

## Views From The Cloud Chamber

An essay by Rory Prout

This pairing of artworks by Lina Selander and Emma Hartman immediately had me thinking about image-making in the years around 1900. Modernist painterly abstraction has its beginnings in those years before the war and coincided with rapid improvements in camera and printing technologies that made it ever easier to take, process and circulate photographs. The last hundred years of photography has left the world with rich collections of chemically derived pictures, shadows of the world frozen and stored for the future. The twentieth century also exhausted various avenues of painterly abstraction and reduction. The language of abstract painting and the archive of indexical traces are two distinct legacies that Hartman and Selander draw on today. Reflecting on these histories I am also a little surprised to find myself reminded of Charles Wilson, a Scottish physicist who, in 1911, devised a way of seeing (and photographing) traces of subatomic particles for the first time. The story of how he made his discovery is worth retelling here, perhaps with some speculative embellishments. It starts at the top of Ben Nevis, a collapsed volcanic dome that forms the highest point in Scotland.

In an observatory at the mountain's summit scientists monitored weather conditions continuously between 1883 and 1904, and Wilson picked up work there covering the holidays of regular staff. It must have been an inspiring environment for a young atmospheric scientist. Apart from meteorological readings from the observatory itself, Wilson enjoyed rambling the mountain for direct views of the ever changing skies. The peak of Ben Nevis is a large plateau of loose, occasionally snow-covered rock that drops off suddenly in sheer slopes to the north and recedes more gently to views of water and further mountains to the south. On a clear day Wilson could have seen for more than a hundred miles in every direction, even as far as the coast of Antrim, though it is unlikely he could distinguish it from the southern arms of Scotland.

Perhaps he didn't have a single clear day during his brief stay on the mountain, but what he did have was a great variety of cloud formations. Given his altitude, he would often find himself among their mists or could even trek to the edges of northern gullies and look down on them from above. It was from such a position one morning, looking down on a bank of fog with the sky clear above him and with the sun low behind him, that Wilson saw his first mountain spectre. The sun cast his shadow out ahead of him on the clouds, a monstrous figure focused and projected onto false white surfaces. The phenomenon is called a 'Brocken spectre' and it was something he'd enjoyed before, waving his hand to pass its shadow over vast areas in the distance. On this particular morning, however, the clouds rose in an even mist on a far slope and his shadow-figure stood facing him, surrounded by a startling glow of coloured, banded light. With the shadow of his head as its centre point, light shone out like a halo, divided distinctly into the colours of the spectrum. The effect, known also as a 'glory', appeared to Wilson like a beacon lit in the distance, obscured by his magnified silhouette and diffracted into rainbow patterns. Beautiful, and probably

a little unnerving, it gave the appearance of the scientist's giant shadow looking back at him. The concentric rings of light that surrounded his spectre stood out all the more for creating the only colours in that monotone world of early morning fog and stone.

Wilson was captivated, and through his wonderment he already started to draw on his understanding of optical phenomena to account for the effect before him. Perhaps he conjured up images of water droplets redirecting, reflecting and scattering sunlight to form rainbows. He may have pictured his position at that moment, how his line of sight lay directly between the sun and the distant shadow cast by his head. He probably had a rough notion of the angle that light took to escape from behind his head, reach the far mist and be reflected back to his eyes. What he was certainly thinking about was the nature of the cloud vapour that shrouded the spectre in coloured light.

When he came down from the mountain Wilson went into the laboratory and set about recreating the conditions from that morning, in a bid to understand the phenomenon. To do this he built the first cloud chamber, a small, sealed environment saturated with moist air to the brink of condensation. Devising the cloud chamber was a slow process. The chamber was made in glass, to allow for clear observation of events and effects inside it. But it had to be robust enough for very quick changes in pressure. A diaphragm rapidly and repeatedly expanded water vapour in the chamber, controlling the formation of miniature clouds.

By the time he perfected the device, however, he was no longer in pursuit of the spectre and glory from Ben Nevis. While constructing the cloud chamber Wilson discovered a much more exciting phenomenon, one never seen before. He saw tiny clouds form instantly as narrow, directional lines that then fade as their condensed droplets fell out of formation. Occasional streaks of condensation were slashed into the saturated environment of the chamber, clearly marking the passing of some fast, invisible objects. Some would describe a straight line in space while others would change direction erratically. Their appearance was infrequent, ghostly, and heralded one of the greatest breakthroughs of early particle physics.

Wilson had built an apparatus in which charged subatomic particles, like electrons and protons, were able to leave brief, visible traces of their paths. These particles are constantly travelling by and through us, emitted by cosmic radiation. Whenever one passed through Wilson's cloud chamber, through the vapour-laden air, it would leave a trail of condensation in its path. In an instant these objects of theory left physical and visible signs before his eyes.

It is worth speculating on that experience for the young scientist. When he first saw the glory in the mountain clouds, shining back at him from his own distorted figure, it is likely he had already heard or read of the effect. He probably knew he wasn't the first to see it and must have

recognised some optical principle in the rainbow patterns it produced. He was, however, the first to build a cloud chamber, and the first to witness darting wisps of synthesised cloud in the lab, caused by charged pieces of atoms. It must have again been like encountering a spectre, the ghostly traces of an invisible world.

The story of Wilson's cloud chamber has always, for me, seemed to belong to that broad set of early twentieth century achievements – artistic, scientific and industrial – bound up with the nature of ‘vapour’. It can be grouped with paintings by de Chirico and Manet<sup>1</sup>, and with early camera footage of the steam of the railway and the fog of war. I can see in Hartman's and Selander's work an effort akin to Wilson's, just as Wilson was, in his turn, himself involved in processes that were similar to those pursued by certain painters of his era. Frantisek Kupka's progression from figurative painting toward purely abstract, colourist works comes to mind. By means of an artificial device, Wilson re-pictured the natural world, creating an image by reducing a feature of nature to a radically simplified form; in other words, he was engaged in a work of abstraction, with formalist intentions. He was not recreating a copy of the mountain clouds in miniature, but fine tuning the physical characteristics that produced the visual effects – their density, for instance, and the angle and strength of light falling on them. In achieving this he accidentally achieved something quite different: he established suitable conditions for highly illusive objects to leave their indexical marks. Like the light-tight chamber of a camera, the cloud chamber functions through exclusion. It is free of dust, of all particles except water molecules suspended on the point of changing from one state to another. From the first moment of his discovery Wilson's project shifted from the pursuit of the abstract to the manipulation and recording of indexical signs.

This exhibition makes the gallery into a kind of cloud chamber. In the exclusionary space the outcomes of abstract painterly process and the traces of photographic heritages converge. Hartman's formal language is assembled from those fundamental specificities of painting: colour relationships, the division of the plane, the qualities of dividing edges and layers, the behaviour of material, the artist's hand. In her large painting, *Tidal*, the delicacy with which the artist mixes and applies colour, in places seeming to almost dye the canvas, is occasionally overcome by the medium's nature, in drips that carry or remove colour down the painting. An emphasis on colour and material behavior in Hartman's paintings suggest cues from mid century abstract expressionists like Mark Rothko and Morris Louis, while her compositions, the staggered ratios into which Hartman divides colour sections, borrow a certain logic from Richard Diebenkorn. Selander extracts her works from ‘film’ – both film theory and the actual physical stuff of archival footage. The result is a sort of semiotic game. In *The Offspring Resembles the Parent* money is portrayed in terms of its graphic design, the symbol of a specific currency is shown to function through a similar mechanism as the concept of money itself: its meaning relies on established agreements and understanding. Symbolic signs are preceded by the indexical. Footage of Lenin's dead hands, saved in print, is paired with a shot of much older hands traced on a cave wall and frozen there with pigment, like the shadow traced by the Corinthian Maid in the ancient

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<sup>1</sup> See T.J. Clark, *Modernism, Postmodernism and Steam*, in *October*, Spring 2002, No. 100, Pages 154-174

Greek story and which makes an appearance in Selander's second work *Notes for a Film on Nature*. In this work the indexical sign is paramount. The film's images of 'nature', derived from various archives, behave very much like the tiny objects that blew trails of cloud through Wilson's chamber. Though the film is digitally projected, and loses any true physical connection to its referents, there is still something of the index at play here. We are reminded that these documents do exist somewhere, compiled and stored as frozen marks of our world from the last century.

Wilson's story has always fascinated me and in his device I see the unlikely convergence of two of the most important ideas about images from our recent history. Outside the gallery is a sheltered cove with the Celtic Sea beyond, leading eventually to the North Atlantic. We are separated from the weather of the sea by the windowpanes, but the white walls of the gallery act as another type of filter of the world, or of its representations. The works of Selander and Hartman that it now houses have been produced through processes of looking, selecting and preserving. Optical characteristics of land and water are refined and worked onto canvas. Images of nature, once chemically fixed, have been sequenced again, strung together with new associations and retraced in the gallery. The lexicon of abstract painting and the archive of filmic traces that play out in these works make for compelling interactions. Like the cloud chamber, the gallery has become a distilling site where these two kinds of pictures can meet – where the abstract, normally untethered from representation, can be shot through by the indexical, by the most undeniable signs of the physical world.