



Image courtesy of the artist

Olle Helin, *Colour Research*, MFA exhibition, 2021. Installation view, KHM2 Gallery, Malmö, 2021

Colour Research

The Phenomenon of Colour

Colour is a broad subject that can be related to a number of different sciences. We can talk about it as a physical phenomenon—about colour as electromagnetic waves that bounce off reflective surfaces, strike our retinas, and are translated into visual information—but then how do we explain the colours we see when we close our eyes? How is it that we can see colour in our dreams? Colour can be both something physical and something psychological. It is a universal phenomenon that the vast majority of organisms can relate to, but at the same time it is extremely individual, because of the different meanings and associations we attach to it.

Many attempts have been made through the ages to provide generalised explanations of colour. In ancient Greece, the philosopher Aristotle understood colour as celestial rays of light sent by God, and during the Enlightenment people instead tried to explain it in mathematical terms. In the beginning of the eighteenth century, the physicist Isaac Newton used prisms to demonstrate that colour is measurable wavelengths of light that make up a spectrum, a system that exists independent of mankind. About a hundred years later, poet and scientist Johann Wolfgang von Goethe offered a critique of Newton's theory by writing his own *Theory of Colours*.¹ In the preface, Goethe compares Newtonian colour theory to an old castle that has been fortified through the ages to finally become uninhabitable.² He asserts, contrary to Newton, that the colours seen by a person after a strike to the eye are just as real as those we can measure as wavelengths of light.³ One branch of "objective" colour theory grew out of Newton's work, with followers such as the chemist Wilhelm Ostwald and the painter and teacher Albert H. Munsell, who each developed mathematical systems to standardise colours. Today we can see how Ostwald's and Munsell's theories are applied in design and architecture, in consumer product design, and in colour schemes for office interiors. Goethe's research is based on human recollections rather than on scientific experiments, and his *Theory of Colours* inspired thinkers like Ludwig Wittgenstein to critically examine colour on a philosophical plane.⁴ Goethe also proposes a subtractive colour model in the shape of a triangle, rather than Newton's

additive colour wheel, which proves to be more useful in the field of art. This branch, which may be referred to as the "subjective" branch of colour, leads to Bauhaus artist Josef Albers's theory, which is perhaps the most interesting of all. He holds that colour is the most relative medium in art: how we perceive it depends on a number of different physical and psychological factors, and how we interpret it varies from one individual to another. So rather than learning others' colour theories, each person ought to construct their own.⁵

In contrast to colour as a phenomenon, colour as an object is quite easy to describe. It is liquids and pigments that change the appearance of the surfaces they are attached to. The description is equally true of an oil painting or of skin tones or of food packaging. Nevertheless, it is obvious that colours fill different functions and have different origins. For example, the black pigment from an ink cartridge is chemically almost identical to the black paint in a Renaissance painting,⁶ but they were produced under completely different conditions. My keen interest in colour led me to the source, and three and a half years ago, I started to make my own paints from scratch. In many ways, this has complicated my understanding of colour, but at the same time it has opened up many new possibilities for me. I will go through some of these in this essay.

Biljetten

I pass by the construction site known as Biljetten in the Sorgenfri district of Malmö a few days after they've moved all the containers and fencing off the site. What's left is a flat gravel area, framed in by pavements and streets in the middle of what is to become a new neighbourhood. The name of the site (meaning "The Ticket") offers clues to its former use as a parking lot for buses, and some physical traces reveal how the site was used before and after that: a reddish-brown gravel surface outlines the shape of the containers that once stood there. A wide, greenish-grey gravel path links together Road A and Road B, and a much narrower desire path has been trampled through the part of the site overgrown with grass. In some places there are piles of abandoned gravel, earth, and crushed gypsum board. Biljetten is a site that has been shaped by industry



Image courtesy of Youngjae Lih

Olle Helin, *Colour Research*, 2021. Detail

and human activity, and on this particular day, I see it as a picture surface, as a gigantic abstract composition. It is a mix of organic forms and straight lines, and no two colours are alike. The infinite potential of the ground washes over me. So I bring some bags with me, along with crates and a spade, and I start to dig. Each type of soil is collected in a separate bag, marked up, and then transported to my studio.

Working in Public Space

I'm an anxious kind of person who doesn't want to cause any trouble. That makes it tough for me to work in the public realm, where the judgemental gaze is ever-present, and because what I'm doing there sometimes conflicts with social norms. I worry about someone scolding me. I get self-conscious in a way that I never am when I'm working in my studio. But the insecurity created by the public eye also offers many advantages. It makes me more aware of the places, the people, and the objects surrounding me. Is this perhaps fundamentally a survival instinct I'm feeling? I recognise this state of mind from when I'm about to give a talk or go into a job interview—when it feels like time slows down. Whatever the cause, I know that in this state of mind I notice everything, because anything could be significant. And often it is some little detail that ultimately leads my work to progress in unanticipated directions.

I can also say that I'm seldom met with animosity; the vast majority of people I meet have positive reactions. These may be parents of small children out for a stroll, someone walking to work, or a child stopping on the way home from school to ask what I'm doing. They ask out of pure curiosity. This turns public space into such a generous place: you get direct access to a wide audience. Not only can they help you find out what's working better or what's working worse in a project, but they can also give you the means to develop it further.

I think most people can relate to the following scenario: You're talking to a friend or an acquaintance, telling them about something extraordinary that happened to you. Your conversation partner then counters with an experience of their own—one that is just a bit more cool, catastrophic, or absurd than the one you just described. This is a tendency I think all people share: we do everything we can to relate anecdotes to our own experiences. If, instead, you bring an unfinished thought or an art project into the conversation, the same principle can be used to give the project more meat on the bone. When I tell someone I meet about my colour research, they might come up with ideas for materials for me to test, suggestions for places for me to visit, or ways of applying the resulting paints. These conversations propel my work onwards, and hopefully they do something for the other person as well.

Working in the Studio

If working in public space is about being in the present moment, about being alert and always prepared for confrontations, then the studio might seem like a place free of risk in comparison. But I think many artists might object to this description. In a drawing, one wrong mark can mean you have to start over from the beginning. An oil painting is generally more forgiving, but can easily turn into a sticky mess if you start making changes. Many sculptural techniques are reductive rather than additive—that is, you carve away rather than add on. As a result, every chip you take away is irreversible. And in a conceptually based practice, the risk of failure lies not at all in the practical execution of the work, but in the thinking behind it: a bad idea gets rejected before it ever gets a chance to see the light of day. Both public space and the studio space carry some risk; that's not what separates them. Where they differ, for me at least, is more in terms of the pace of work. My studio practice revolves around some very tedious processes, so I have to plan ahead rather than make quick decisions. Performing repetitive tasks at a slow pace enables me to think more freely. And I often find meaningful connections between the materials while I'm in the process of organising them.

Making Earth Pigments

After collecting soil samples from the Biljetten site, I filter them with water and a sieve. The finest particles run through, while the larger gravel, sticks, and bits of junk are filtered out by the sieve. I store the filtered liquids in plastic containers and glass jars. A sedimentation process follows, whereby the granules of pigment settle out, and then I empty out the liquid and fill the containers up with new water. Most of the time is taken up by waiting. I repeat the process a couple of times to rinse off the unwanted remnants, and finally filter out the last of the liquid and let the remaining pigment dry out.

Unique Pigments

The procedure can vary a great deal from one material to another when you're making paint. Earth pigments belong to the category of mineral pigments, which are more or less usable as pigments as soon as they're collected (thus the process I just described is not *necessary* to produce a pigment, but is important to improving its quality). By contrast, the production of organic pigments often requires chemical processes in order to extract the sap and then isolate and refine its colour-giving substances. Sometimes



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one and the same material can produce pigments of different hues depending on which processes are used. And often a given pigment can take on dramatically different appearances when used with different binders. Time can also influence the paint's hue, saturation, and transparency. Pigments are incredibly rich in that way. And, thus far, I've only been talking about the pigment's *local colour*. Our perceptions of pigments are further influenced by external factors such as shadows, reflections, and contrast effects, as well as by psychological factors in our reading of them. Josef Albers uses the example that if fifty people are asked to think of the colour "red," they will image fifty different hues.⁷

As an artist, Albers is perhaps best known for his abstract geometric paintings, in which he examines our perception of colour in an almost scientific way, and as an educator he helped mould several generations of artists—during the time he taught at the Bauhaus in Germany and at Black Mountain College and Yale University in the United States, but also through his book *Interaction of Color*, which was first published in 1963. Albers's teaching was about putting practice before theory, and he encouraged his students to form their own understandings of colour through trial and error. He replaced paints with coloured papers so that students would focus on the optical aspects of colour rather than the technical. And yet I think that many of his ideas are equally applicable to material paints. For example, with the earth colours from the Biljetten site, I see how the shipping containers coloured the soil beneath them with their rust. I can see how one gravel road is a cold green and another a warm red. All of the colours come from the same limited area—literally a stone's throw from my studio—but all exhibit unique qualities. In my pigment collection, I have yet to find two colours that are completely identical.

A Limited Palette

Biljetten's colours are brown, perhaps the most useful colour: just as it is said that fertile soil contains all the building blocks of life, brown as an optical colour is a blend of all the primary colours and can "lean" toward yellow, red, green, or blue as no other colour can. For example, just try to imagine a greenish red.⁸ The classically trained painter knows how much can be achieved with a limited palette. On a picture surface, a local colour space is established in which what matters is the colours' internal relationship with one another rather than their verisimilitude. Yellow ochre, terra di sienna, burnt and raw umber, green earth, red earth, and so forth are all sourced from the earth. During the Renaissance, it was common for painters to use earth pigments in their underpaintings. They were and still are very cheap and accessible paints.

For approximately forty-five years, the artist herman de vries⁹ has been collecting earth pigments from around the world. He digs up the soil, collects it in bags, stores the bags in boxes, and later rubs them onto sheets of paper in the shape of squares that together form a grid. His collection amounts to over eight thousand pigments and demonstrates what a broad swath of colours the earth contains—what extraordinary potential lies in the ground. But you don't need to visit a de vries exhibition or see his *Earth Museum*

Catalogue 1978–2015 I–II (2016) to witness this with your own eyes, nor do you have to travel all over the world. All you need to do is go out your front door and bring a spade with you.¹⁰

Artist and curator Carla Zaccagnini often uses a certain metaphor to describe the way she works: she cooks food but she does not bake bread. She shared that metaphor with me during a studio visit in November 2020, and what she means is that she combines various prepared ingredients to put together a meal (or to compose a work of art), whereas someone like me goes back to the raw materials to make something from scratch. Later I came to realise that the comparison between bread baking and making paint works on yet another level: bread can have many varied shapes and tastes, but when you start baking your own, you realise that all its varieties are made up of the same two basic ingredients: flour and water. I came to a similar fundamental insight through the process of making paint: it's actually just a binder (such as linseed oil) mixed together with whatever material you can crush with a mortar and pestle.

Site-Related Paint

My way of working with paint produces a local palette. The pigments become bearers of meaning that contain the unique experiences and the specific places and materials through which they came into being: the geographical area, the societal conditions, the aching muscles the next day, and the conversations with passers-by. They are not site-specific (in situ), since they have been removed from the site. A more applicable term, to which I will return later, might be "non-sites."

The paints I make are the opposite of the paints you can buy in a shop—paints that are mass-produced, commercial products and give the appearance of a homogeneous material intended to be predictable and reliable, revealing nothing of their origins or the conditions in which they were produced apart from the name of the manufacturer. The methods and knowledge I have written about thus far were nothing remarkable to artists in previous eras, when the art of painting was much more of a craft. But a change occurred with the introduction of tube paint. It was invented in 1841 by John Goffe Rand and gave the artist new opportunities. When paint became portable, the artist was able to paint outside. Pierre-Auguste Renoir once said that impressionism would never have occurred if not for the aluminium tube. Above all, artists were liberated from the tedious manufacturing of their own paints. The tube turned paint into a *readymade*.¹¹

The methods used to make one's own paint can seem today like a mystical ritual or alchemy, but in my eyes it is today's readymade paints that are bound up in smoke and mirrors. Their names become increasingly misleading—a good example is lamp black, which might be read as an oxymoron but historically was actually produced by gathering the soot from oil lamps.¹² And there are many other names that are even harder to interpret, such as S 9000-N (NCS) and #231F20 (hex). The mathematical systems to which these names refer may be seen as attempts to create



Image courtesy of Youngjae Lih

Olle Helin, *Colour Charts*, 2020. Aquarelle paper, found pigments, oak frames, 40 x 30 cm each

a universal language for colour, but as a consequence, the ties that bind each colour to reality are cut. Material paint, by comparison, is extremely down to earth, since it is made from readily available ingredients that anyone can combine using simple tools. It is what it is.

City Charts

My interest in the Biljetten site is rooted in the potential I see in the colours of its soil. The composition of the site is interesting—if not necessarily in a visual way, then conceptually. It tells us about how the colours came into being in the encounter between humans and the earth, and I wanted to try to lift that onto a painter's canvas. The surrounding pavements thus became replaced by a stretcher frame, and each pigment was to be painted onto its own delimited surface. I filtered and I ground. For a period of two months,

I transported buckets of water between my studio and the sink. On the actual painting, I spent two weeks. The resulting work is *Biljetten* (2021), a painting that represents the construction site of the same name and is made up of fragments of actual material extracted from it.

For another work, titled *Colour Charts* (started in 2020), I go out into the streets with a set of tools and a predetermined method. The tools are a pad of watercolour paper, a brush, and some water. The size of the pad ranges from A6 to A4: small enough to be held in one hand. I collect the colours I find—gravel from roads, dirt from windowsills, dust, and bird droppings—with my brush and apply them to the paper in the same order I found them. This working method generates a series of colour charts in which random juxtapositions of colour arise, and at the same time

the traces of dirt lead me to the overlooked places where the dirt is collected—to liminal places and routes I could never have foreseen. My wanderings, like *dérives*,¹³ become experimental ways of exploring the city.

Both of these artworks can be described as “charts” in the dual sense of the word: as systematic arrangements of colour, and in the geographical sense as a schematic representation of an area or a route.

Non-sites

In June 1968, the artist Robert Smithson and his friends visited a slate quarry between Bangor and Pen Argyl in Pennsylvania. He experienced that this place dissolved time and the ego, that all boundaries and distinctions lost their meaning in the sea of slate. Before they drove off, he filled a canvas bag with rocks. He transported the material to a gallery space, placed it in thirty-one metal boxes, and called

the work *Non-site #1 (An Indoor Earthwork)* (1968).¹⁴ Smithson made several such non-sites in this way, often including photographs and maps that relate back to the site. A “site” is the raw reality, and a “non-site” an abstract container of it. They may be seen as opposites, and indoors and outdoors should not be able to exist in the same place. But Smithson insists that they can indeed coexist, through a method he calls a “dialectic of site.”¹⁵

I can relate to the events in the slate quarry described by Smithson. My interest in colour goes far back, and it led me to the Falun Mine in Dalarna, Sweden, in December 2017. I wanted to know more about the particular paint they’ve been making there since 1764. On the outskirts of this copper-mining area, I found the untreated raw material: a yellow-brown pile hiding beneath a layer of snow. I filled a paper bag with it and went home. A little while later, I tried firing it at 700°C (as they do in the local paint

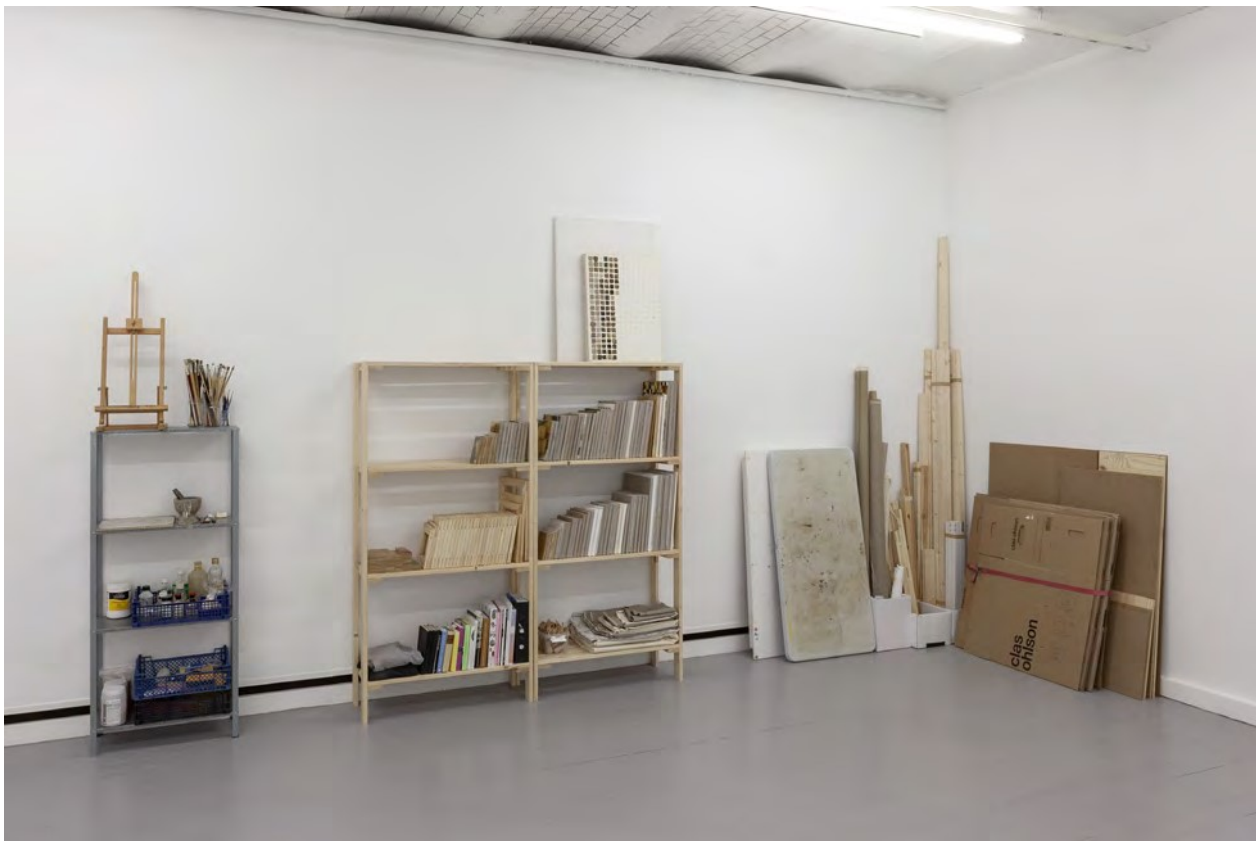


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Image courtesy of the artist

Olle Helin, *Colour Research*, 2021. Detail



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factory, as I learned during my trip), and before my eyes this yellow-brown powder transformed into a brilliant pigment with a warm red colour—as warm as the kiln it came out of. When I left the workshop, I saw pigments wherever I looked in my surroundings: door handles turned to steel and rust, and houses turned into masses of hard-packed ochre; printed letters on paper scattered into a tumult of lamp-black particles; the yellow flowers on the side of the road glowed radiant with luteolin compounds. Smithson calls this phenomenon a “sedimentation of the mind.” The breaking up of these masses reveals the underlying layers of the earth, and you discover the raw materials as they exist prior to being industrially refined.¹⁶ In an interview from 1968, he came even closer to my topic: he says that this search for the raw materials is like tracing a tube of paint back to its source.¹⁷

Smithson’s non-sites are boundless landscapes contained in small fragments of them, and in the same way, kilos of raw material are transformed into a few grams of pigment.

The Pigment Collection

I like the idea of pigments as non-sites, but I don’t believe it’s entirely right to call them that. The subtitle of Smithson’s first non-site is *An Indoor Earthwork*—in other words, it was not an earthwork until it was brought within the walls of the gallery. He also explains that the actual non-site is constituted by both the raw material and its metal container.¹⁸ The pigments are themselves containers of time, material, and place. Sometimes they become a painting, and sometimes I transport them to an exhibition (either as paintings or in their raw form). But most of the time, they exist in my studio. Here I store untreated materials in

bags on shelves, and I have sedimented colours in translucent plastic containers and finished pigments in glass jars in plywood drawers. As my collection grows (lots of material is brought into the studio but very little leaves it for good), I have been forced to develop systems and techniques to be able to navigate these materials. At first it was enough to have simple labels on the jars. But in time I realised that I couldn't keep every method and recipe in my head, so I started entering all studio activity into a logbook. In this way, I can wander back in time, repeating experiments and getting a broader understanding of how things are interrelated. Likewise, historical references and other information that I occasionally need access to could no longer continue to be spread out in notebooks and tagged with bookmarks, so I started collecting them in a zettelkasten.¹⁹ Together they form an ad hoc organisational system, and in the same way the studio is shaped by the demands of the work. Systems are established to create order, but paint and its unpredictable nature demands that those systems be continually renegotiated.

I now want to return to herman de vries and his soil collection in order to offer a better sense of what my own pigments are and what they are not. He and I have in common that we make paints "from scratch"—directly from the raw materials, bypassing industry. Several of my works begin with the formulation of a method, such as the *Colour Charts*, which I described above, or my BFA exhibition *Vandring Genom Staden* (Wandering through the city, Konstfack, Hägersten, 2018), where I decided on a given route between my home and my studio, and then gathered material along the way. de vries bases his work on a method that is simple to formulate: he collects the earth's colours with his hand, and then attaches them in the order they were found, using that same hand, to a piece of paper. But our colour collections differ in that de vries's earth colours end up as works of art framed on a wall in an exhibition, and thus are very close to being non-sites, whereas my own pigments can be considered more like tools. Here I feel a greater kinship with someone like Tina Jonsbu and her colour studies.

Jonsbu is a Norwegian artist who completed her doctorate at the Oslo National Academy of the Arts between 2015 and 2020. As part of her doctoral project, she travelled to the Vormra river in August 2018, equipped with a notepad and a box full of spools of thread in various hues and values. One at a time, she lifted up the spools and held them against specific objects and surfaces. When she found a colour match, she entered it into the notebook and then moved on to the next object. She then uses these notes as the basis for embroideries. The notes determine which thread she should embroider with, and the geographical location determines where in the piece she is to apply it. Slowly, the long, narrow strip of linen becomes filled with different coloured stitches.

To me, de vries is clearly a conceptual artist, while I see my own practice as both conceptual and process based, even if this may seem paradoxical. In one, the idea comes before the execution; in the other, the making is absolutely the most important aspect.

Jonsbu perhaps has a similar relationship to these terms. To me, she is in many ways process based. When she embroiders, the action seems more important than the result. And in her doctoral thesis, she examines the work of the artist as a *production* rather than as a *product*. She also emphasised the importance of process in her 2019 exhibition at Edvard Munch's Ekely, in Oslo, where she displayed works in various stages of her process, from research materials to in-process and completed embroideries. The works were laid out on tables and shelves rather than put on pedestals or hung on walls. But, at the same time, Jonsbu also employs strict rules and structures that seemingly belong to a conceptual tradition, and a chapter in her book *6 texts and pictorial essay in book* (2019) is about one of the foremost conceptual artists, Sol LeWitt. But in this chapter, and throughout the entire book, the focus nevertheless remains on the artistic work rather than on the underlying concept.

Perhaps the combination of conceptual and process-based art creates a paradox—but could it be that it is precisely this paradox that is interesting? We are reminded again of Robert Smithson. He believed that everything is two things that converge: for a *site* to exist, there must also be a *non-site*, and in the clash between them emerges a fantastically speculative space.

A Dialectic of Colour

I can see how colour, like so many other things, contains a number of opposing concepts. Colour is both universal and individual. It is physical waves of light, and at the same time it is something psychological—a material substance with abstract qualities. The contradictions are what make colour so interesting to me, and this interest has led me to go beyond the industrial readymade to arrive at paint as a raw material. But at the same time, my work exists in a post-industrial society—and so another exciting contrast effect arises in the paint.

Raw paint opens up new possibilities. It shifts the focus from product to process. It's about going back to the underlying methods in order to reach fundamental truths. And in the process, a dialogue is established between me and the surrounding world, and it is here that a space opens up in which unexpected things can happen.



Image courtesy of Youngjae Lih

Olle Helin, *Colour Research*, MFA exhibition, 2021. Installation view, KHM2 Gallery, Malmö, 2021

- 1 Johann Wolfgang von Goethe, *Theory of Colours*, trans. Charles Lock Eastlake (London: John Murray, Albemarle Street, 1840; Project Gutenberg, 2015), <http://www.gutenberg.org/files/50572/50572-h/50572-h.htm>.
- 2 Goethe, *Theory of Colours*, xxii.
- 3 “Objects are often seen by sick persons in variegated colours. Boyle relates an instance of a lady, who, after a fall by which an eye was bruised, saw all objects, but especially white objects, glittering in colours, even to an intolerable degree.” Goethe, *Theory of Colours*, 54.
- 4 Ludwig Wittgenstein, *Remarks on Colour / Bemerkungen über die Farben* (Oxford: Blackwell 1977).
- 5 This history of colour is based on several sources. Lots of authors, artists, theoreticians, and historians have dealt with colour. See the Further References list for some of them.
- 6 “Carbon Black,” *Pigments through the Ages*, accessed 7 April 2021, <http://www.webexhibits.org/pigments/indiv/overview/carbonblack.html>.
- 7 Josef Albers, *Interaction of Color*, 50th anniversary ed. (New Haven, CT: Yale University Press, 2013), 3.
- 8 This has long been cited as an example of an “impossible colour,” including by Ludwig Wittgenstein in his *Remarks*. But the fact is that, in a 1983 experiment, engineers Hewitt D. Crane and Thomas P. Piantanida managed to get certain test subjects to see this impossible colour when they looked at red and green stripes through an apparatus made up of mirrors and an eye-tracker device. The apparatus caused the eye to see both colours simultaneously—they blended together to make a new colour that could not be called either red or green. Some of the test subjects reported that several weeks after the experiment they could still recall the colour. See Hewitt D. Crane and Thomas P. Piantanida “On Seeing Reddish Green and Yellowish Blue,” *New Series* 221, no. 4615 (1983): 1078–80, <https://www.jstor.org/stable/1691544>.
- 9 herman de vries writes his name using all lowercase letters to “avoid hierarchies,” as he puts it.
- 10 I don’t mean that de vries always works at a global scale. A piece like *16dm²—an essay* (1975), which critic and curator Cees de Boer considers one of his most important, shows the opposite: here the artist has collected all 473 plants from a 40 x 40 cm grass patch. The samples have all been affixed to their own papers and expanded to form a herbarium that, when framed, covers a wall surface of about 2.1 x 12.8 m. See Cees de Boer, “herman de vries: my poetry is the world,” *Antennae: The Journal of Art and Nature* (Summer 2020): 105.
- 11 Marcel Duchamp (who turned “readymade” into an art term) talks about tube paint in a 1961 interview with radio broadcaster Georges Charbonnier. He says that painting is choosing a tube of paint, choosing a brush, choosing where on the canvas to put the paint, and so forth. It’s the choice that’s the main thing, and the paint and brushes might just as well be exchanged for a readymade—something created in a factory or by another person’s hand. But aren’t tube paints and brushes exactly what Duchamp describes as readymades? In another interview from the same year with art historian Katherine Kuh, he confirms precisely this: “Let’s say you use a tube of paint; you didn’t make it. You bought it and used it as a ready made.” These excerpts are taken from Thierry d Duve, “The Readymade and the Tube of Paint,” *Artforum*, May 1986, <https://www.artforum.com/print/198605/the-readymade-and-the-tube-of-paint-35050>.
- 12 Nicholas Eastaugh et al., *The Pigment Compendium: A Dictionary of Historical Pigments* (Oxford: Butterworth-Heinemann, 2005), 222.
- 13 Guy Debord describes the *dérive* in his “Theory of the Dérive” as a fundamental technique for the Situationists in which, during a limited period of time, one abandons everyday routines and scenes to instead allow oneself to be guided by the gravitational forces of the terrain and the encounters that arise. Guy Debord, “Theory of the Dérive,” *Les Lèvres Nues*, November 1956, Situationist International Online, <https://www.cddc.vt.edu/sionline/si/theory.html>.
- 14 Robert Smithson, “A Sedimentation of the Mind: Earth Projects 1968,” in *The Collected Writings*, ed. Jack Flam (Berkeley: University of California Press, 1996), 110–11.
- 15 Robert Smithson, “Fragments of a Conversation 1969,” in *The Collected Writings*, 187.
- 16 Smithson, “A Sedimentation of the Mind,” 106.
- 17 Robert Smithson, “Fragments of an Interview with P A Patsy Norvell 1968,” in *The Collected Writings*, 192.
- 18 Smithson, “A Sedimentation of the Mind,” 111.
- 19 A zettelkasten is essentially a system of index cards developed by sociologist Niklas Luhmann. Its purpose is to bring together ideas and information, arranged not in chronological order but according to content, and with links that weave together the collection to form a kind of network of knowledge. For more, see Johannes F. K. Schmidt, “Niklas Luhmann’s Card Index: Thinking Tool, Communication Partner, Publication Machine,” in *Forgetting Machines: Knowledge Management Evolution in Early Modern Europe*, ed. Alberto Cevoloni (Boston: Brill, 2016), 287–311.

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