pigment Collection of the Harvard Art Museums.  
Photo: Grace Moon.

Pantone is a member) devote considerable time and resources each year to decide what color should be promoted and how to sell it (Cook 2016; Color Marketing Group 2018). Oblivious to the commerce of color, we designers have not bothered to ask what these *color experts* are actually selling us. What are our modern colors made of and where do they come from?

My inquiry into modern color began early in 2015 when I made a trip to Golden Artist Color, an artist paint manufacturer in upstate New York. My visit to Golden was followed by a visit to Gamblin Artist Color in Portland, Oregon and a tour of the Forbes Pigment Collection at Harvard Art Museums (Figure 1). Through these visits, I learned that modern color is made by international chemical corporations, and the colorants used by designers in the form of ink, paint, and dye are used across a broad spectrum of other industries

including architectural and automotive coatings, cosmetics, food, pharmaceuticals, printing, paper, plastics, and textiles. In other words, the white pigment in your sunscreen is the same as the pigment in a tube of artist paint.

When synthetic color was invented in the nineteenth century, chemists and chemical manufacturers took over the production of color (Huber, Menzi and CIBA 1959; Blaszczyk 2012, xiv). Today, in order to produce colorants, the chemical industry relies on processors and suppliers of the requisite raw material. Multi-national corporations dig up the world's minerals, operating primarily in developing nations where minerals are abundant and regulations lax or non-existent. This results in economic corruption and human rights abuses; in some of the most extreme cases, the United Nations designates exploited resources "conflict minerals" (United Nations Security Council 2001). In design theory, research, and teaching, globalism and sustainability are hot topics, but rarely do we discuss those issues in relation to color ink, dye, and pigment. Most of the focus on sustainability has been on recycling or upcycling already processed materials. For example, when thinking about package design, graphic designers have used less material as well as recycled materials to reduce their carbon footprint. And in the realm of product design, some Adidas soccer jerseys are now made from ocean plastic (Anderson 2018). But if designers are to truly uphold the ethical standards demanded by AIGA's "Standards of Professional Practice" (1994), which outline a designer's responsibility to clients, the public, communities, and the environment, and "The Living Principles" framework (AIGA 2009), which focuses specifically on sustainability, we must also consider the supply chain of virgin materials, such as those necessary in the making of color.

### **Problems with the Substance of Color**

Modern technology has afforded designers a remarkable plethora of choice. Consider, for example, Adobe Creative Suite, which offers a palette of over a million colors. Color management systems promise that these hues are precisely reproducible across every color space. Technology also makes color available such that those who use it never have to touch, mix, or make color. Industry produces color "readymade," so a designer need not know the recipe for a given color in order to use it (de Duve 1986). One advantage of this is that color is democratized. However, this also has the effect of distancing designers from developing an intimate material, intellectual, and ethical understanding of color.

For example, as a graphic designer I had never wondered about the origins of my print color. I figured that was the job of the press shop. It was only when doing illustrative work in paint that I began thinking more about the materiality of color. I ran out of a particular tube of paint, and when I went to the store to replace it, I learned that it was no longer being produced. I realized that my students,

who tend to work exclusively in digital color, likely had the same blind spot. Thus, now in my basic design course, all of the color theory projects are deliberately assigned using paint. This may be the only time the students touch color while they are in design school. Connecting to the materiality of color is one way to think about the relationship between design and the real world. It is a way to begin a conversation about the ethical problems that underlie the supply chain.

### **The Colorant Industry**

From road signs to toys, virtually all manufactured goods are colored by pigments and dyes available from the global marketplace. These colors are registered through The Color Index International, a database jointly maintained by the Society of Dyers and Colourists headquartered in the United Kingdom and the American Association of Textile Chemists and Colorists in the United States (Color Index 2018). There are approximately 27,000 individual registered colorant products used in coatings, plastics, papers, printing inks, textiles, etc. In 2014, the colorant market generated \$22.86 billion, and it is expected to grow to \$31 billion by 2023 (Transparency Market Research 2016).

Though the industry is vast, most designers do not have direct access to dyes and pigments. We rely on intermediaries like Pantone. By creating a proprietary color matching system, Pantone has established itself as an indispensable authority on and resource for color. Pantone's 1,800 plus hues, shades, and tints, are derived from eighteen base inks. These inks are not necessarily made by Pantone, and to choose a Pantone color is to choose a formula, not an ink. The ink could have been made in Korea or Canada and the actual colorant sourced from a different continent entirely. When colors for designers are categorized alpha numerically as part of a CYMK or RGB color space, it's easy to forget that color comes from somewhere.

### **The Raw Material of Color**

Both organic and inorganic matter are processed into colorants as a pigment or a dye. This matter is often listed on tubes of artist paint: "Quinacridone Red," for example, is derived from an organic substance called quinacridone, while "Titanium White" is made from an inorganic mineral (Figure 2). Our entire modern world is made of chemicals derived from petroleum (organic) or minerals (inorganic). Our colorants are related to our cell phones, cars, clothes, and pills insofar as they are made of the same organic and inorganic stuff. Everything we touch is made from or fashioned by these extractive resources.

These resources are sourced from around the world. Different minerals are found in varying concentrations in locations around the



**Figure 2**

Quinacridone Violet (PV 19) and Titanium White (PW 6). Photo: Grace Moon.

globe. Africa is home to one of the largest – if not the largest – mineral industry in the world (United States Geologic Society 2013). According to the African Development Bank Group (2012) many resource-rich countries – most of whom lack the infrastructure or machinery necessary for extraction and refining – rely on foreign corporations to mine their ore and drill oil. Once that foreign corporation has acquired the raw material, it is exported abroad for processing, whereupon the host country loses a significant amount of potential capital. Additionally, foreign companies benefit from the low cost of mining in Africa, rather than mining in developed countries where regulations are more stringent and the cost of labor higher. For example, in 2012 Australian-owned BHP Billiton, the world's largest mining group, canceled approximately US\$40 billion worth of projects in Australia and increased their presence in Africa. It was simply cheaper for them to do business in Africa.

Take, for example, titanium, a mineral used to manufacture white paint and the most used pigment in the world (European Coatings 2016). Kenmare is an Irish-owned company that operates the Moma mine in Mozambique, one of the largest titanium ore deposits in the world. From 2007 to 2013, the company did not pay corporate income tax (Brynildsen 2013), nor did it fulfill infrastructure development promises made after their Moma mine displaced the local population (Bowker 2014). It may not be illegal for an Irish company to rent land for mining in Africa. However, the system itself allows for corruption to flourish, enabling corporations and government elites to hide wealth in offshore accounts, transforming government funds into personal assets. When a foreign corporation leases land for

extraction, government elites can easily skim economic rent (i.e. the funds paid to the host country for a privileged claim). As *Financial Times* African correspondent Tom Burgis (2015, 5) suggests, economic rent is little more than “unearned revenue” which awards “foreign companies a license to pump crude or dig up ores” while fostering kleptocracies across the continent.

### **Conflict Minerals**

The exploitation of resources can take a more explicitly violent turn when they are found in conflict zones. In 2000, the United Nations created a research panel to look into what natural resources were being exploited in war-torn regions of central and west Africa and discovered that tin, tungsten, tantalum, and gold (together known as 3TG) from the Democratic Republic of Congo (DRC) were funding militias.

3TG were being purchased by companies in the US, the EU, and Asia as essential metals in the production of mobile technology (Nukwege 2015). Though in 2010, the United States signed into law the Dodd-Frank Wall Street Reform and Consumer Protection Act, designed to restrict publicly traded companies from sourcing conflict minerals from the DRC by requiring corporations to file a supply chain worksheet (United States Securities and Exchange Commission 2012), not much has changed. While “seventy-nine percent of US companies have failed to check or disclose whether or not they are using conflict minerals” (Amnesty International 2015), other companies have simply declared them necessary for their production. For example, in 2016 the Dow Chemical Company stated “that certain Conflict Minerals were necessary to the functionality or production of certain products manufactured by Dow” (DowDuPont 2015). Nine Dow businesses utilize conflict minerals, and conflict minerals were present in products from forty-two others. Dow adds in their own defense: “Because the Conflict Minerals enter the Company’s supply chain many layers removed from Dow, it is difficult to determine where they originated.”

### **Blood Colors**

The case of cobalt – the essential mineral in the production of both blue and violet hues – is particularly troubling. In 2016, Amnesty International and Africa Watch released a report detailing the use of child labor in cobalt mines of the DRC. The report identified “children as young as seven working alongside larger industrial operations” where they scavenge for cobalt in the rubble of discarded rocks with crude tools or by hand (Amnesty International and Africa Watch 2016) (Figure 3). This process is often euphemistically described as “artisanal mining.” But artisanal mining regulations, designed to protect workers in hazardous conditions and stop child labor, are not enforced in the DRC.



**Figure 3**

Children sorting cobalt ore. Photo courtesy of © Amnesty International and Afrewatch, 2016.

After cobalt is mined, it moves from the trader to the smelter, and then out of Africa and into the high tech components manufactured on other continents. In China, it is processed further into various chemical forms and then sent on to manufacturers in Korea and Japan who transform the processed cobalt into component parts for electronic devices sold to Apple, Dell, HP, Lenovo/Motorola, LG, Microsoft, Samsung, Sony, auto manufacturers, and a host of other popular companies (Amnesty International and Africa Watch 2016; Frankel 2016). Dow is right: it is almost impossible to trace this pigment back to its mineral source. These refineries and parts makers, I would argue, become launderers of cobalt; by mixing them with ores from acceptable sources, identifying the original sources of these minerals is almost impossible. But there is a 48 percent chance that Congolese cobalt is in any given product manufactured with cobalt.

### **Conclusion**

I do not know exactly what the colorants used by the print industry are made from. So I end with this hypothetical: if we knew that Pantone *Ultra Violet* was made using cobalt, could we in good faith pronounce this color as “visionary” or “thoughtful”? AIGA’s definition of Design Ethics is “based on respect for clients, other designers, audiences, society and the environment.” When it comes to color, are we practicing ethically?

## Disclosure Statement

No potential conflict of interest was reported by the author(s).

## References

- African Development Bank Group. 2012. "Mining Industry Prospects in Africa" [afdb.org](http://www.afdb.org/en/blogs/afdb-championing-inclusive-growth-across-africa/post/mining-industry-prospects-in-africa-10177/), December 26, <http://www.afdb.org/en/blogs/afdb-championing-inclusive-growth-across-africa/post/mining-industry-prospects-in-africa-10177/>
- AIGA. 1994. "Standards of Professional Practice." Accessed June 17, 2018 <https://www.aiga.org/standards-professional-practice/>
- AIGA. 2009. "Design Business & Ethics." Accessed March 2, 2018. <https://www.aiga.org/design-business-and-ethics>.
- Amnesty International and Africa Watch. 2016. "This is What We Die For: Human Rights Abuses in the Democratic Republic of the Congo Power the Global Trade in Cobalt." <https://www.amnesty.org/download/Documents/AFR6231832016ENGLISH.PDF>
- Amnesty International. 2015. "Digging for Transparency: How U.S. Companies are Only Scratching the Surface of Conflict Minerals Reporting." April 22. <http://www.amnestyusa.org/research/reports/digging-for-transparency-how-u-s-companies-are-only-scratching-the-surface-of-conflict-minerals-reporting/>
- Anderson, Cara. 2018. "Adidas Created Earth Day Soccer Jerseys Made From 'Upcycled' Plastic Ocean Waste." April 11. <https://www.adweek.com/creativity/adidas-created-earth-day-soccer-jerseys-made-from-upcycled-plastic-ocean-waste/>
- Blaszczyk, Regina Lee. 2012. *The Color Revolution*. Cambridge, MA: MIT Press.
- Bowker, Tom. 2014. "Kenmare Resources Criticized in Mozambique for Impact of Mine." Bloomberg, December 5. <http://www.bloomberg.com/news/articles/2014-12-05/kenmare-resources-criticized-in-mozambique-for-impact-of-mine>
- Burgis, Tom. 2015. *Looting Machine; Warlords Tycoons, Smugglers and the Systemic Theft of Africa's Wealth*. London, UK: William Collins.
- Brynildsen, Oygunn. 2013. "Mining without development: The case of Kenmare Moma mine in Mozambique." European Network on Debt and Development, December 5. <http://www.euroad.org/Entries/view/1546082/2013/12/05/Mining-without-development-The-case-of-Kenmare-Moma-mine-in-Mozambique>
- Color Index. 2018. Accessed March 16, 2018. <https://colour-index.com/about>.
- Color Marketing Group. 2018. Accessed February 4, 2018. <https://colormarketing.org>.
- Cook, Kim. 2016. "A peek inside the world of color forecasting," Chicago Tribune, September 1. <http://www.chicagotribune.com/lifestyles/home/sc-color-forecasting-consumer-0901-20160831-story.html>.



- de Duve, Thierry. 1986. "The Readymade and the Tube of Paint," ArtForum, May 1. <https://www.artforum.com/print/198605/the-readymade-and-the-tube-of-paint-35050>.
- DowDupont. 2015. "Dupont Investor Reports, Form SD." Accessed August 3, 2016. <http://investors.dupont.com/investor-relations/filings-and-reports/reconciliations-and-other-data/default.aspx>
- European Coatings. 2016. "Titanium dioxide remains the most-in-demand type of pigments," March 18. Accessed June 17, 2018. <http://www.european-coatings.com/Markets-companies/Raw-materials-market/Titanium-dioxide-remains-the-most-in-demand-type-of-pigments>.
- Frankel, Todd C. 2016. "The Cobalt Pipeline, Tracing the path from deadly hand-dug mines in Congo to consumers' phones and laptops." Washington Post, September 30. <https://www.washingtonpost.com/graphics/business/batteries/congo-cobalt-mining-for-lithium-ion-battery/>.
- Huber, George Leo, Karl Menzi and CIBA Limited. 1959. *The Story of Chemical Industry in Basle*. Olten and Lausanne, Switzerland: Urs Graf Publishers.
- Nukwege, Denis. 2015. "Tracing the Source of 'Conflict Minerals.'" New York Times, April 22. Accessed September 15, 2016. <http://www.nytimes.com/2015/04/23/opinion/tracing-the-source-of-conflict-minerals.html>
- Pantone. 2018. "PANTONE 18-3838 Ultra Violet." Accessed March 2, 2018. <https://www.pantone.com/color-intelligence/color-of-the-year/color-of-the-year-2018>.
- Transparency Market Research. 2016. "Global Pigments Market: Report Analyst's Estimations." Accessed July 21, 2016. <https://www.transparencymarketresearch.com/pressrelease/pigments-market.htm>.
- United States Geologic Society. 2013. "Africa and the Middle East." Accessed July 25, 2016. <http://minerals.usgs.gov/minerals/pubs/country/africa.html>.
- United States Securities and Exchange Commission. 2012. "Fact Sheet; Disclosing the Use of Conflict Minerals." Accessed September 23, 2016. <https://www.sec.gov/News/Article/Detail/Article/1365171562058>.
- United Nations Security Council. 2001. "Report of the Panel of Experts on the Illegal Exploitation of Natural Resources and Other Forms of Wealth in the Democratic Republic of the Congo." Accessed August 7, 2016. *United Nations*. [http://www.un.org/en/ga/search/view\\_doc.asp?symbol=S/2001/357](http://www.un.org/en/ga/search/view_doc.asp?symbol=S/2001/357).