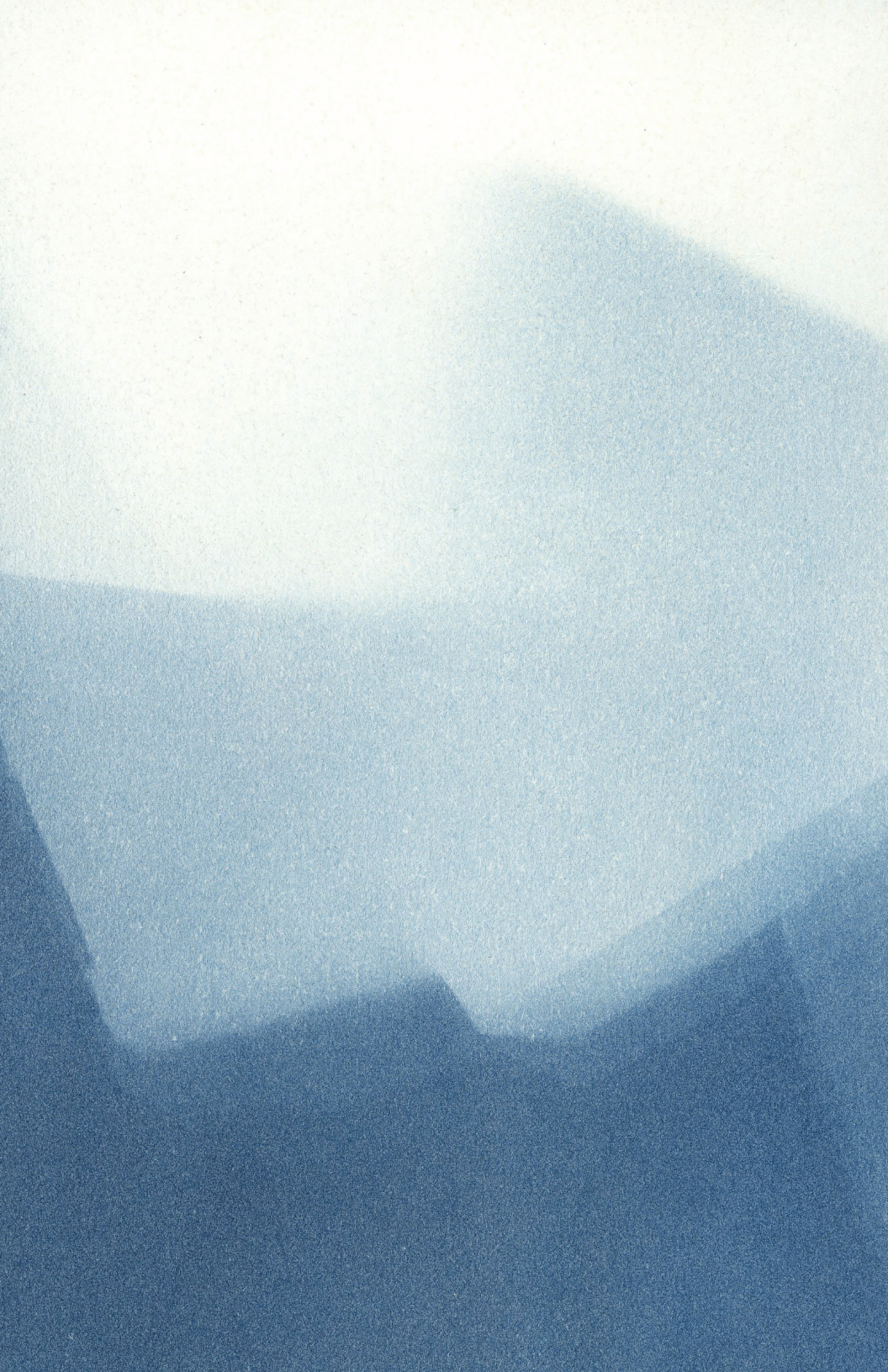


CYANOTYPES: A GUIDE

ANNA ARSCOTT VAN VOORHIS

MIXING

Both chemicals are sold in light-proof containers. Pillowy and green, ferric ammonium citrate wisps out when I crack the lid, sticking with static to my gloves, the scale, the counter. Potassium ferricyanide, gritty and rust-colored, sits more sedately in its canister, a cross between salt and sand.

Each compound must be combined individually with water before using. Regardless of how I mix in the ferric ammonium citrate, it clumps. To remedy this, I pour the clotted mixture back and forth between two beakers until it no longer resembles buttermilk. I make the second solution, that of potassium ferricyanide, half as strong as the first. The two liquids must sit overnight to ensure that the chemicals, particularly the ferric ammonium citrate, dissolve completely.

To make the photosensitive emulsion I add equal volumes of the two solutions together. The result is sensitive to UV light and has an approximate ISO of one. If combined more than a day in advance, however, the two chemicals will conspire and begin a 'dark reaction,' which forms a precipitate of Prussian blue, even without exposure to sunlight.

I am late on an order. The small, dessicated insects sit like reddish pepper in a pile on my workbench. I run through the ingredients list in my head:

Cochineal. Yes.	*Cochenille. Ja.*
Alum. Yes.	*Alaun. Ja.*
Ferrous Sulphate. Yes.	*Eisensulfat. Ja.*
Potash. No.	*Kalium. Nein.*

I cast about for something, anything, to use as a mordant in the red dye I must send out by tomorrow. As I pace my laboratory looking for *Kalium*, I notice you returning from the afternoon meal three stories below. I rush to the open window and yell, *do you have spare potash downstairs? You see I have a shipment of red lake due out tomorrow…*In a lush fur coat, you peer up at me and gesture to your first floor apartments.

I am there before you are.

Though the first floor apartments are well lit, in your laboratory the light is muted by the greasy sheen on the window panes. You stride past me to a far corner from which you drag an opened sack of potash. *Some of this has been used with my animal oil,* you say, *it may be contaminated...*

Contaminated is better than nothing. I hobble upstairs with the weight and set to work. I heat my solution of cochineal and alum, slowly stirring in the ferrous sulphate before taking the mixture off the flames to add the tainted *Kalium*. As I stir the concoction, I look over my shoulder and see the daylight fading quickly.

I glance back to my dye vat. Something's off.

It's not red, it's blue.

After isolating pure prussic acid (HCN), I name the -CN radical cyanogène from the Greek κυανος (*kuanos*), meaning blue, and γενναο (*gennao*), meaning generate.

This nomenclature, owing to my discovery of the compound through the poking and prodding of Prussian blue, ultimately establishes the name for a notorious family of organic compounds: the cyanides.

I spotted a piece of white cloth with a solution of pernitrate of iron, and expose it to the sun. On testing it afterwards with a solution of red prussiate of potash it gave a blue—but no blue before exposure. This is worthy of note. I have not seen it noticed by any chemical writer.

Another day in the laboratory: I run my hand over the worn wood counter where scratches and stains patina the surface with time. The dewy, April morning spills through the window and onto the workbench that was once yours and is now mine. It was here, in this room, that you discovered thermic rays in a blind dance with prisms, mirrors and thermometers.

Your faith in things unseen continues to astound me. It is hard to reconcile your trust with my own yearning for visible evidence. Perhaps this is why I have worked tirelessly *to ensure that your experiments have full ocular demonstration.*

I pull the curtains shut against the new morning and, in the gloom of a single candle, I unwrap the packet of ferrosesquicyanuret of potassium sent to me by Alfred Smee. He passed it along thinking it might be more light sensitive, and thus better suited to photogenic drawings, than the vegetable juices I have been using.

I measure three teaspoons of the compound into a small glass of water and smile inwardly as it dissolves into a swirling, green liquid. I pour a thin layer onto a sheet of paper and wait for it to dry. Once my finger no longer sticks to the solution, I place a small etching on the surface, secure it with a pane of glass and open the curtains. The noon sun streams in and I leave my test in the southerly light before setting out for lunch at Halstead Place.

After the meal, I return and notice that the edges of the coated paper have changed! What was previously light green has turned to royal blue. I remove the print on top and see a ghostly twin. Swiftly, I dunk the coated paper in a water bath, where the blue darkens and loses its chalky pallor. From the water, I transfer the duplicate print to an acid bath, which, as with the plant based dyes, deepens the color even further.

I jot down the following remarks in my notes:

Photography. Photochromy.

Non Argentine, Mineral substances (F3/2CP)

Smee's Red Ferrocyanate of Potash washed on paper gives it a fine pale green colour.

April 23. 1842.

The spectrum thrown on this paper acts slowly but about as fast as on Guiacum When the paper is thrown onto water the impression becomes stronger, loses its Violet ruddiness & turns to a fine prussian blue.

a wash of very dilute acid immediately developed a strong blue impression, having the above character.

This paper will prove valuable.

Try other metallo-cyanates of Bases.

SIZING

In order to identify the planes that make up my kitchen chair I loosely wrap it in butcher paper: a sheet for the front legs and seat, one for the side and another for the back. After securing the paper with masking tape, I rub a slim block of graphite across the surfaces. The edges of the wooden form appear as dark streaks, the nails as dusky punctuation marks, and the textured vinyl as weathered herringbone.

After delineating the chair's form with graphite, I gingerly unwrap the rubbings and begin to scan them. The bed of the scanner glows as the lamp slides under the fibrous paper and a patchwork of legs, seat corners and stretchers materialize on the monitor. I stitch the images together to create a 1:1 digital rendering and trace the contours of the chair with vectors.

I feather the edges with paper doll tabs so that eventually the pieces can be seamlessly glued together and still hold their shape. Then I press play. The network of vector lines is translated and a beam of light skates over creamy paper leaving behind smoky edged profiles of the chair.

The camera is a vegetable peeler, shaving off transects of time through which I glimpse slices of my reality. From the patterns of light and dark I extrapolate everything that was happening the moment the shutter was released.

The word that departed your mouth as you stood there with lips barely parted. The person that caught your eye on the other side of the oak tree. The crashing sound that turned your head.

What if there were a surface that could catch all the words that jumped from your tongue that afternoon? A surface that could register your body as it moved to greet your grandmother in the dappled light? Something that reacted to not just your head turning, but to the dish breaking and the clumsy hands that sent it off the counter?

What would an image look like that was muddied with all this other information, these before and after moments? What if I could acquire a cross section of time that you and I could peer into and in which we could see layers of motion, like slowly pooling sap that hardens into amber?

You could see the dust falling, the beetle's sticky steps, the samaras dancing.

Rather than presenting codified versions of the world that operate according to ideological and technological conventions, early cameraless images bridge the discourse between art and science, aesthetics and epistemology, offering explicit and particularized studies of the world taken from the point of view of light. These photographs critically yoke the medium-specificity of photography, defined by chemistry and the action of light, to the solidity and materiality of the object world.

I crawl over on the floor, my powdery hands leaving behind thin smears of color. I crouch down near the baseboard where it meets the trim of the front door. I run my worn fingertips over the door jamb, leaving a line of pigment where the beveled edge of the wood pushes taut against the white paper. My hand catches every two inches as I move it across the floorboards, leaving staccato lines in its wake. The rhythm is like riding a bike on a long wooden pier.

Twenty years of practice are embedded in the casual, counter-clockwise turn of the key, in my homecoming performance. When entering, my left foot habitually rises to skim over the nail head that sometimes snags my sock when I pad out to get the mail. My fingers reach for the light switch as my body crosses the threshold, my hand searching on the wall.

I stoop down at the site of these daily rituals and the lemony pigment I rub into the paper reveals each of these moments in turn, the lock, the nail, the switch. These places catch and define my daily actions, they receive my marks upon them.

When I make contact prints, the substrate's dimensions are one of few compositional tools I have at my disposal. Deciding the size and shape of what to print on is one of the only ways to frame images when working without a lens. I think of it as defining the parameters of the light I want to archive.

Remembered and forgotten, the stories of the house constantly unfold on the wall/screen. They are sculpted in the corporality of architexture, exposed in the marks of duration impressed on materials, inscribed on fragments of used brick, scratched metal, or consumed wood, and, especially, in the non-spaces. They are written in the negative space of architecture, in that lacuna where the British artist Rachel Whiteread works, casting the architectural void of everyday objects, and the vacuum of the domestic space.

In my second year of college I take a foundry class.

Unsure of what to cast, I grab a handful of spoons from my cutlery drawer on the way to class. I press the spoons into the sand, one by one, until there is a neat row of spoon shaped dimples. On the day of the pour, I tip the molten metal over the lip of the ladle into my molds.

What comes out of this is a spoon without its spoon-ness, it has lost the curve inside the spoon.

I realize that I can change things by very simple acts.

SENSITIZING

I tack the irregular shapes to the darkroom wall with masking tape. They create a nice pattern when assembled en masse but it takes some imagination to see how the disparate pieces will fit together to make a paper shell of my kitchen chair.

In the dim red light I measure out 100 mL of both the potassium ferricyanide and ferric ammonium citrate solutions. Once combined, the resulting liquid is dark and murky green under the safety lights. I swirl my hake brush around and then drag it across the silhouette nearest me.

I work methodically across the rows of legs, stiles and cross rails, checking that the solution does not pool in the dimples of the rippling paper. In the reddish haze of the darkroom the pieces look ghostly, underwater green, but when I flip on the lights the paper is a clean, lemony color. I leave the paper overnight in the dark so that I can handle it without the emulsion smearing.

Not every paper is a good candidate for cyanotype printing. It must hold up in a water bath for at least fifteen minutes, but ideally much longer. It should not be buffered (i.e. made acid free), otherwise the sunny surface of the paper will bloom blue or green before exposure and have a pinkish cast once developed. All told, the only way to see if the cyanotypes will print nicely on a substrate is to test it.

You deemed your cyanotype formula unfit for in-camera use. To begin with, the formula was too slow to expediently capture images. But it was the chemistry's unwavering production of negative images that irked you more than the new emulsion's relative insensitivity. Any positive that could be coaxed from the iron based compounds would quickly revert to a negative.

Undeterred by making negative, in-camera prints, and curious to see how long an exposure would actually take, I set about building my own large camera to take cyanotype photos. The final product was a 22" x 30" x 12" plywood box, a portable interior spray painted black with a dollar store magnifying glass for a lens and a coated sheet of paper taped inside as a sensor plate.

I would drag the camera, wrapped in trash bags, to the site I wanted to document and place it so that it would be undisturbed as it languidly made an image. The resulting prints, which took about a week to form, showed a series of white silhouettes on a bruised background with the sun's path captured as a blue-black band.

You and I mark well worn paths over the course of our days: the arc of the kettle from faucet to burner, the sleepy shuffle from bedroom to bathroom, the scuffle of the shoes on, off and on again at the door. The sun too burns a faithful path across the sky, cutting corners in the winter and lazily stretching out its limbs in summer.

I whip up the thin fabric and let it settle slowly over the mattress. After tucking in loose corners, I pull crinkling carbon paper from its envelope and unfurl it like a fragile tarp. I lay the rustling paper over the mattress in three long sheets, lapping them like shingles. I stretch a fitted sheet out over these layers and carry on making the rest of the bed, placing pillows at the head and smoothing down the comforter.

At night there is a soft whispering as we turn in our sleep but the sound is surprisingly unobtrusive and even you sleep uninterrupted. In the morning the papery shingles are torn but our choreography is still marked on the thin fabric underneath: a dark smudge where a fist turned under the pillow, a grey scrape where an errant foot grazed. In this mattress camera, with its sensor plate composed of cotton and carbon, our bodies act like light and our unconscious gestures are recorded in a grayscale of weight and time.

My marginalia consists exclusively of building elevations. Perhaps this is because my father is an architect or perhaps I find peeling back the facades of imagined buildings independently enjoyable.

Whatever the case, I come to the understanding that if he can come home from work with rolled copies of his drawings than he can also come home with one of my own drawings spread out on the speckled, bluish paper.

I hand my father a shaky mess of lines on his way out the door and spend all day picturing the house I designed as a neat, rectilinear rendering. I imagine that, at that very moment, my dad is feeding the wiggling lines of my drawing into a machine. The machine sucks up each mark and bends into a smooth, fluid line before spitting it out onto the new paper, where it snaps into place along an invisible grid.

The blueprint he comes home with though looks nothing like what I imagined, rather it is an exact replica of the wavering lines I handed him earlier. To my disbelief blueprinting is not for perfecting messy architectural schema, but rather for reproducing a 1:1 copy of a drawing, with every scribble and tangled line intact.

In the absence of the mediating instrument of either the camera or the subject, these cameraless photographic studies are truly indexical, bearing the physical form and trace of the object through flat and direct contact between object and paper in the creation of the original negative.

Even though cyanotypes were ill adapted for in-camera exposures, they soon found use in the engineering, architecture and building trades where they provided faithful reproductions of technical drawings. This is how the word blueprint arrived in the English language, signifying plan or template.

Halfway through the last century, however, traditional wet-processed cyanotypes lost their supremacy to their dry-processed, positive-printing cousin, diazo prints. This meant that the lacy network on a deep blue ground was replaced by watery blue lines on a pale sheet.

Eventually laser printing replaced even the diazos and now the only blue that remains is in the name.

SITUATING

I sit cross legged on the floor of my closet, the darkest corner of my apartment, with a stack of yellow, chair-shaped fragments to my left and the thing itself in front of me. Methodically I stick down hundreds of tabs with tape, layering and wrapping the chair in its new skin.

The paper covers all the planes of the chair except the underside of the seat, the four rectangles where the legs meet the floor and the eighth inch edge of the scalloped splat. With the exception of these small lapses, every other nook and crevice is sensitized and ready to record the light that plays over it.

I bring the cocooned chair back into the kitchen and place it in its usual orientation, sandwiched in the tight triangle between the window, the table and the radiator. One corner of the chair back points to the park outside and the other to the bookshelf filled with cookbooks and miscellaneous pots.

Placing the sensitized substrate has the same gravitas as setting up a tripod. I am choosing what to survey and what to image. Depending on where my set my chair I decide what theater the paper is witness to.

With the camera obscura *[t]he world begins to divide into a twin chamber system of visible things: 'Outside' there is the real world of buildings, trees, humans: the world as an infinitely contingent space, and, separated from it is the 'interior' of the dark chamber. Into it tumbles—as if through an eye that is composed of aperture, mirror and lens—everything that the aperture can optically collect. The light materializes in the darkroom as an imprint of the outer world.*

If the house is a camera than the window is an aperture, mediating between two spheres.

By age twelve I have it in my head that I need my own studio space to house my burgeoning artistic output. To this plea my mother responds, *your grandmother made all her work at the kitchen table.*

This feels like the antithesis of noble achievement. Isn't art something separate from the eating, messing and arguing of the kitchen table?

Gender is an effect of how bodies take up objects, which involves how they occupy space by being occupied in one way or another…Bodies are shaped by the work they do on the table, where work involves gendered forms of occupation.

EXPOSING

You and I bought our kitchen table last year at the Savers on University Avenue in Saint Paul for five dollars. The top is round and, along with its base, painted white by a previous owner. The paint appears incompatible with the table's original finish and picking at it quickly yields plasticy wafers.

As I write, I glance across the uneven surface and my eyes land on the top half of a chair: one corner dusky blue and bathed in sunlight and the other tucked towards the wall in shadow, grassy green in color. Over the past few days the chair husk has blushed from light yellow to its current shade.

I don't frequently occupy that particular chair, closest to the window, but I hesitate even more now because of its fragile covering. I also find myself curating how and when I pull the curtains shut, where I put down my grocery bags and how long I rest my feet on the chair. I find myself ranking the patterns of light cast upon the chair and doing my best to mitigate the bad impressions. The chair is recording the theater playing around it, but a selected, conscious version.

I act around this chair the same way I act around a camera—I hold my body tautly and move deliberately. I am aware of being recorded.

Hi… I have sort of a weird question for you. And I'm sure, since you're poison control, that you get all sorts of weird questions all the time. But I just wanted to call and make sure everything's okay. I think I'm okay, but I mostly wanted to check that if something happened I would already be symptomatic… Mhm… Yeah, no, I feel fine right now… Right, so here's what happened: I'm an artist and I'm working on a project right now where I am abstractly recording my daily life onto sheets of fabric coated with cyanotype chemistry. And I was going about my day, ironing some bias tape for a baby blanket for my cousin on my kitchen table, which was coated with unexposed cyanotype chemistry. Yes, cyanotype… Mhm.... Yup, a dried mixture of potassium ferricyanide and ferric ammonium citrate.... Mhm.... Yes, it is the potassium ferricyanide I'm worried about… Yeah, I was reading online that when potassium ferricyanide is heated it can degrade and you can end up with cyanide gas but I couldn't figure out how hot my iron was getting or how hot the potassium ferricyanide needs to get before it becomes cyanide gas… Mhm… Yeah, I noticed that something weird might be happening because the chemistry, which was sort of yellowish to start, became blue under the iron quickly… Mhm. I know, I thought it was weird too… Okay, well if you think I'm fine I'll just take a long walk outside and make sure I don't iron my unexposed cyanotypes again… Yeah, yes, thanks for your help and I hope you have a good day too.

The kitchen table isn't all that different from the laboratory bench. Specifically, my kitchen table isn't far removed from the work table of Diesbach's Berlin. Both surfaces witness our mundane explorations in heat and transformation. His witnesses the discovery of Prussian blue. And today my table holds up two yellowy crescents slowly turning Prussian blue.

I lived in the apartment building for two years. I kept moving units. Sometimes I moved because it was too expensive to have four rooms and a linen closet and only be one person. Sometimes it was because of the yellow I painted on every wall, a color that was orange and green, and that I hated and loved, in turns. Sometimes it was because I needed to staunch the tide of coupons in the mailbox that threatened to sweep me out the front door and out onto twelfth avenue. Somehow though, through a quirk of physics, in each of these last six moves I shared a different wall with you.

The first wall you and I shared was the floor/ceiling, which is to say your floor, my ceiling. I most often heard you shouting at your girlfriend and then forgiving each other over creaking springs.

The second wall you and I shared was the east/west wall, which is to say your east, my west. This was when you and your girlfriend became fitness freaks. You would both make spinach, banana and peanut butter smoothies at 6:00 am and 6:15 am respectively. I would doze between the two mechanized mastications.

The third wall you and I shared was the south/north wall, which is to say your south, my north. At this point I kept dancing by your window, throwing shadows across your kitchen table, while you telecommuted to meetings in Reno.

The fourth wall you and I shared was the west/east wall, which is to say your west, my east. I can't say that I gleaned all that much about you during these few months, perhaps the wall was thicker, or perhaps you slept soundly that spring.

The fifth wall you and I shared was the north/south wall, which is to say your north, my south. This is when you brought home a metallic blue dog. She could not sense me and would walk right by me, even though you would give me a customary nod.

The sixth wall you and I shared was the ceiling/floor, which is to say your ceiling, my floor. By this time I had become a squirrel and spent my days roaming between the studs and masonry. I would often nap curled around the bulb sockets recessed into your ceiling. They were warm most of the time, a fact I attributed to you trying to heat your frigid space with light.

By the time I had lived on every side, each slice of you has been stitched into a neat projection of you, which I knew wasn't the real you, but was kind of a photograph of you.

There have been whispers at the Society that you have been making headway on a project not dissimilar from my own. It appears you also see silver chloride as a possible substance to arrest the elusive pictures inside the camera obscura.

It has been difficult though, for every time I take a coated slip of paper out of the camera obscura I see on the surface what I see in front of me, but then, in a matter of minutes, the image slowly darkens into nothing.

It is the same for the objects I have coated with silver chloride and left around the house. I painted the porcelain ashtray from Contance's father with solution and left it in my study. When I returned the next day the side that faced the window was a sooty grey but the side next to the inkwell was still ecru. The slim pen had even cast a shadow over the ashtray during the exposure, leaving a thin, undarkened band across one side.

But the play of the light and shadows was impermanent. I brought the ashtray back to the laboratory and watched as it slowly became an even grey.

Homer's Greek had no word for blue as you know it, *kuanos* meant something closer to black: the color of Zeus' eyebrows, Hector's hair. The sea itself was *oinops pontos*, what you might call the wine dark sea.

Those same, inky waters buffeted Odysseus for ten years as he travelled home. While he sailed, my fingers bled from an unceasing ritual: weaving by day, picking out the threads by night. The pattern soon turned to instinct. Years later, when it was no longer necessary to fend off suitors with the unfinished cloth, I still dreamt of the rhythm and my fingers flew in my sleep.

WASHING

Three days later, I remove the sun soaked casing. Back on the floor of the closet I peel off flecks of tape and carefully lay the exposed shapes in between sheets of butcher paper for transport back to the darkroom.

Under the red glow of the safety lights I draw a bath in a long, shallow tray and unwrap the rustling packet I brought from home. I slide the slips of paper into the water a few pieces at a time. The shapes sit calmly for a moment and then, as I raise and lower the lip of the tray, a chartreuse cloud blooms from the surfaces. With each agitation more yellow is released and soon the bath is a uniform color throughout.

Once the first bath is saturated I dump it and pour another. The wash cycle repeats until the water runs clear around the prints. Ghostly blue forms materialize in the water. From the steely grey and green shapes that went into the bath, blue and white ones, like abstract Wedgewood china, emerge.

You and I trudge up and over the sedged dunes, our arms full of specimens. The watery November sun and ocean breeze has left our cheeks ruddy. Tendrils of sargassum tangle in our hands and leave trails of salt on our woolen sleeves. The wind whips our hair and threatens to remove our caps as we make our way back to the small coastal hamlet.

Back inside the cottage you lay the newly acquired plants on the kitchen table. With Mary and Brenden's help we soak the seaweed in a bath of fresh water and carefully clean the strands to remove sand and small bits of algae. Once clean, I transfer the tangles into a fresh tub of water. Mary and Brenden pull a thick sheet of paper through the bath to catch the floating clumps. As they pull out the dripping paper, you and I hasten to arrange the dark green curls into pleasing patterns. The new specimen is then set to dry between thick sheets of blotting paper and the process is repeated.

Some months later and back at Halstead Place, you and I are in the garden carefully layering glass and leathery sargassum onto smooth sheets of yellow coated paper. The work must be done quickly or else the white shadows of the seaweed will have a bluish cast in the final print. Once the layers are properly arranged, you and I step back and watch the yellow slowly turn from green to blue to grey.

Once the paper has turned slate, you remove the glass and the wafer of plant and I ferry the paper back into the house. There our hands meet in the deep enamel tub and we rock the print back and forth in the water as the remaining yellow washes out and a white silhouette defines itself on a deep blue ground.

I scramble up the marble steps of the library, eager to see your work after all this time spent thinking about you.

When I first learned your name, I thought that encountering your prints would be both easy and inevitable. But, as weeks of searching turned into months, I realized that I was unlikely to find even the most bedraggled of your prints here.

It was lucky then, that a bookseller told me about a small show of yours at the New York Public Library.

After trekking across Midtown, dashing through the library atrium and pausing to pass through a metal detector, I find myself out of breath and lost. There is no golden thread of Theseus to guide me to your blue pages. Instead I make several wrong turns before I find a small gallery, about the size of a kitchen, off the main foyer.

The space is crowded even though less than twenty people are inside. The visitors move slowly and methodically, clockwise, around the vitrines and soon I am swept up into the slow swell of observation. In the dim light, I read each label and gaze at every print, nodding knowingly, as if witnessing a conversation between old friends.

But as I wind my way through the space, I begin to grow frustrated with the plexiglass that prevents me from touching the prints that you once held. I begin to resent the facsimiles of your letters that bear no indent from your hand. I realize that perhaps I am closer to you when I am here in the dark swishing water over scraps of paper than in the presence of your work.

Prussian blue, or ferric ferrocyanide, contains iron in two states of oxidation: ferric and ferrous.

ferrous iron	=	iron (II)	=	Fe2+
ferric iron	=	iron (III)	=	Fe3+

These states of oxidation arise when iron is chemically combined with other elements and loses two, or three, of its electrons (negatively charged particles) to atoms of the other elements it is combined with.

Ferric ferrocyanide's mixed state of oxidation is directly responsible for its deep hue. As electrons jump unencumbered from the ferrous to the ferric iron they absorb red light, leaving behind the sensation of the complementary color, blue.

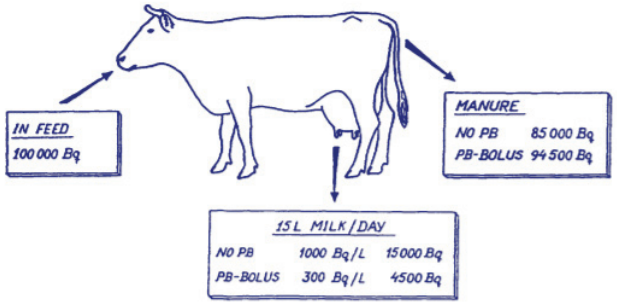
At the molecular level, Prussian blue is an open, airy pavilion. The walls, floor and ceiling are identical and each is framed with delicate chains of ferric and ferrous ions linked to cyanide groups. These molecular buildings, with their open, inviting foyers can accommodate (trap) the ions of heavy metals.

And while the architecture of the Prussian blue is too austere to house the racouness of the kitchen, it cannot help itself but be a sponge.

My hands are the color of midnight from sowing the fields with Prussian blue. This synthetic indigo replacement has proved itself useful for more than sewing. These past few weeks, I have been stitching function back into the hills and valleys, blanketing the dirt, made inedible by Chernobyl, with a pigment that binds cesium, strontium and others so tightly that they climb, inactive, up the food chain.

My kitchen window frames the gentle rise and fall of the Welsh countryside, which is carpeted in a deep, rich blue that renders the rivers that weave across it grey in comparison. Punctuating the slopes, I see herds of livestock grazing on the blue ground, powdery Prussian blue forming a paste at the corners of their lips, dark blue cud staining their teeth.

My window is a blue aperture.



Over twenty irregular shapes of blue and white paper surround me on the floor. Various adhesives, from double sided tape to wood glue, litter the ground as well.

I pick a piece up off the floor: a long, thin curve, with a blue splotch at one end and the sides studded with small tabs. I turn over the paper and put down strips of double sided tape before tacking the shape to a cardboard armature. Once mounted, I press down each of the tabs and secure them with glue. I carry on in this manner until I have stretched each rippled bit of paper over the chair's skeleton.

The chair before me, now cloaked in paper, has a navy top rail with royal blue bleeding down the back and onto the seat until the pigment ends abruptly at a hard, white edge. The chair is covered with moments like these: gentle blue gradients interrupted by angular patches of unexposed paper. The saturation of the blue directly correlates with the intensity of the sun and the colorless patches reference the shadows that lingered in my kitchen.

Although the fields of blue themselves are static, they hold layers of volume and motion. They document the hard edge of the window, the feathered shadows of the tree outside, the path of the sun in the sky, the outline of a body sitting in the afternoon light.

Getting a studio visit with you is an exercise in perseverance, but finally, on the second day of your visit to campus, I secure half an hour of your time.

The images you show of your paper light switches, I-beams, iPhone chargers, radiators, etc. make me certain that my cardboard and paper construction method is lacking. Where your corners are smooth and crisp, mine are a wrinkled meeting of paper edges straining against their cardboard armatures. I fear that the light gradients that have spent three days evolving in my kitchen are not visible behind all the bumps and tears present in my reassembled prints.

In my studio, looking at the three kitchen chairs I have finished assembling, you tell me to do away with the cardboard altogether. *Paper is strong enough on its own,* you say.

I hesitate to move forward this way, constructing the paper records of my kitchen with little to support them. But, I am so frustrated by how much of light's movement is lost to my current building method, that soon the dumpster becomes a graveyard full of cardboard molding, window frames, table legs etc.

To glimpse the days, the weeks, even the months compressed onto a single frame is unfamiliar. I can locate this kind of time outside: in the bands of seaweed gathered in the tidal zone, in the soft autumn leaves layered upon each other. But, to see such sizable parts of my life collapsed onto sheets of paper, is unnerving.

A mixture of potassium ferricyanide and ferric ammonium citrate is only sensitive to violet and ultraviolet light. This means that although I can watch Prussian blue blossom as sunlight washes over the chemistry, a significant portion of what triggers the reaction remains unseen. The chemistry works to literally make the invisible tangible.

When it's all together I'm surprised by how ghostly it feels.

Perhaps it is the faded blue that speaks to some otherworldly existence. Perhaps it is the fragile, shell-like paper that feels ephemeral. Perhaps it is knowing that in order to remove the cabinets, refrigerator, table, windows and molding from the gallery the objects will have to be torn, folded and discarded.

Whatever it is, in some way the paper replica in front of me does not quite capture the banging shut of cabinet doors, the myriad spills upon the counter, the idle conversations at the table.

In some essential way this too is a photograph, a moment, three days, decontextualized and suspended in time.

SOURCES & READING LIST

Ahmed, Sara. *Queer Phenomenology : Orientations, Objects, Others*. Duke University Press, 2008.

Bruno, Giuliana. *Public Intimacy : Architecture and the Visual Arts*. MIT Press, 2007.

Calvino, Italo., and William Weaver. *Invisible Cities*. Harcourt Brace Jovanovich, 1978.

Carpenter, Rhys. *Folk Tale, Fiction and Saga in the Homeric Epics*. University of California Press, 1946.

Coleby, L.J.M. "A History of Prussian Blue." *Annals of Science*, vol. 4, no. 2, 1939, pp. 206–211.

Daniel, Malcom. "William Henry Fox Talbot (1800–1877) and the Invention of Photography." *Metropolitan Museum of Art*, https://www.metmuseum.org/toah/hd/tlbt/hd_tlbt.htm. Accessed 18 Oct 2018.

Finlay, Victoria, and J. Paul Getty Museum. *The Brilliant History of Color in Art*. The J. Paul Getty Museum, 2014.

Hornby, Louise E. "The Cameraless Optic: Anna Atkins and Virginia Woolf." *English Language Notes*, vol. 44, no. 2, 2006, pp. 87–100.

International Atomic Energy Agency. *The use of Prussian Blue to reduce radiocaesium contamination of milk and meat produced on territories affected by the Chernobyl accident*. Vienna, Austria, 1997

July, Miranda. *No One Belongs Here More than You : Stories*. Scribner, 2007.

Lowengard, Sarah. 'Prussian Blue: Transfers and Trials.' *The Materiality of Color: the Production, Circulation, and Application of Dyes and Pigments, 1400-1800*. Eds. Andrea Feeser, Maureen Daly Goggin and Beth Fowkes Tobin. Ashgate, 2012.

Nelson, Maggie. *Bluets*. Wave Books, 2009.

Pallasmaa, Juhani. *The Eyes of the Skin : Architecture and the Senses*. 3rd ed., Wiley, 2012.

Parnell, Edward A. *The Life and Labours of John Mercer..: Including Numerous Recipes Used at the Oakenshaw Calico Print-Works*. Longmans, Green, 1886.

Rebel, Ernst. 'The technical gaze: the parallel world of photography.' *Perspectives on Contemporary Printmaking : Critical Writing since 1986*. Ed. Ruth Pelzer-Montada. Manchester University Press, 2018.

Ricciardi, Anna. "Art & Algae: The Work of Anna Atkins." *Full Stop: Reviews, Interviews, Marginalia,* 21 Oct. 2015, http://www.full-stop.net/2015/10/21/features/essays/anna-ricciardi/art-algae-the-work-of-anna-atkins/. Accessed 15 Oct 2018.

Rose, Julian. "Do Ho Suh." *ArtForum*, 19 Jan. 2017, https://www.artforum.com/interviews/do-ho-suh-discusses-rubbing-loving-66014. Accessed 16 Oct 2018.

Schaaf, Larry J., et al. *Sun Gardens : Victorian Photograms by Anna Atkins*. Aperture, 1985.

Scott, David A., and Gerhard. Eggert. *Iron and Steel in Art : Corrosion, Colorants, Conservation*. Archetype, 2009.

Shapton, Leanne. *Swimming Studies*. Blue Rider Press, 2012.

Stahl, Georg Ernst, and Haude, Ambroise. *Experimenta, Observationes, Animadversiones*. Apud Ambrosium Haude, 1731.

Tate Modern. "Rachel Whiteread in Conversation." *YouTube*, interview of Rachel Whiteread by Ann Gallagher, Tate Modern, 20 November 2017, https://www.youtube.com/watch?time_continue=174&v=WPalyXFpFLE

Ware, Mike. *Cyanotype: The History, Science and Art of Photographic Printing in Prussian Blue*. National Museum of Photography, Film & Television, 1999.

Ware, Mike. "Herschel's Cyanotype: Invention or Discovery?" *History of Photography,* vol. 22, no. 4, 1998, pp. 371–379.