

TALES

FROM

THE

CITY

OF

GOLD



Liz Sales is an artist, writer, and educator with an interest in the relationship between technology and perception. She is a faculty and staff member at the International Center of Photography.



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Gold is the most noble of the noble metals. Its properties are unaffected by air, water, or time. Thus, its alchemical associations with perfection and immortality persist today. Its celestial associations are rooted in materiality as well, as virtually all gold on the planet arrived here by meteorite. Two billion years ago, an asteroid collision created the largest accessible gold deposit on Earth, the 'Witwatersrand Basin.'¹ The most gold ever mined has been extracted from the south ridge of this astronomical depression, now called Johannesburg, South Africa.² Here, the noble metal is liquefied by heavy metals for ease of extraction, making mining a type of reverse transmutation, an anti-alchemy, turning land from gold to mercury.



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¹
Jason Kirk, Joaquin Ruiz, John Chesley, and Spencer Titley, "The Origin of Gold in South Africa," *American Scientist* 91 (2003): 34-36.

²
Nick Norman and Gavin Whitfield, *Geological Journeys: A Traveller's Guide to South Africa's Rocks and Landforms* (Johannesburg: Struick Publishers, 2006), 40.

In June 2010, when social documentarian Jason Larkin first arrived in Johannesburg on vacation, the city of gold was alight with celebration, hosting the 19th World Cup. Amidst the excitement, Larkin noticed the alien mounds of crushed yellow rock that comprise the city’s backdrop, distinct from the natural red-brown soil. He learned that this integral part of the city’s topography is the man-made waste product of mining—gold ore dumps—and that, despite their toxicity, these “tailings” are home to millions of people.

Back home in London, Larkin’s fascination continued to grow. “Three weeks before we left Johannesburg, I decided to start exploring the mines with my camera. Once I was home, I kept returning to the photographs I’d taken,” Larkin told *Conveyor*. “Finally, I convinced my girlfriend to move to Johannesburg with me so I could do my research locally and document the mines.” After relocating to South Africa in 2011, Larkin began investigating the largely lawless artificial topographies and their history in a project that spanned the next two-and-a-half years of his life. The resulting work pictures Johannesburg’s physical fractures as well as the ruptures that gold mining has left in its environmental and in its social landscapes.

This is Larkin’s second major, long-term social documentary project. It follows *Cairo Divided*, an equally surreal body of work investigating the satellite-cities project that has terraformed the hostile desert surroundings of Cairo. With so much of the photographic universe speeding up, Larkin feels that it is important to take a slower approach to his practice. He expands, “I was frustrated with the way twenty-four hour, competitive media pushes photographers to take less and less time to tell a story, posting pictures online before they even have captions. For this project, I wanted the benefit of living in Johannesburg and the luxury of doing unhurried work. By living in [there], I was able to set up meetings with local experts and government officials. Although, just having the opportunity to speak to local residents was helpful, as well. It’s a big subject to tackle, six billion tons of mining waste.”

Throughout his exhaustive research, Larkin also collected information, archival images, and idiosyncratic phrases from a two-way Fanagalo dictionary, a *lingua franca* based on the Zulu, English, and Afrikaans languages. The name “Fanagalo” means “do it like this” in Nguni, signaling the language’s use as a tool of authority.³ Larkin explains: “Fanagalo was created by English colonialists in

the nineteenth century so that white mine bosses could command workers who spoke a number of different languages. Fanagalo is still spoken today, which I think says a lot about the legacy of the mining industry.”

Incorporating this level of inquiry into his process allowed Larkin’s photographic work to palpably engage with the complex history of his subject matter. His images show remnants of the past in the present day and put the everyday here and now in a historical context. Larkin says, “I typically shoot with one camera body, one lens, and a few rolls of film. I had ten frames per roll so I carefully considered each shot. I can have a relationship with my subject, uninhibited by screens.” Larkin tells the story of life on the tailings, which pose a serious health threat to “Joburgers” in a city still trying to recover from an already toxic history.

Today’s white South Africans and the nearby suburbs of Johannesburg they occupy are conspicuously absent from Larkin’s edit, which sticks strictly to the topography of the city’s tailings and the communities living alongside them. Johannesburg is built on one of the world’s largest deposits of gold, discovered under farmland in Witwatersrand, a long, north-facing scarp in the Gauteng Province of South Africa, 130 years ago. At that time, numerous gold rushes all over the globe caused large migrations of miners, including an enormous influx of Africans, to the Witwatersrand area. Well before apartheid, black African workers were kept in quarters close to the mines and the growing dumpsites around them in order to segregate the workers from the colonialists. Larkin maintains, “The system of apartheid helped keep mining costs cheap. That legacy is unavoidable here. In Johannesburg, the people living in poor, informal communities are black. I wanted to highlight this social dynamic by photographing life on the dumps.”

The astronomical amount of gold mined over the past century allowed South Africa to become the world’s largest producer. When gold prices plummeted, the larger mining companies began to abandon their operations and environmental obligations.⁴ Larkin states, “Johannesburg exists today solely because of mining. While most towns built around intense mining go bust when the mining stops, Johannesburg became powerful and rich as a financial center with the mechanics of a proper economy. However, one still cannot take gold mining out of the labor issues and land rights issues of today; the historic legacy of mining in South Africa is massive.” This overpowering history is articulated in

3
J. D. Bold, Dictionary, Grammar and Phrase-Book of Fanagalo (Kitchen Kafir): The Lingua Franca of Southern Africa as Spoken in the Union of South Africa, the Rhodesias, Portuguese East Africa, Nyasaland, Belgian Congo, etc. (South Africa: Central News Agency, 1958).

4
Charles H. Feinstein, An Economic History of South Africa: Conquest, Discrimination, and Development (New York: Cambridge University Press, 2005), 210-211.



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images like *RDP Housing Riverlea, Johannesburg*, which depicts a row of three small houses dwarfed by a strange, yellow mountain towering behind them. Millions of the country's citizens live in such houses, built on and around billions of tons of toxic waste.

The formal qualities that allow this image to express the dwarfing of the people by the land also make Larkin's work undeniably beautiful. In all of its incarnations, this body of work is stunning, skillfully depicting the everyday life of hundreds of thousands of people living on mountains of gold mining waste. For Larkin, formal beauty is not at odds with social documentation. Larkin explains, "I didn't feel I needed to edit out beauty in order to tell this story. Johannesburg is gorgeous...and this complicates its story in an interesting way."

This tension is unmistakable in *Daniel and His Hunting Dogs, Selby, Johannesburg*, an image depicting noxious dust, finer than sand, hanging suspended in the air around a soot-covered man and his pack of skinny dogs. The dust cannot be contained, and Daniel's experience is one he shares with his neighbors. Larkin states, "The southern suburbs like Soweto get sand from the tailings blown in. It covers everything, and is sure to have an effect on the people living there." The dust and polluted water, both inescapable on the tailings and the surrounding areas, are the most hazardous byproduct of gold mining, making images like *Panning for Gold, Krugersdorp, Johannesburg*, which portrays a man lowering a bowl by hand into an acid-orange lake, all the more visceral. For every ounce of gold recovered, thirty tons of waste is discarded. These gold ore dumps contain heavy metals as well as sulfuric acid, both of which pass into the water. This process, called acid mine drainage, makes the gold mine dumps a potentially long-term hazard. Larkin explains, "No studies have been able to accurately measure the health impact of living here because exposure is low-level but long-term, so the exact risks are unknown."

In addition to individuals illegally panning for gold, Larkin also documented African mining operations as they re-opened mines and re-mined dumps. A recent recovery in gold prices seduced African mining companies into revisiting the tailings in search of new capital. Technological advances have made it possible for miners to extract trace precious metals still left in the dumpsites. Larkin states, "There is latent gold left in these dumps, and now that the price of gold is high, it is economically viable to go back and



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extract what remains. The new mining operations are using the old infrastructure. The pumps are being re-fired, the pipelines are being reused, and the train tracks that once visited the original rock to be crushed now run in reverse. Instead of going from the processing plant to the mine dumps, to get rid of the waste materials, they're running the waste material from the tailings back to the processing plant to extract latent gold. Millions of tons of material is being processed. So, there is a new gold rush in the dumps."

Top Star, Boysens, Johannesburg depicts a large outdoor cinema screen as viewed from across an apocalyptically barren landscape. Larkin explains, "When a mining company decides they want to re-mine in a Johannesburg settlement, they must relocate the residents, which is complicated." A mining company closed this cinema to recover ten million dollars in residual gold left in the dump.⁵

Through official channels, Larkin gained access to large-scale re-mining sites, which are heavily reliant on poisonous chemicals for extraction. In *Breaking Down the Dump, Krugersdorp, Johannesburg*, a worker is depicted using industrial equipment to shoot high-powered liquid into the earth. Larkin clarifies, "This is pressurized water used to break down the dump and turn it into slurry,



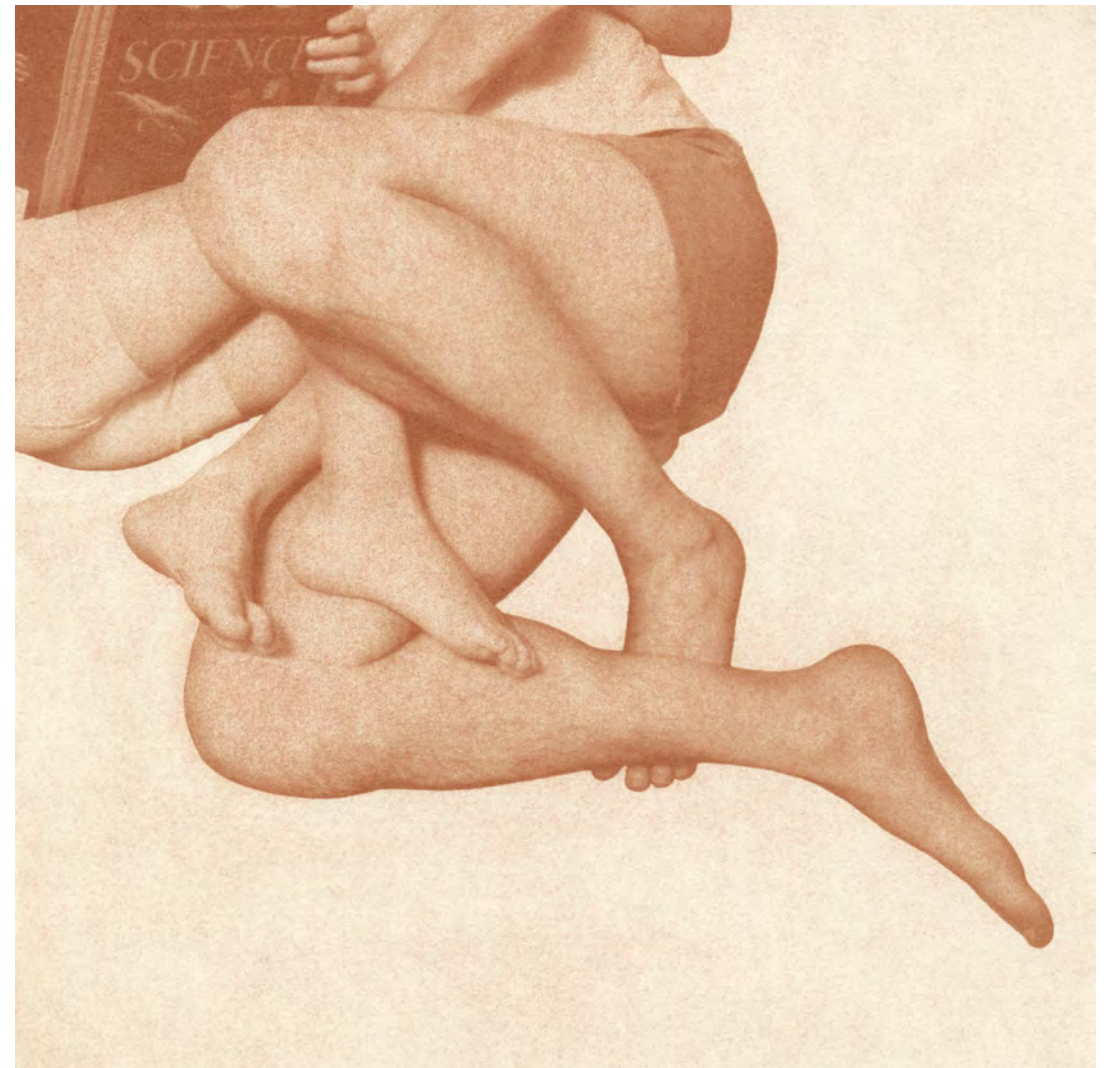
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Ouroboros

Marina



Berio

Central issues in contemporary art can be examined within a broader cultural context by engaging with experts in a range of fields. Consequently, interdisciplinary dialogue is a means to understanding larger themes in an artist’s work. Marina Berio is an artist who combines her own blood with photosensitive materials to create images of her family, harnessing the magical potential of raw materials to communicate through art making. Edward Chen is an environmental engineer and chemist who uses chlorophyll to remove carbon dioxide from the atmosphere and transforms it into useful organic compounds. For this issue, Conveyor editor Liz Sales spoke with Berio and Chen about state changes in matter, the natural overlap between home life and creative practice, and what Greek alchemists called “one is the all,” the interconnectedness of all things.

Liz Sales It seems to me that there is a great deal of overlap in both your themes of interest and methodologies. To begin with, Ed’s scientific practice is highly creative, while your creative practice—which maintains a strong relationship between materials and concepts—calls for an understanding of process well beyond a working knowledge of the darkroom. For example, *Family Matter* is a series of gum bichromate prints made with blood. What does that mean? How is this work actually made?

Marina Berio Gum bichromate is a nineteenth-century process in which watercolors or dry pigments are used in combination with gum arabic and a photosensitive compound to obtain color images. The photosensitive chemistry solidifies gum arabic when exposed to light, and the gum holds whatever colorant has been mixed in with it. I’ve used blood as the pigment in the emulsion instead of conventional artists’ pigments; everything else about the process is the same.

Ed Chen What kind of physical reactions have you noticed using blood instead of the pigment dyes usually used in coloring gum prints?

MB Well, the iron in the blood itself is unstable, causing the print to shift slowly but noticeably from a fresher, reddish brown to a more neutral brown over the course of several months as it oxidizes with exposure to light, humidity, air, and time.

EC So, basically, the prints are rusting. Blood contains—

MB Hemoglobin?

EC Right, hemoglobin. Each molecule of hemoglobin contains an atom of iron at its center. Red and brown are the characteristic colors of rusted iron, and therefore also produce the same colors in blood.

Chemical changes in metals tend to change their colors. This is what makes traditional photography possible; silver halides, the light-sensitive silver salt compound used in conventional photographic negatives and papers, darken in proportion to their exposure to light reflected off a photographic subject.

MB That reminds me of my first darkroom class from a former chemist. In the middle of that very first magical day of development, he told us that the chemistry of black and white photography is basically a chemically accelerated version of the tarnishing of your grandma’s silver, and the yellowing of paper and of apples, and that it’s a slowed down version of what happens when paper burns. He also mentioned the rusting of iron. So, photographic chemistry has always been linked in my consciousness with fire, silver, and other types of changes of state that have associative meanings.

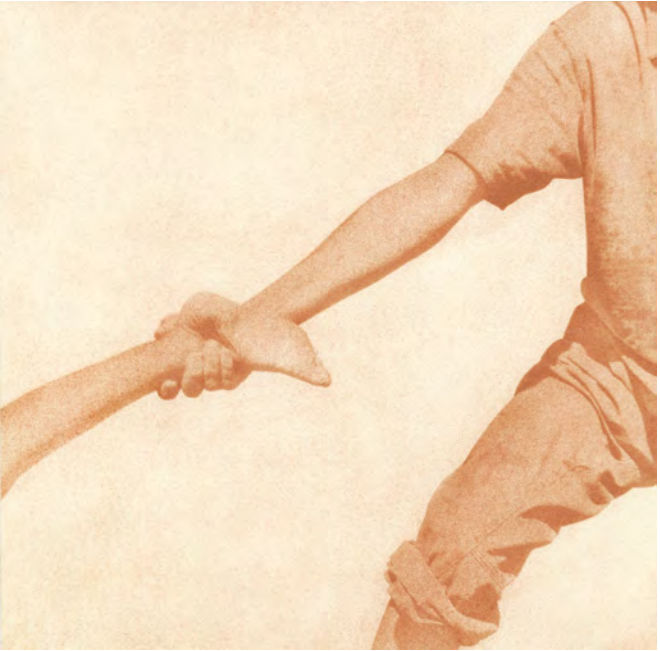
LS I associate Ed’s work with these types of changes of state as well. For example, I read that he has developed “an electro-catalytic process of converting carbon gases, directly from air, into liquid fuels.”

MB Sounds like you’re trying to save the world! Thank you. Do you think the solutions exist, and all we (and by that I mean humankind) need to do is solve production problems like those of economies of scale and transport?

EC Exactly. This technology enables a low-cost method of extracting carbon dioxide from the air, creating nitrogen from that captured air, and combining it with hydrogen to make ammonia, which does not create greenhouse gas upon combustion. Basically, we have the technology to make fuel from air now and run cars off of it.

LS That feels alchemical to me, as if you are performing a modern form of transmutation.

EC Transmutation, turning mercury to gold, can actually be accomplished scientifically. Real gold has been synthesized from mercury by neutron bombardment, but it was radioactive. Types of transmutation happen in nature as well. One element can turn into another through radioactive decay; uranium decays into radium.



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MB Chemistry has always been about cracking the code, hasn’t it? Do you see your work as revealing truths that already exist, even if the forms have not been found yet?

EC Yes. However, I have my own way of cracking those codes. In addition to reading legitimate scientific articles, full of boring data and technical details, I read ancient alchemical texts, sometimes in Latin. Many of Isaac Newton’s ideas came from these texts.

LS Oh, that reminds me of August Kekulé, who attributes realizing the structure of benzene to a dream he had about the *ouroboros*, the alchemical symbol for interconnectedness, a snake eating its own tail.

EC Right. I’ve had similar experiences. For me, alchemical concepts are so general while still touching on themes I’m interested in scientifically that I find they act as a mandala, allowing me to process all the technical, left-brained details from a right-brained perspective.

LS Let’s circle back to *Family Matter*. We spoke about how blood functions chemically in the work, and how this is analogous to the photographic process. But blood is key to understanding the content of these images as well.

Family Matter depicts your husband and son play fighting and roughhousing; blood reminds me of the dichotomy between love and violence, as well as family ties. Has creating this work given you insight into your relationship with your husband and son and their relationship with each other?

MB When I first chose to pair blood with this particular imagery, I was thinking of it in reference to family, and not so much to violence. Rather, I was more specifically interested in the types of bonds that are expressed through blood: those of maternity, childbirth, and labor—in both senses of the word—and how those processes bind me to the males in the image.



01 *Family Matter No. 7, 2013*
02 *Family Matter No. 1, 2013*
03 *Family Matter No. 13, 2013*
04 *Family Matter No. 17, 2013*

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And while the dialectic between tenderness and aggression that exists in the images has never led to overt violence, the kind that draws blood, it has led to tears. I have definitely seen more deeply into my husband and son’s relationship through the images: at first, I thought of their sparring as an expression of some timeless oedipal struggle, and of a process of maturation in my son. But after making the prints and discussing them with many people, especially men, I have come to learn that while this is partially true, the images are also very much about my husband and son as individuals. My husband’s relationship with his father is getting played out as well, as are other aspects of his personality.

EC So, nothing is staged?

MB It’s not staged photography. They’ll start fighting and I’ll grab the camera and get what I can get. I started when our son was about eight years old, when there was a huge imbalance of power between him and my husband. So, my son would often end up crying. The emotional frustration of fighting with someone who’s bigger than you would be too much for him.

EC He doesn’t let him win at all?

MB Yes, of course, if you’re a dad, you let your kid pummel you a little bit. But eventually you show who’s who, you know?

EC Fair enough.

MB Now that they’re more evenly matched in strength, he doesn’t burst out in tears. He’s a teenager. And there’s also more tenderness and a sort of humor in the recent images; they’re more likely to be smiling.

LS I see a significant overlap between your home life and practice too, Ed. For example, you and your partner, Tara, are both working heavily with chlorophyll.

EC Well, Tara is an artist and she gets me to use materials and methods I wouldn’t have thought of on my own. She was scanning images of dried chlorophyll, which got me thinking about the plant material as a natural catalyst. This was key in the creation of my aforementioned carbon-dioxide reactor, which mimics photosynthesis.

More broadly, we are both interested in the basic components that make up nature, which we got a chance to speak about, together, at the American Association for the Advancement of Science in Washington, D.C.

LS For me, that talk and exhibition, more than just broadening my understanding of your individual work, underscored the potential our practices have to deepen our relationships. For instance, in *Family Matter*, I see a parallel between a photographer’s life outside the image and a mother’s life, customarily, but not necessarily, outside of family roughhousing. Marina, do you see infusing your blood into this work as a way of engaging in the activity depicted?

MB Yes, it’s my way of saying that a photographer is implicated in the images she creates, even if she is completely outside of the frame, and not engaged in staging the action, and that similarly, a mother is the author of her family.

And, my roles as photographer and mother are, furthermore, closely linked to each other in terms of my capacity to see what is happening around me and think critically about it. A photographer is always implied in the images she makes, and visual experience is always embodied. I am a great disbeliever in photographic objectivity.

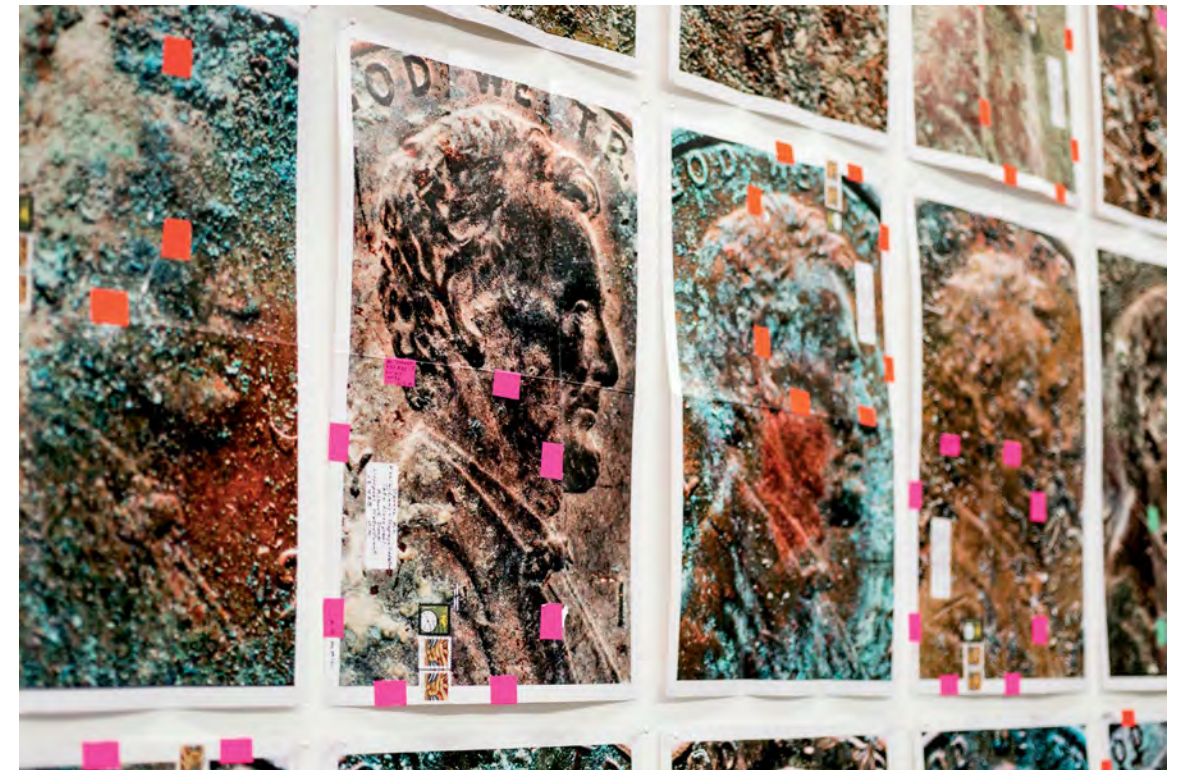
EC I think science is subjective, too, at least in the discovery and invention process. Some scientists box in their thinking in order to be objective, often freezing themselves into an unproductive paradigm. Objectivity is necessary once data needs to be collected, which is what most people associate with “science.” However, the scientists doing the best work are really tinkers.

LS Exactly. I would say experimentation is the lifeblood of any discipline. That’s why I believe interdisciplinary dialogue is so vital; new ideas help us in constructing a more complex understanding of the world. Ancient Greek alchemists studied the arts and the nature of matter, as well as medicine, religion, mathematics, cosmology, and so on. Although all these disciplines evolved into their own fields of study, each can still be more richly understood in relation to the others. ▽

DIVINE
POTENTIAL

OF

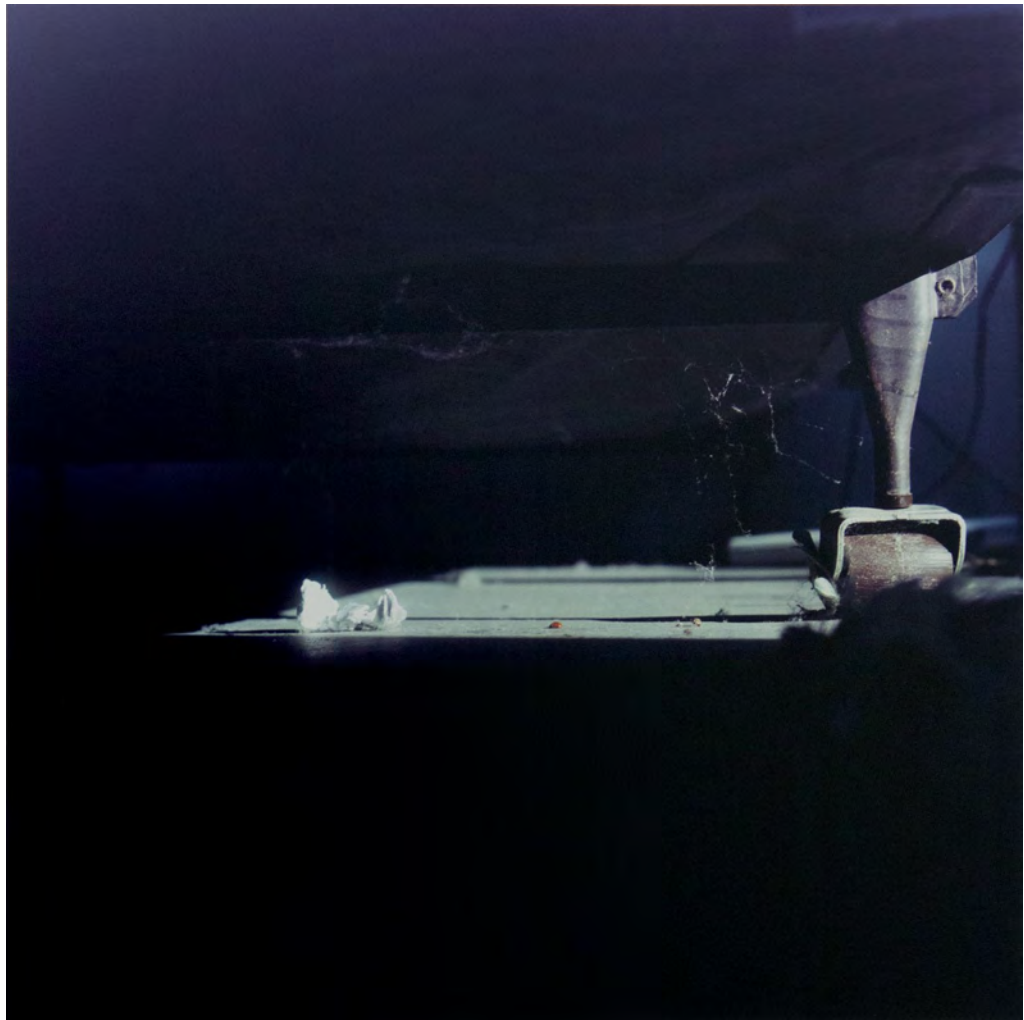
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ORDINARY

DETRITUS

When viewed through an alchemical lens, the work of artist Moyra Davey strongly engages the conceptual and substantial relationship between transmutation and immortality. Her camera transforms the minutiae scattered throughout the everyday, while the physicality of her post-printing process challenges our ideological notion of the photographic print as an eternally fixed object.



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The two basic desires that drove alchemical history, material transmutation and eternal life, are inextricably linked through the Philosopher’s Stone. This substance, which first appeared in a text written in roughly 300 AD by the father of alchemy, Zosimos of Panopolis, is a legendary mixture said to be capable of transmuting base metals into gold. Alchemists did not believe that this material physically resembled a stone but, instead, named it for its essential character. As one mid-seventeenth-century German hermetic aptly wrote in his magnum opus, the Philosopher’s Stone “is called a stone, not because it is like a stone but because of its fixed nature. If we say that its nature is spiritual, it would be no more than the truth; if we described it as corporeal, the expression would be equally correct; for it is subtle, penetrative, glorified, spiritual gold.”¹

Myriad generations of alchemists also sought the Elixir of Life, a tonic thought to prolong human life indefinitely. The Elixir and the Stone, similar in some alchemical texts and indistinguishable in others, were often conflated, linking the quest for immortality and the transmutation of metals. Additionally, associating each of the seven known metals with one of the classical seven planets, alchemists believed that a practitioner who could hasten the ripening of other metals into gold could also master his own astrological fate and become immortal. Alchemical thought sits at the nexus of transformation and transience.

In 1990, Moyra Davey began *Copperheads*—a collection of macro-photographs framing the profile of Abraham Lincoln depicted on US pennies—as an investigation into the psychology of money. “I was reading Freud. The alchemical notion of turning lead into gold found its way into Freud’s writing via folktales and common parlance phrases about turning shit into gold. I discovered I could photograph these totally filthy pennies and really transform them into something both painterly and sculptural.” In summary, Davey uses her lens to perform a type of chrysopoeia, capturing the unique decay of each bas-relief image on each penny’s surface and transforming it into a meditation on the life of the object, with a meaningful and enduring place in the constellation of her greater body of work.

Davey’s practice, which includes interrelated photography, film, and video, as well as reading and writing, is empowered by the transformative examination of everyday minutiae. She has given old newspapers, used buttons, and gathered dust new life, somehow unsentimentally. Though her enormous body of work



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in its entirety may be compared to transmuted gold, *Copperheads* goes beyond the familiar metaphor. Davey explains, “I started making these images in 1990, when I was working as an artist’s assistant and had no money. It wasn’t until I had my first show at Murray Guy in 2009 that they started to sell. Then, I began to see them as my own form of counterfeit.” In other words, each print within the series figuratively raises the value of a one-cent coin, a wry twist on the notion of photography as alchemy.

Photography also has a well-established relationship to ephemerality. Paradoxically, by freezing time, photographs remind us of its unending advance. Davey explains, “People often ask me about my relationship to time passing, but [mine] is just like anyone else’s; it’s slipping through my fingers.” While all photography is adept at underlining time, these images seem to identify photographic qualities in objects and technologies outside the medium; her copious images of clocks and gravesites echo the twilight state of analog photography itself. She continues, “I have a stereoscopic photograph of a graveyard: the words spelled out on a metal arch at the entrance read, ‘We are all passing away.’ That spells it out for me.”

Arthur Edward Waite, The Hermetic Museum, restored and enlarged: most faithfully instructing all disciples of the Sopho-Spagyric art how that greatest and truest medicine of the philosopher's stone may be found and held (York Beach, ME: Samuel Weiser, 1991), 461-462.

Liz Sales is cataloged as a bibliographic item with International Center of Photography Library. A bibliographic item can be any information entity, e.g. books, realia, cartographic materials, or in Liz's case, Liz.

The connection between Davey's subject matter and her use of film extends to her mail-art process. Her first mail-art piece was an 11" x 17" exhibition poster—a screen-grab from her video, *Fifty Minutes*, folded and mailed unpackaged to John Goodwin at Goodwater Gallery in 2007. She fully embraced this strategy as a regular part of her process while living in Paris the following year. She sent prints to New York for an exhibition at Murray Guy, liberating herself from the white-gloved ritual of framing, crating, and shipping art. "Physicality makes this approach appealing," Davey explains.

I was trained to believe a mark or ding on the surface of a photograph ruined it, but these photographs become objects that record the passage of time in space with marks, traces, and bits of colored tape. My body goes into folding each one in half and then down to letter size. I tape and address them, and they go right into the mailbox. Later, they get unfolded, flattened, and pinned directly to the gallery or museum wall. They bear witness to their own manipulation and handling. They're not pristine. They challenge the photograph as an authoritative object.

Last year, Davey combined the aforementioned strategies by taking macro-photographs of Lincoln on US pennies and then sending the subsequent prints through the postal service, creating a series of one hundred new images, *Copperheads 101-200*. The folds and postmarks on these prints amplify the scratches and oxidation on the decaying surfaces of the pennies pictured. Likewise, the indexical nature of Copperheads underscores the photographic qualities in her unique mail-art process. In alchemical terms, this work acknowledges the co-orbital path of transmutation and immortality; these objects are removed from and then returned to time. Her rigorous view of ordinary detritus scattered throughout the everyday reminds us of all we neglect to consider as we move through our daily lives. Moyra Davey challenges us to be more conscious in the present moment by showing us that all matter is aging and collecting dust, that not even a photograph is static. **Ob**



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- 01 *Copperheads 101-200*, 2013, 100 c-prints, tape, postage, ink
- 02 *Floor*, 2003
- 03 *Copperhead No. 48*, 1990
- 04 *Asbes to Asbes*, 12 c-prints, tape, postage, ink, 2012
- 05 *Shure*, 2003

Courtesy of Murray Guy, New York