Something in the Air
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"Everything which happens and everything which appears is correlated with orders of differences: differences of level, temperature, pressure, tension, potential, *difference of intensity*."
Gilles Deleuze,
Difference and Repetition

Could there be a more nebulous theme?

Too close and you can't see anything. Too much distance and there's nothing there at all. Cloud is defiant and elusive, refusing to be grasped, reluctant to be distinguished from any other patch of air. It can hang and stretch and swirl around for days, clinging to the hillsides, heavy on the roads, the sky weighed down by water, everything damped down: sounds no longer carry, visibility is low. When it lifts, rising high into thin blue skies, it may disperse and simply fade into the air. Cloud can be great heaps of storm rolling in from the mountains or the coast, piling high above the valleys to form great castles in the sky, those high definition images we know from children's drawings of the clouds—or rather, children's drawings of the sky, in which clouds are put to work, employed to express the presence of sky. They may be obscure and obscuring things, but, in such pictures, clouds let the sky be seen.

Such great billowing storm clouds are legendary sites of myth and prophecy: seats of angels, dragons, gods; sources of visions and unearthly messengers, sliding surfaces like screens on which anything, and nothing much, can play. "Have you ever, when you looked up, seen a cloud like to a centaur, or a panther, or a wolf, or a bull?" The clouds, these "great goddesses for idle men", wrote Aristophanes, "become all things, whatever they please." Look at that one, says Shakespeare's Hamlet: it's almost in the shape of a camel. Or is it a weasel? Or perhaps a whale? Cloud is the realm of lazy, hazy thoughts, flights of fancy, insubstantial musings and imaginings. But those who follow da Vinci's advice to "look into the stains of walls, or the ashes of a fire, or clouds, or mud, or other like spots" may find that it is such *cose confuse*, such indistinct things, that can inspire the "most marvellous inventions" and give rise to the most compelling thoughts—perhaps even about clouds themselves. Or should that be a cloud, or simply cloud? Even on this level, things are far from clear.

It is not just the patterns we perceive in clouds that are unstable and ephemeral: these really are shifting, drifting shapes, fleeting and floating, morphing and mutating, less objects than becomings or propensities; processes rather than events or things. Casting shadow and providing shade, warming the earth and keeping it cool, cloud is a manifestation of the great circulations of water on the earth, part of the constant recycling, the distributive system that keeps the moisture moving round the world. What the clouds reveal of this great cycle are patches of wetness in the air: moist air rises as it cools, sometimes lifted by the momentum of its own falling temperature, or raised by the presence of warm surfaces below, or simply carried on the wind. And as moist vapour cools, it condenses. The air becomes saturated and cloud is formed. If the droplets of moisture which have condensed in the cloud become sufficiently heavy and large, they start falling through themselves as snow or rain. If they warm, they evaporate; the moisture dissipates and the cloud begins to disappear. All this is happening all at once: the presence of a cloud marks the moment—highly contingent, never stable, always susceptible to the slightest changes in temperature, pressure, and movement in the air—in which the moisture droplets manifest their collective tendency to condense or evaporate. Cloud is suspense, suspended.

At different altitudes and temperatures, clouds assume quite different forms. But all cloud makes visible the movements of the air, and it was this that underwrote Masanao Abe's conviction that something of the currents and pressures which produce air turbulence could be learned by studying the ways in which clouds form, remain suspended, dissipate, and break. Clouds can only be observed as they are changing; otherwise there is nothing to be seen. They appear as flux, and this is what they are: sequences of evaporation and condensation, a great process of distillation involving changes in temperature, alterations in pressure, shifts in moisture levels, scatterings and filterings of light, all interacting in a moment that assumes the guise of a cloud, always on the brink of disappearing, always about to dissipate or rain. Goethe compared "the earth and her atmosphere to a great living being perpetually inhaling and exhaling", with clouds and rain being the product of the earth as "she draws the atmosphere to her". Were this to continue, "the earth would be drowned. This the earth does not allow, but exhales again, and sends the watery vapours upwards." A cloud is this moment between wet and dry, moisture poised between the stratosphere and earth, droplets of water or crystals of ice hovering above the land, not quite water, more than air: right on the edge of the visible. The kids have it right in their pictures: clouds are there to let the sky be seen.

Until the early 1800s, clouds were left to drift across the skies quite untouched by anything akin to the Linnaean system which had sorted so much of the natural world into flora, fauna, and minerals, each with their own ranks of orders, genera, and species. It was not until Luke Howard turned what had hitherto been "the useless pursuit of shadows" into a systematic account of clouds as meteorological phenomena that these indistinct forms became distinctive, the ill-defined defined, the apparently infinite variety of cloud formations shepherded into the three broad types that continue to provide the basis of contemporary cloud classification.

Howard's three cloud types were cumulus, stratus, and cirrus—literally heaps, sheets, and locks of hair. Cumulus clouds were characterized as "convex or conical heaps, increasing upward from a horizontal base", the classic well-defined cotton-wool clouds, which often have silver linings too, produced when their cooler edges burn off quickly in the sun.

Stratus clouds tend rather to spread like carpets in the sky, their edges indistinct, overcasting everything in "a widely extended, continuous, horizontal sheet, increasing from below". Cirrus clouds, feathery wisps of cloud often forming at high altitudes, where the air is crisp and cold, were described as "parallel, flexuous, or diverging fibres, extensible in any or all directions." To this basic taxonomy, Howard added nimbus, or rain clouds, and three other variations of his main cloud types. The lenticular clouds which feature in so many of Abe's images of the skies above Mt. Fuji were later named by Clement Ley, in 1894: these flat, lens-shaped formations often appear over mountains and tend to be shaped by the contours of the land (in which case they are known as orographic clouds: ὄρος (oros) is the Greek for hill). Such delicate, translucent clouds form as the rising landscape lifts moist air and can appear as waves in the sky, sometimes streaked with pearly colours as they diffract the light of the sun.

Howard's work may have given European eyes their first chance to distinguish clouds, but there were, of course, other rich vocabularies in play. The Japanese cloud lexicon included *yaekumo*, eightfold or multilayered clouds; *hitsujigumo*, sheep clouds; *ukigumo*, drifting clouds; *nyūdōgumo*, novice monk clouds, as well as the Tsurushi, or hanging cloud, which fascinated Abe, to name but a few; even in Europe, distinctions were made between mackerel skies and mares' tails, for example. Nor was Howard the first to have taken such a systematic approach to the study of clouds: Lamarck's slightly earlier nomenclature, which included such classes of clouds as *en voile, attroupés, pommelés, en balayures,* and *groupés*, was rather more evocative than Howard's Latin terms and Linnaean ranks. These gave his work a winning air of gravity, but the real brilliance of his system was its ability to deal with the mutability of clouds: it could hold them still and stable enough to be distinguished and identified, while at the same time giving an account of how each form was always on the brink of becoming another. His clouds were not things but processes; his work was not simply on clouds but *On the Modification of Clouds.*

It was this emphasis on mutability that made Howard's work so attractive to Goethe, whose enthusiasm for the new classifications of cloud in turn ensured that they had a profound and rapid impact on the arts. As an astute and careful observer of the weather, and with an abiding interest in clouds, Goethe was delighted when Howard's work was translated into German. He had toyed with the idea that clouds were a visible expression of gravitational forces at work in the atmosphere and had long searched for ways to accommodate clouds in his theories of morphological development. But Howard's research sent Goethe leafing back through the weather diaries he had kept for years in order to see how the new system applied to his own observations, and it inspired him to compose a series of poems in honour of Howard and the cloud types he had named.

What Howard had provided was akin to a new lens through which to see the workings of the sky. Poetry had once waxed lyrical about the fantasies evoked by clouds, but poets now became keen to articulate the qualities of clouds themselves. Artists who had previously shown little interest in portraying clouds with any accurate attention to detail now had tools with which to observe and depict them with some care. In Ruskin's view, the old masters had thought of the sky "as a clear, high material dome, the clouds as separate bodies, suspended beneath it, and in consequence, however delicate and exquisitely removed in tone their skies may be, you always look *at* them, not *through* them." The great landscape painters of the early nineteenth century were, on the other hand, willing to attend to the specificity of all phenomena: "Every class of rock, every kind of earth, every form of cloud, must be studied with equal industry, and rendered with equal precision." So it was that landscape painting entered into "the service of the clouds" when it began to focus on the details of landscape, so much of which is sky.

Japanese traditions of landscape art expressed no such desire: clouds are clearly in the service of the scenes portrayed in series of images such as Utagawa Hiroshige's *Thirty-Six Views of Mount Fuji*, the woodblock prints he produced in the 1850s, or Katsushika Hokusai's earlier *Thirty-Six Views of Mount Fuji* and his *One Hundred Views of Mount Fuji*, or even contemporary works which make reference to these sequences, such as Hagiwara Hideo's *Thirty-Six Fujis,* where the mountain—with and without clouds—is placed in a modern urban setting, whose polluted skies mean that Mt. Fuji is hardly ever visible from Tokyo today. Clouds perform clear roles in such images, which resonate with Abe's stills, perhaps obscuring what would otherwise be too much activity in the image, preventing it from seeming too busy by giving it a sense of space, or introducing a sense of movement and instability to a landscape that might otherwise appear too fixed.

But Ruskin's landscape painters were increasingly concerned with accurate portrayals of even the most challenging material. More than any other artist of this time, J. M. W. Turner paid unprecedented attention to light and saw painting itself as primarily a matter of light interacting with moisture, on paper and canvas, as well as in the landscape and the sky. Clouds were precisely this point at which light met liquidity. John Constable was equally taken with the clouds: many of his paintings have meteorological observations jotted on the back, and he too sought to pay the sky the same attention as the land. It was the fidelity with which he worked on his studies of the clouds that generations later invited the German artist Gerhard Lang to photograph the sky from Constable's own doorstep in order to find out if "Constable's clouds are still passing": to see if the forms they now assume continue to resemble those observed in the nineteenth century.

Lang has made other experiments with clouds, using obsolete police identification technology to make identikit clouds, and undertaking a series of "cloud walks" in the countryside and urban settings too, in an effort not simply to look at the clouds, but enter them, capture them, and bring them down to earth. *Cloud Walk 10*, thwarted by bad timing, is described with a sense of contingency that is perhaps not entirely inappropriate to the theme. "Had he been inside the cloud, Lang would have described the situation by filling out a form, recording the temperature, the relative atmospheric humidity and air pressure. His inquiry would have included noting what the cloud felt like, how it tasted, how it sounded, how it smelled and what gender it probably was. He would have finished by using his mouth to suck two litres of the cloud into a glass separatory funnel. After that Lang would have left the roof, taking the two litres of sampled cloud down with him." Lang has exhibited the bottled samples of clouds with which he has returned from earlier, more successful missions.

Lang's collection pays homage to Marcel Duchamp's 1919 ready-made, *Air de Paris*, an empty bottle "full" of air. Karolina Sobecka's project *Thinking Like a Cloud* takes the process one step further: a "cloud collector" gathers clouds not simply to exhibit them but so that they can be ingested, actually swallowed down. This attempt to get inside clouds, and then to get them inside us too, is symptomatic of a new desire to engage with things on their own terms, or at least to ask what these terms may be. Clouds show us certain faces, but what are they for themselves? What kind of thing is a cloud?

We are, of course, ingesting clouds all the time, as we speak, as we breath: the air is always cloudy to some extent, just as the clouds are always more or less fresh air. It is this very ubiquity that makes the clouds so difficult to see, so barely present to our minds, so barely there at all. And so, as Ruskin wrote, the "first and principal thing to be submitted is, that the clouds *are there*. Whether we like them or not, it is a fact that by far the largest spaces of the habitable world are full of them." These great floating phenomena, so slight and effervescent, are a uniquely universal feature of our world: "The noblest scenes of the earth can be seen and known but by few ... but the sky is for all."

Clouds are also always on the move. If the modern world was producing its own new ways to see and record the clouds, in and as their states of change, there was another sense in which the clouds were then in flux: industrialization was transforming them even as Howard was pinning them down. Some of Turner's greatest sunset paintings are said to have been inspired by the polluted skies produced by the eruption of Indonesia's Mount Tambora in 1815, but many other nineteenth century clouds were products of the steam and smoke of industrial revolution, rather than volcanic eruption: soot thrown up into the air, great outpourings from furnaces and factories, smouldering slag heaps, steaming, smoking trains, all the fogs and fumes of the industrial age. Charles Dickens described chimneys which "poured out their plague of smoke, obscured the light, and made foul the melancholy air" in the Black Country, the densely industrialized region of the English Midlands: "a perpetual twilight reigns during the day, and during the night fires on all sides light up the dark landscape with a fiery glow", which found its way into many of Turner's works.

Luke Howard was aware of the extent to which—if not the reasons why—cloud formations and weather patterns are affected by urban development: he identified London's "city fog", which led, as Ruskin later observed, to a city which "loses at least two out of three sunrises, owing to the environing smoke." Climate and industry conspired to make England particularly prone to these fogs, but the effects of industrialization on the skies were visible across much of Europe by the late nineteenth century. "Impressionism" itself emerged from these polluted skies: the smoke that rises from the chimney in the distance of Claude Monet's 1873 *Autumn on the Seine at Argenteuil* shows tainted clouds and polluted tints, and it was because the sunrise in his painting of the Seine at Le Havre was dulled by sea mist and industrial smoke that Monet referred to it as an impression, rather than a view, of the port. Monet's interest in these obscured skies endured. The many hundreds of paintings he made of London's Waterloo Bridge, Charing Cross Bridge, and the Houses of Parliament show these landmarks almost lost to the fogs that coloured and obscured *fin de siècle* London.

With the advent of photography, the first step into what Flusser defined as "the universe of technical images", came a new way of painting with this haze, an unprecedented chance to make still and accurate images of clouds. "It is sometimes possible to draw one cloud out of fifty thousand with something like fidelity before it fades," wrote Ruskin. "But if we want the arrangement of the fifty thousand, they can only be indicated with the rudest lines, and finished from memory." Turner, for example, filled sketchbooks full of frantic drawings made of clouds in his efforts to catch their fleeting forms. No wonder that film and photography seemed made for clouds, sharing their plays of light and shade and finally making it possible to illustrate, compare, and analyse the cloud types Howard had proposed. The advent of photography turned cloud studies into sciences.

Outdoor photography was, however, difficult at first: equipment was heavy and cumbersome, and early developing techniques, using orthochromatic emulsions, did not allow photographs of clouds to come out of the blue, as it were: photographers grappled with the tendency of thinner clouds to disappear in the darkroom, until the development of panchromatic techniques in the 1920s allowed the blue to be filtered out and all the clouds to be captured on photographic plates. The possibilities that then emerged were grasped by many who, like Alfred Stieglitz, saw special connections between photographs and clouds. Stieglitz named the many photographs of clouds he took in the 1920s and 1930s *Equivalents*. They are considered to be the first explicitly abstract photographs, images of light clouds against dark skies, which force an encounter not with the clouds themselves or any other subject of photography but rather with something of photography itself.

It was, however, war not art that drove developments in the representation of clouds. The ability to take photographs from the ground may have put cloud studies on a scientific footing, but flight introduced new opportunities—and reasons too—to record cloud movements from unprecedented angles and with increasing accuracy. Putting cameras in the sky was, according to Virilio, one of the most significant drivers of early aviation: capturing images of enemy territory was crucial to military success—perhaps even more important than capturing the territory itself. And an accurate appreciation of cloud formations, as both states and processes, was in turn vital to aviation too. Never before had the need to understand the currents and pressures of the air been so urgent and immediate.

Commercial aviation has made what had once been the rare mountaintop experience of being above the clouds commonplace. Its planes have changed the cloudscape too, making tracks across the sky, which sometimes disappear as soon as they are formed but often hang around for hours. These contrails collect at the height of cirrus clouds, making dramatic changes to the appearance of the sky, which are nevertheless almost impossible to comprehend until an event like the eruption of the Icelandic volcano Eyjafjallajökull in 2010, which, rather ironically, had a remarkably clarifying effect on the skies above Europe: for the first time in more than fifty years, they were clear and blue for days as dozens of countries banned commercial flights because of concerns that the clouds of dust and ash thrown up by the eruption might interfere with jet engines.

As clouds became increasingly contaminated, a new meteorological condition was defined in the early

twentieth century by Henry Antoine des Voeux, who coined the term "smog", a combination of smoke, sulphur dioxide, and low-lying cloud largely produced by the burning of coal. This was the toxic mixture that plagued London for decades, culminating in the "Great Smog" of 1952, which killed thousands of people in the course of just a few winter days, and giving rise to a new ecological awareness that was not, however, enough to ward off other rapid changes to the nature of the sky: soon to be added to the sulphurous mix were emissions from cars and aeroplanes and, by the late twentieth century, the elements composing smog had been joined by a cocktail of other noxious chemicals. After a hundred years of photography, the play of light on smoky skies that had caught the landscape painters' eye had become a photochemical smog; the dull orange-blue-brown haze now hangs over many of the world's cities, fuelled by forest fires, desert sandstorms, traffic exhaust fumes, industrial outpourings, and all the unprecedented volumes and mixtures of chemical waste and excess that are pumped into the twenty-first-century atmosphere.

Impurities of some sort are, however, indispensable to clouds. Waters are always muddied, and even the cleanest, purest cloud is always soiled: it is this soiling that seeds the clouds, and so makes them possible in the first place. There is something at the heart of every cloud droplet: a hydroscopic speck, attracting moisture, a particle, and so a surface, on which moisture can condense. These tiny specks—aerosols, or condensation nuclei—are hundreds of times smaller than the cloud droplet that collects on it. They are present even in the cleanest air, high up in the mountains or far out at sea. They might be minute particles of soil, swept into the air by the wind, traces of ash thrown up by a volcano or soot from a forest fire, organic compounds released by plants and fungi, elements of salty ocean spray caught up in the wind, even bacteria whipped up from the surface of the earth to play as yet unknown roles in the climate of the earth. The contrails left by aeroplanes, the tracks thrown by ships into the skies above the sea, the great palls of smoke rising from battlefields, factories, foundries, and processing plants, even the most toxic cocktails of chemicals pumped up into the sky—these are new ingredients and multiplications of cloud, but cloud was never fresh, clean air. When the first industrial smokes began to rise into the skies, they were latching onto processes which were already the making of clouds.

Of another order of magnitude were the twentieth century's deliberate contaminations of the air, the wilful production of clouds as weapons of war. In his *Eyewitness Account of Atomic Bomb over Nagasaki*, a member of one of the bomber crews recalls the flight through a cloudy night so stormy that the plane was even hit by dramatic and what must have surely seemed portentous blasts of the electric blue disturbance known as St Elmo's fire, and then the search for a break in the clouds which would allow a target to come into view: "The winds of destiny seemed to favor certain Japanese cities that must remain nameless. We circled about them again and again and found no opening in the thick umbrella of clouds that covered them. Destiny chose Nagasaki as the ultimate target." Less than a minute after the bomb was dropped, a "pillar of purple fire had reached the level of our altitude ... becoming ever more alive as it climbed skyward through the white clouds. It was no longer smoke, or dust, or even a cloud of fire. It was a living thing, a new species of being, born right before our incredulous eyes." And then came the image which marked the twentieth century: a giant mushroom cloud, "seething and boiling in a white fury of creamy foam, sizzling upwards and then descending earthward", a great cloud "struggling in an elemental fury, like a creature in the act of breaking the bonds that held it down."

Abe's skies would never be the same again: the fallout from these bombings poisoned the atmosphere for generations. The mushroom clouds that rose above Japan marked the apotheosis of a long line of military developments which, as Peter Sloterdijk demonstrates, had already begun when "the air totally lost its innocence" with the German gas attacks of World War I—a war which, to echo and counter Walter Benjamin's famous lines, left not even the clouds unchanged. By the time of World War II, the atmosphere itself had been transformed into a theatre of war, so that the most fundamental and necessary act of breathing was turned against itself, making its victims complicit in their poisoning, unable to trust the very air they breathed. René Magritte gave the title *Poison* to his wartime painting of a cloud creeping into a room through a half-open door.

A more devastating weapon than that dropped on Nagasaki in 1945 was hardly conceivable. Post-war military developments instead focused more on systems of surveillance and means of delivery than new contaminants. The next generation of nuclear weapons travelled by guided missile rather than in planes, and instead of airmen peering down from fighter planes, satellites, themselves rocket-launched, became the means by which targets could be identified. When the first weather satellites were put into orbit in the early 1960s, they allowed the clouds to be viewed from far above, revealing an earth veiled by moisture, shrouded in protective and reflective cloud, shimmering with light bouncing off the water in the clouds as well as that in the seas. This glow is known as earthshine, and even throws a low light on the moon.

The presence of Mt. Fuji takes Abe's sequences of photographs far away from Stieglitz's abstract images, which were made on the other side of the world and could have been taken anywhere. But it was obvious to Abe too that the relationship between the camera and the cloud was an extremely special one: both play with light and shadow to render visible phenomena that would otherwise remain unseen. Clouds make shade and shadow, but they display the sunlight they obscure as well, functioning as screens and filters which let the sun be seen as beams and bows and rays: shafts of sunlight, rainbows, and radiant sunsets and sunrises are interactions with moisture in the air which catch and scatter the light of the sun. Clouds are swathes of moisture functioning like screens, variously filtering, scattering, diffracting, and reflecting the light in processes that make them as well as let them be seen.

A cloud is only visible while it is in flux, as it is changing, on the move: this is precisely what makes it a thing, and also what prevents it from being a thing at all. Clouds appear to be stable precisely because they are not at all fixed but rather things of constant movement: "Although it seems to us as though the cloud stands still, the water vapour in the air is in fact showing us the place at which

cloud exists only until the moment in which this vapour, in the form of a water droplet, passes through the cloud."

Abe was well aware that his interest in this ability of clouds to manifest themselves as coherent states had "something to do with my love of film", as he wrote in the 1960s. "Film images show themselves only when the film is running and one image after another is projected onto the screen. And we spectators see what is projected as something that is there and in motion. Isn't that the same thing? It was as this was going through my mind that I began to get more interested in clouds." Whether he presented his images as films, at sixteen frames a second, or laid them out like stills, as though they were time-lapse photographs taken at very long intervals and played back very slowly in the pages of a book, Abe's images were snapshots of clouds, which themselves are snapshots of these processes.

He certainly had time to think about these things, up there in his observatory, perched between the mountain and the city, camera in position, finger on the shutter release, darkroom ready to receive the captured light. Abe belonged to a generation of aristocrats caught between the privileges of an older life "above the clouds", and a post-war settlement that was to see the nobility brought down to earth, the nation defeated and increasingly modernized to suit the Western world. Suspension was the object of his study and the nature of his times.

Abe was neither an artist experimenting with the conventions of style and representation nor a scientist for whom the use of film and photography were simple instruments, means to other ends. He was no amateur but, absorbed in the workings of his own small world—his studio, his mountain, his cameras, his clouds—he conducted his research with a kind of childlike enthusiasm, a tender innocence that situates his *Distribution and Movement of Cloud around Mt. Fuji Studied through Photographs* in relation to works like Hans Arp's cloud-like wooden reliefs, Ugo Rondinone's *Cloud Diary*, or the endeavours of another "watcher on the hills", On Kawara, whose meticulous date paintings are a meditative series of objects, each produced in the space of a day, simply marking time, the passing of "today". Abe offered no conclusions but simply recorded the clouds he saw, waiting to see what they would do, the patterns they would make, the movements of the sky they would reveal, as though he were taking care of them, working in their service, tending and attending to their every whim and fancy, as seems only right: clouds are tendencies, to which one must attend. The many hundreds of photographic plates he made of the skies above, around, and about Mt. Fuji led Abe to raise questions that are written large in clouds but are by no means confined to them: "Are things as they appear, or is that there are no things, and they simply appear to us as things?" To ask, "What kind of a thing is a cloud?" is also to turn the question around: "What kind of a cloud is a thing?"

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