Traces of/by nature:August Strindberg's photographic experiments of the 1890's

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The following paper centers on August Strindberg's photograms of the 1890's and their relation to an attributed capacity of photography – its apparent ability to capture a picture automatically, without human interference – and the nineteenth century conceptualization of photographic objectivity which followed from this attribution. Strindberg's notions of nature and chance play a crucial role in this relationship and are related to the way in which the photogram can be seen as a medium located between science and art. At the same time, this paper considers the connection between technical innovations like photography and concepts of sensory perception and the extent to which photography shaped the possibilities and limitations attributed to the human senses. In the case of the picture-producing technique "photogram", an aspect of 19 th century photography, the technology revealed hidden or unseen phenomena in the world and was therefore regarded as a kind of substitute to human vision. I argue that the photogram, as a cameraless and lensless variation of photography, had a formative role in the conceptualisation of photography, which thereafter stuck with terms such as "contact", "impression" or "trace" for describing the referential status in photography theory. The photogram's tactile qualities gave it a central role in the science and parascience of the nineteenth century, shaping the so-called medium-specificity of the photogram as an artistic principle.

Pictorial ambiguity

August Strindberg, the Swedish playwright, essayist and novelist, who lived between 1849 and 1912, is as outstanding artist in many respects. In the 1890's he not only devoted himself to the natural sciences (almost ceasing his literary writing entirely), but he also sustained another major interest, in his experimentation with photography.[1] Besides explorations in the field of chemistry, optics and astronomy, he was interested in botany and alchemy. Strindberg's most important writings in the field of natural sciences are his speculative research reports, entitled Antibarbarus (1984), which were published in letter-format and questioned the predominant classification system of the elements; and the more essayistic work Sylva Sylvarum (1896), which challenged the "big disorganization" and the "infinite interrelation" in the world.[2] At the end of his life, he published his four-volume strong Blue Books (Blå Böckerna).[3] These contained short entries often in dialogic form, which examined various fields, such as mathematics, religion, biology, history and photography, and tried to elaborate an overall structure of analogies in the manner of Emanuel Swedenborg's theory of correspondences. Though he did not achieve great professional success with his experimentation, he was, in fact, more interested in the experimentation process itself. He had begun to explore photographic techniques in 1865, a time when amateur photography had not yet been established.

Besides his acquisition of the first available box-camera, invented by George Eastman, Strindberg produced his own cameras consisting of a simple box with an uncut lens or pinhole camera.

In the following text I am not focusing on Strindberg's poetic writings, but entirely on his photographic – or, more precisely, on his photogramatic – work of the 1890's. This makes it possible to take a close look at the specific possibilities of the photogram, its connection to photography and the powers it was attributed with as a result.



Figure 1: August Strindberg, Photogram of Crystallisation, c. 1892-1896, 12 x 9 cm, The Royal Library, National Library of Sweden, Stockholm.

lights, and the result is necessarily but a very imperfect picture of the object.

Diffused light, especially that of a dark winter's day, and during a snow storm, is not fit for this kind of photo-micro-



Figure 2: Walter E. Woodbury, Photographic Amusements, Boston 1922, 9th edition.

I am particularly concentrating on two groups of photograms, both produced without a camera or lens – a choice which reflects Strindberg's mistrust in the photographic apparatus, which led to a certain distortion and aberration in his view. The first example, shown in figure 1, is one of six photograms made between 1892 and 1896 in which a "drawing" of an almost-white structure on a light brownish background emerges. In the lower part of the picture, two holes and a square-edged contour rupture the almost unvarying horizontal lines. In the upper part, irregular but mostly vertical lines graduate into shorter ones, cut off by a bigger, wave-like line at the border of the picture. Somehow this picture is reminiscent of natural forms: the structure in the lower part, for example, is reminiscent of the intersection of earth, with the upper part suggestive of wildly growing plants. But what is there actually to see? What has left its imprint on the photographic surface?

From his writings and letters we know that Strindberg used saline solutions on glass plates, which crystallized when exposed to heat or cold. After this, he impressed the result directly onto photographic paper. Photogramatic experiments like this are inspired by hoar frost and ice-ferns, a popular subject at that time which Strindberg himself noted in several passages.[4] In a letter to Per Hasselberg of 1892, he wrote: "I have returned to my crystal aggregates which I photograph directly by printing straight from the glass slides on which the crystallization has been carried out. And these aggregates – frost-flowers – have opened up perspectives into nature's secret places that have astounded me."[5]

Experiments with crystallization, for scientific research or for the simple amusements of producing "very delicate photographic images", were described in various contemporaneous articles.[6] This topic was a part of the scientific popularization movement of the nineteenth century, seen, for example, in the photographic amateur book Photographischer Zeitvertreib by Hermann Schnauss (first published in 1890), or in Walter E. Woodbury's Photographic Amusements of 1896, which describes "the many beautiful phenomena of nature that can be studied by the aid of photography" (figure 2). [7] The interesting thing in describing snow and ice crystal photographs as photographic amusement lies in its potential to generate pictures inspiring human imagination to see concrete forms, which can be clarified with Woodbury's diction of these phenomena as "natural phenomenon in ice", "delicate lace-like edging" and "floral design".[8] The importance of photography's ability to picture snow and frost patterns lies in the fact that these patterns can be transformed from their ephemeral state - in which they would quickly evaporate and disappear – into a fixed state. On the other hand, photography's attributed potential to reveal an authentic image of the object – one which the naked eye looking through the microscope would interpret, in this case, as symmetrical and regular forms – exposes asymmetric or imperfect shapes in the photographic picture. This changed perspective, coupled with photography's so-called "mechanical objectivity", generates a different set of assumptions concerning the nature of snow crystals.[9]

For Strindberg the fascinating fact in his photograms were the crystal formations reminding him of living matter. Influenced by his interest in the occult, the pictorial ambiguity of the crystals as they metamorphose into forms of plants, water, earth formations and so forth, was suggestive and belonged to his imagination to see similarities in real things.[10] According to Strindberg, these crystallizations arose from the crystal's remembrance or resurrection of its ancient form. He therefore asks if it could be possible that water, running through animate and inanimate things many times, remembers earlier stages of living and dead matter in its crystalline formation.[11]



Figure 3: August Strindberg, Ein Blaubuch. Die Synthese meines Lebens (A Blue Book), 1st tome, German Edition, Munich 1920.



Figure 4: Friedlieb Ferdinand Runge, Der Bildungstrieb der Stoffe. Veranschaulicht in selbständig gewachsenen Bildern, Oranienburg 1855.

This belief in the "image-making instinct"[12] of nature is reflected in a short notice in his *Blue Book*, entitled "Reincarnation", in which Strindberg describes nature's potential to generate similarities in organic or inorganic forms, such as the crystallized acidity of a vine resembling vine leaves or the rebirth of a checkered-lily seen in its crystallized ash (figure 3).[13] Another aspect of nature's image-making instinct is the apprehension of forms in natural objects, transforming an ordinary thing into a natural picture. This was something which occupied Strindberg when he worked in Upper Austria, where a rock is generally known as "Turk's head": a photograph of this rock, which he collected in his

"green bag" (*Gröna säcken*), is still preserved in the Royal Library in Stockholm.[<u>14</u>] I think that this searching for meaning or relevance in nature, in its creations, and in the surrounding world can be, on the hand, interpreted as evidence of a belief in supernatural occurrences, inspired by a need to explain and unravel everything in nature, and, on the other hand, connected to romantic *Naturphilosophie*.

Reproducing nature – The photogram as second nature

In his analysis of Strindberg's paintings, the art historian Douglas Feuk notes that, because Strindberg believed that nature could generate pictures of itself, he saw his pictures not as representations of nature, but as a part of nature. Therefore his pictures can be identified in their actual process of the pictorial production as a parallel action to nature.[15] In his paintings Strindberg tried to cast the color over the canvas randomly, the visual sense somehow controlled the pictorial production. In the case of his crystallization photograms, he goes one step further, by leaving the glass plate completely untouched: the material of the saline solutions determines the formation of the picture and so its actual emergence is not controlled by the artist's and is therefore an autopoetical production of chance. This can be compared to the chemist Friedlieb Ferdinand Runge and his autopoietical pictures of the 1850's: the production of these pictures likewise stands between science and art, involving a chemical method of analysis (paper chromatography) which produces images of "aesthetic beauty" explicitly addressed to artists (figure 4).[16] In this context, Runge discusses his theory of a so-called Bildungstrieb der Materie (a term he adopted from Johann Friedrich Blumenbach's 1781 publication, Über den Bildungstrieb und das Zeugungsgeschäfte), the self-acting power of generating forms and shapes, which is therefore comparable to the life-force of plants and animals.^[17] These examples are important in this context as Strindberg explicitly refers to a concept of a self-generating power which can shape pictures somehow automatically or without a tangible author. [18] This autopoetical aspect gives rise to the idea that they can be understood as natural creations.

The direct imprinting process of Strindberg's crystallizations from a glass plate to photographic paper – the self-acting transformation of the outer world into an image through contact – is reminiscent of William Henry Fox Talbot's so-called "photogenic drawings". Talbot was one of the inventors of photography, and described his invention in his book, *The Pencil of Nature* (published between 1844 and 46), as a kind of better method of drawing compared to the hand of the artist, in which subjectivity can influence the process of "copying" a natural object.[19] As Talbot identifies his photogenic drawings as "specimens" or "items", it is clear that these pictures were considered to be, as the art historian Carol Armstrong has pointed out, "a natural art as well as a natural thing, something made by nature as well as a piece of nature".[20] This idea of photograms as natural things, and the valuation of the process by which they are produced as natural, can be associated with Strindberg's picture process, which I want to clarify via a discussion of the second group of photograms.

Imagining the sky

In the colored photogram, made by August Strindberg in 1894, an overall structure of yellow-golden dots seem to emerge from a brownish surface, with their largest conglomeration visible in the upper part of the picture (figure 5). On the upper right edge, these dots are concentrated into a bigger, spotty area on a bluish background. Another concentration is found in the lower part, also surrounded by a bluish fog. A hint towards how this might be interpreted is given by Strindberg's title of the photogram: "Celestography". In 1893, when he moved to Dornach in Upper-Austria, Strindberg produced about 16 of such photograms. These were produced by placing them directly in a basin filled with developing liquid and leaving them under the night sky.[21]



Figure 5: August Strindberg, Celestography, 1894, 12 x 9 cm, The Royal Library, National Library of Sweden, Stockholm.



Figure 6: August Strindberg, Underlandet (Wonderland), 1894, Oil on canvas, 73 x 53 cm, National Museum, Stockholm

It is not quite clear in how Strindberg wanted these pictures to be perceived, but, as he entitled them "sky photographs" and even sent them to Camille Flammarion (a famous French astronomer) for observation, it is reasonable to argue that Strindberg considered them to be actual inscriptions of the night sky. He concludes: "To know where I stand, I am sending pictures to the Société astronomique de France accompanied by a report."[22] Even if Flammarion himself was devoted to occultism and frequently attended mediumistic sessions, he did not pay much attention to Strindberg's pictures. In fact, Flammarion presented Strindberg's Celestographies to the members of the Société astronomique de France, but the transcript of the conference held in May 1894 includes only a brief reference to the work: "Mister J. Strindberg, Austria, sends photographic prints, made without a lens."[23] The pictures were then returned to Strindberg. The scientific quality of his photograms and their usability in scientific research were not, however, Strindberg's primary interest. He instead put an emphasis on the actual

production process. From his experiments with a pinhole camera to his experiments with the photogram technique, a certain distrust in the resulting image of lens and camerabased photography can be seen. "Today, in these days of x-rays, the miracle was that neither a camera nor a lens was used. For me this means a great opportunity to demonstrate the real circumstances by means of my photographs made without a camera and lens, recording the firmament in early spring 1894."[24] The crucial phrase here is the concept of "real circumstances", which do not speak to the eve, but to the photogram. In his view, human vision could not be trusted. What the human eye can see is uncertain; what the photographic plate makes visible is the true condition of the surrounding world. It can be argued, therefore, that the photogram can reveal things or conditions which the naked eye is not able to see – or which it sees in a different way.[25] For Strindberg, it is not the mediating camera but the photographic plate that is the medium best able to reveal the world-out-there. On 26 December 1893, Strindberg declared in a letter to Bengt Lidforss, a physiologist: "I have worked like a devil and have traced the movements of the moon and the real appearance of the firmament on a laid-out photographic plate, independent from our misleading eye. I have done this without a camera and without a lens. [...] The photographic plate showed an area full of moons. Certainly, every spot on the photographic plate reflects a moon. The camera misleads as the eye does and the tube hoaxes the astronomers!"[26]

Elsewhere he writes: "If I remove the lens in the dark chamber, the effect of the rays must be stronger once freed from the work of passing through a medium such as glass."[27] For Strindberg, this direct impression of rays or objects was another method of recording the surroundings - even a better kind of recording. This can be understood as a critique of the visually and technically mediated perception of his time, and one that led him to photogramatic experiments to resolve the question of "how the world presents itself independent from my treacherous eye".[28] As he leaves the apparatus and the lens aside in his celestographical work, he moves from the inscription of the object onto the photographic plate via direct contact to an inscription which he perceived as a reflective mirror.[29] Photograms are seen to have created another manifestation of the moon and the stars, leading him to the following remark: "Considerations. - Why do the stars and the moon not present themselves as they appear in the mirror, in clear and defined forms? It must be the eye and its construction, which decides over the forms of those luminous discs. Sun and moon are not round?"[30] For Strindberg it is not quite clear, if those forms revealed by the photographic plate unveil the "right" image of the firmament, or rather another kind of form, one leaving an open question to be solved by the scientists of the Société astronomique de France.

What the photogram actually enables is, on the one hand, an automatic inscription and, on the other hand, creations and manipulations from direct contact with objects – something which cannot be achieved with other forms of photography. If one looks at a photograph one does not only see the material thing as such – the picture – but is able to "look through it", like a window, to the thing that once stood in front of the camera, revealed in perfect perspective. The photogram, in contrast, does not only show the imprint of things in two-dimensional abstraction, but also its own materiality.

Between science and art

In 1839, when photography was invented, a new scientific ideal emerged that almost displaced the "truth-to-nature" model of scientific drawing, called "mechanical objectivity", in Lorraine Daston and Peter Galison's terminology.[31] This ideal is guaranteed by the mechanical elements of photography, the apparatus, which is able to deliver pictures without the interference of human beings. Even if photograms do not use such a mechanical apparatus, my argument is that the photogram is situated between mechanical objectivity and free creation. It is connected with the notion of mechanical objectivity because it belonged to the main category of "photography" - which, during the nineteenth century, implied various photographic techniques like x-rays, which were also produced without a camera, and could therefore be understood to have revealed a true and objective image. As it does not have the mechanical aspect, the photogram can be used for free creation and abstraction by means of direct interference. This makes the photogram a perfect medium for Strindberg's approach, which was itself situated between science and art: "Photography, being a scientific experiment for a long time, has now become a game, but nevertheless the whole operation is a mystery."[32] Thus, Strindberg, as an artist, took up a scientific medium which he analyzed with art-based research methods, which means that his photograms can be described as art that understands itself as research.[33] He did not necessarily want to achieve a new scientific discovery, but he was rather interested in a playful engagement – an artistic exploration of the technical possibilities. Strindberg was not only working *with* the photogram, but *on* the photogram. That is, his celestographies are at the same time a pictorial product of observation and the object of observation.

Imitating nature's way of creation

In his celestographies Strindberg did not try to imprint an object directly through contact, as was generally the case with photograms; instead, he left the photographic plate completely on its own. As Talbot put it, "it is not the artist who makes the picture, but the picture which makes itself"; photographs, as well as photograms, are defined as authorless techniques generating pictures automatically.[34] This can be directly related to Strindberg's concept of picture production in which a great part of the actual formation of the work develops out of his control. This interest in chance productions as an artistic method can be traced back to an article Strindberg entitled "Des arts nouveaux! Ou le hasard dans la production artistique," published in the French journal Revue des Revues in November 1894.[35] There he speaks about the potential of chance in the aesthetics of artistic production as an important factor in imagination and inspiration, as well as in how the artwork is received by the viewer. The final sentence – "The art to come (and go like all the rest): To imitate nature more or less; and especially, to imitate nature's way of creation!" – is essential to his work. His appeal to modern artists was not to work after nature in a mimetic sense, but to work more like nature. This shows that Strindberg regarded the imitation of nature's production process as the crucial part of artistic work. If this statement is transferred to his photogramatic work, it signifies that Strindberg did not only want to imitate a natural process by leaving the photographic plate on its own recalling Talbot's notion of a self-acting medium generating pictures automatically, but

that he also wanted to transfer his photograms to a natural state as pictorial surrogates or simulacra. This aspect becomes even clearer in light of the fact that Strindberg did not fix his celestographies, which means that they actually transformed and changed their appearance over time. Even now, it is not quite clear which status of the images Strindberg would have seen himself when he examined his sky photograms.

The Aristotelian credo of nature creating forms, *natura naturata*, and the related concept of *natura naturans*, which means that the artist produces artifacts equal to nature's, led to the idea of the artist as creator, or second god, which has endured since the sixteenth century. I think, therefore, Strindberg's desire to "imitate nature's way of creation" is connected with romantic philosophy's conception of nature. In this, the genius of the artist was emphasized, as the actor who creates without imitating nature but yet is analogous to nature. An astonishingly similar passage can be found in August Wilhelm Schlegel's Berlin lectures on aesthetics of 1801 and 1802. In these, he defines nature as object and model of observation for the artist: "Art is to imitate nature. This means, art like nature, should be independently creative, organized and organizing, forming living works."[36]

The second thing I want to point out is the role of the imagination in Strindberg's aesthetics of production. The basic idea is that nature is perceived to generate its own pictures seen as images of chance, for example in the appearance of stones reminiscent of faces, patterns in marble resembling real objects, clouds taking the form of animals and so on. Leonardo da Vinci is said to have been the first to formulate the potential of incidental images as a method of creation in his unfinished "Trattato della pintura". The important passage from this work states: "I shall not fail to include among these precepts a new discovery, an aid to reflection, which, although it seems a small thing and almost laughable, nevertheless is very useful in stimulating the mind to various discoveries. This is: look at walls splashed with a number of stains or stones of various mixed colors. If you have to invent some scene, you can see there resemblances to a number of landscapes, adorned in various ways with mountains, rivers, rocks, trees, plains, wide valleys and hills." [37]

Thus it was that Strindberg's imitation of nature led him in his photographic experiments to work with the photogram as an artistic medium, to explore its material form and the imaginative processes it generated. In his photogramatic work, the impact of chance and the role of the spectator in the actual genesis of the artwork – or in the genesis of "potential images" – are comparable to the paintings he worked on from 1892 onwards (figure 6). By using a knife to distribute the color randomly on the canvas, and by trying to imagine forms or objects within it – a series of rapidly changing impressions, changing from a sea to a wood to a pool with a rose, as described in his text on chance – he is more or less a bystander in the creation of the artwork and is deeply connected to the ambiguity of the picture. This process can be compared to theories of automatism and chance developed by the avantgarde movement, such as the "écriture automatique", developed by Surrealist artists – a comparison which cast Strindberg as an ancestor of modernism.[<u>38</u>] The analysis of his photograms is more complex than that of his paintings insofar as photography, generally speaking, is related to reality and truth because of its intrinsic

constraints of inscription. To quote the photo historian Peter Geimer, "its special status seems to derive less from the photographic end product than from the process of its production."[39] You cannot look at a photograph or a photogram, therefore, without asking what there is actually to be seen. What referents can be identified as having left their trace on the sensitive surface? If I were to argue that Strindberg's celestographs are paintings and, as their title mentions, are to be understood as representations of the sky, the analysis would be taken in another direction. Thus, the question concerns the "realityeffect": in photograms, this means a production or reproduction through an automatic inscription and contrastingly in painting a representation through mimetic imitation. This reality-effect produced in - or claimed to be produced in - photograms can be seen to have an indexical relationship with a real referent. This indexical relationship is generally described as an impression or trace in photography theory and initially derives from the description of the photogram, relating to its intimacy and contiguity with the natural referent that has produced it. In the special case of Strindberg's celestographies, I want to use the term "trace" and not the term "impression". Whereas an impression, like a fingerprint given for identification purposes, refers to something left in awareness of its bodily registration in or on a surface, a trace, like a footprint, is left unintentionally or unknowingly. Sybille Krämer writes in her book Spur. Spurenlesen als Orientierungstechnik und Wissenskunst: "The materiality of the trace - unlike the sign is not subordinate to representation. Traces do not represent, but present."[40]

At the same time, traces are polysemous, which means that they cannot clearly be identified, whereas something with only one meaning would be termed a sign. We need, therefore, to interpret traces in order to make them into an identifiable sign for a formerly present, real referent. In Strindberg's case, the interpretation of traces drawn on the photographic surface is revealed by the title's he gave to them: Celestography. What we have to see in these formless traces is the night sky. This can be called the indexical relation of photographs or photograms. On the other hand, it can also be argued that the inscriptions on the photographic surface belong to the effects of chemical reactions and therefore do not represent pictures of nature. Rather, they can be seen to be artifacts.

Conclusion

August Strindberg's first photograms can be regarded as impressions made temporally, *after* a "natural process" in keeping with Talbot's photogenic drawings, as a transfer to a fixed pictorial status. In contrast, his celestographies are pictures *of* an inscription process, in which the materiality of the photographic plate generates a perpetual transforming picture. Related to this, the trace can be seen as an important concept for analysis: on the one hand, it refers to the indexical relationship between photography and its referent, and, on the other hand, it prevents a concrete identification. This can be summarized by Sybille Krämer's description of the "epistemiological double life of the trace".[41] In general, photography is said to have an indexical relationship with a real referent, and the capability of making, for example, invisible things visible. Following this line of thinking, traces on the photographic plate must show something. At the same time, however, *something* unidentifiable has left its trace on the photographic surface;

something has caused a vague, ambiguous and indifferent picture. This polysemous trace cannot be assigned to any approved knowledge. In order to become concrete, it needs the active participation of the beholder's imagination.

To understand Strindberg's celestographies negatively, as aesthetic productions made by accident or incident - which is what Peter Geimer, in his recently published book, Bilder aus Versehen, has proclaimed – is to misinterpret Strindberg's creativity as an artist and curious scientist who did not consciously refer to the "internal dynamics of the photochemical ingredients",[42] but conducted a vision or view of his own. The "pictorial incident" in Strindberg's photogramatic pictures to which Geimer refers, can be identified by us as modern viewers because we are aware of the possibilities as well as the limitations of photographs and photograms. Therefore, Strindberg's picture production via the medium of the photogram is not only a pictorial manifestation of his way of thinking in analogies and the aesthetic procedure of chance, but also an investigation of the photogram, of human perception and a comparative study of the sense of sight and optical devices. But - and this is the main argument against an assessment of Strindberg as an artist consciously using the "aesthetics of the incident"[43] - the celestographies refer to the mimetic documentation capacity of photography and its potential to represent a real object, however abstract their appearance might be. Strindberg's photograms can therefore be seen as an essential step towards modernity - towards a disentanglement and an emancipation from mimetic theories of representation, a conscious reference to the "internal dynamics of the photochemical ingredients" and a new theory of perception, all expressed in the avant-garde movement of the 1920's onwards.

Notes:

1. Cf. Bernd Stiegler, Bilder des Realen. August Strindberg und die Photographie, in: Montagen des Realen. Photographie als Reflexionsmedium und Kulturtechnik, München 2009, p. 127-151; Fechner-Smarlsly, "Die Welt für sich und die Welt für uns." August Strindbergs Celestografien, in: Bildwelten des Wissens. Kunsthistorisches Jahrbuch für Bildkritik, 5/2, 2007, p. 29-39; David Campany, Art, science and speculation: August Strindberg's photographics, in: Olle Granath (ed.), August Strindberg. Painter, Photographer, Writer, exhibition catalogue, London 2005, p. 113-119; Thomas Fechner-Smarsly, Die Alchemie des Zufalls. August Strindbergs Versuche zwischen Literatur, Kunst und Naturwissenschaft, in: Henning Schmidgen (ed.), Kultur im Experiment, Berlin 2004, p. 147-169, p. 391-394; Bernd Stiegler, August Strindbergs Theorie der Photographie. Versuch einer Rekonstruktion, in: Walter Baumgartner/Thomas Fechner-Smarsly (ed.), August Strindberg. Der Dichter und die Medien, München 2003, p. 211-235; Douglas Feuk, Dreaming Materialized. On August Strindberg's photographic experiments, in: Per Hedström (ed.), Strindberg. Painter and Photographer, exhibition catalogue, New Haven 2001, p. 117-129; Thomas Fechner-Smarsly, Der Künstler als Medium. Zu August Strindbergs Auseinandersetzung mit Malerei, Fotografie und Naturwissenschaft, in: August Strindberg, Verwirrte Sinneseindrücke. Schriften zu Malerei, Fotografie und Naturwissenschaften, ed. by id., Amsterdam/Dresden 1998; Douglas Feuk, August Strindberg, peintre et photographe, in: Suzanne Pagé et al. (ed.), Lumière du monde, lumière du ciel, exhibition catalogue, Paris 1998; Douglas Feuk,

August Strindberg, in: Okkultismus und Avantgarde. Von Munch bis Mondrian, Frankfurt a. Main 1995, p. 132-135; Michel Frizot, L'âme, au fond. L'activité photographique de Munch et Strindberg, in: Lumière du monde, p. 193-198; Clément Chéroux, L' expérience photographique d'August Strindberg. Du naturalisme au sur-naturalisme, Arles 1994; Douglas Feuk, Strindberg: Paradiesbilder – Infernomalerei, Hellerup 1991; Per Hemmingsson, August Strindberg som fotograf, Åhus 1989; Ture Rangström, Photogenie – Photogenique. August Strindberg und die Photographie, in: Angelika Gundelach (ed.), Der andere Strindberg. Materialien zu Malerei, Photographie und Theaterpraxis, Frankfurt a. Main 1981, p. 247-290.

<u>2.</u> August Strindberg, Antibarbarus I oder die Welt für sich und die Welt für mich, Berlin
 1894; Id., Sylva Sylvarum (1896), in: Natur-Trilogie, ed. by Emil Schering, München 1921,
 p. 173-332

<u>3.</u> August Strindberg, Ein Blaubuch. Die Synthese meines Lebens, ed. by Emil Schering, vol.1, München 1920.

<u>4.</u> August Strindberg, Sylva Sylvarum. Das Seufzen der Steine, in: Emil Schering (ed.), August Strindberg, Natur-Trilogie, München 1921, p. 237-268; id., Neue Kunstformen! Oder der Zufall im künstlerischen Schaffen, in: Verwirrte Sinneseindrücke, p. 30-38, 35f, 138; Cf.: Gustav Hellmann, Schneekrystalle: Beobachtungen und Studien, Berlin 1893; Lorraine Daston/Peter Galison, Objektivität, Frankfurt a. Main 2007, p. 156ff.

5<u>.</u> Michael Robinson (ed.), Strindberg's letters, vol. 1, 1862-1892, London 1992, p. 366-368, 367.

<u>6.</u> Anonymus, Crystallisationsdruck, in: Photographisches Archiv, 9, 167/168, 1868, p. 348.

<u>7.</u> Walter E. Woodbury, Photographic Amusements, including a description of a number of novel effects obtainable with the camera, New York 1896, p.73ff; Hermann Schnauss, Photographischer Zeitvertreib, Leipzig 1890, (4th ed. p.17ff); Cf.: Herbert Molderings, Laszlo Moholy-Nagy und die Neuerfindung des Fotogramms, in: id., Die Moderne der Fotografie, Hamburg 2008, p. 45-70; Clément Chéroux, Les récréations photographiques. Un répertoire de formes pour les avant-gardes, in: Études photographiques, vol. 5, 1998, p. 73-96.

<u>8.</u> Woodbury 1896, pp. 75, 78.

<u>9.</u> Daston/Galison 2007.

10. Eva-Maria Siegel, Okkultismus und Avantgarde, intermedial. Bemerkungen zum Werk August Strindbergs um die Jahrhundertwende, in: Hartmut Kircher/Maria Klanska/Erich KLeinschmidt, Avantgarden in Ost und West. Literatur, Musik und Bildende Kunst um 1900, Köln 2002, p. 271-295. For ambiguity as aesthetic paradigm in art: Verena Krieger et al. (ed.), Ambiguität in der Kunst. Typen und Funktionen eines ästhetischen Paradigmas, Köln 2010. 11. Strindberg, Sylva Sylvarum, p. 244ff.

<u>12.</u> Feuk 2001, p. 123.

13. Strindberg, Ein Blaubuch, p. 380.

<u>14.</u> August Strindberg, Inferno, in: Ann-Charlotte Gavel Adams (ed.), August Strindbergs Samlade Verk, 37, Stockholm 1994, p. 206. Quoted after: Dario Gamboni, "Dieses Schillern der Eindrücke freute mich…". August Strindberg und unabsichtliche Bilder im Paris der 1890er Jahre, in: Gerhart von Graevenitz/Stefan Rieger/Felix Thürlemann (ed.), Die Unvermeidlichkeit der Bilder, Tübingen 2001, p. 173-186, 179.

<u>15.</u> Feuk 1991, p. 28. Concerning the term ,second nature' compare: Norbert Rath, Zweite Natur. Konzepte einer Vermittlung von Natur und Kultur in Anthropologie und Ästhetik um 1800, Berlin 1996.

16. Friedlieb Ferdinand Runge, Zur Farbenchemie. Musterbilder für freunde des Schönen und zum Gebrauch für Zeichner, Maler, Verzierer und Zeugdrucker. Dargestellt durch chemische Wechselwirkung, Berlin 1850; Id., Der Bildungstrieb der Stoffe.
Veranschaulicht in selbständig gewachsenen Bildern, Oranienburg 1855. Cf.: Friedrich Weltzien, Vom Bildungstrieb der Stoffe. Oder: wie sieht Lebendigkeit aus?, in: Armen Avanessian et al., Vita aesthetica. Szenarien ästhetischer Lebendigkeit, Zürich/Berlin 2009, p. 31-44.

<u>17.</u> Johann Friedrich Blumenbach, Über den Bildungstrieb und das Zeugungsgeschäfte, Göttingen 1781.

18. Cf. Strindberg, Nisus formativus oder unbewußter Bildtrieb, in: Ein Blaubuch, p. 211.

<u>19.</u> William Henry Fox Talbot, The pencil of Nature, ed. by Barnett Newhall, New York 1969. Even Stri ndberg imprinted the blossom of a hellebore on photosensitive paper, which unfortunately did not survive. Cf. Strindberg, Über die Lichtwirkung der Fotografie. Betrachtungen aus Anlaß der X-Strahlen, in: Verwirrte Sinneseindrücke, p. 122-130.

<u>20.</u> Carol Armstrong, Cameraless: From Natural Illustration and Nature Pri nts to Manual and Photogenic Drawings and Other Botanographs, in: Ocean Flowers. Impressions from Nature, New York 2004, p. 87-165, 94f.

<u>21.</u> Cf. Per Stam, Naturvetenskapliga Skrifter II, August Strindbergs Samlade Verk Band 36, Stockholm 2003, p. 416ff, Appendix.

<u>22.</u> August Strindberg, Über die directe Farbfotografie, in: Verwirrte Sinneseindrücke p. 119-121, 119.

<u>23.</u> Procès-verbaux des séances de la Société astronomique de France, 1895, p. 29. Cf. Peter Geimer, Bilder aus Versehen. Eine Geschichte fotografischer Erscheinungen, Hamburg 2010, p. 115, note 187. <u>24.</u> August Strindberg, Über die Lichtwirkung bei der Fotografie. Betrachtungen aus Anlaß der X-Strahlen, in: Verwirrte Sinneseindrücke, p. 122-130, 128.

<u>25.</u> Cf. Vreni Hockenjos, Phantom, Schein, Traumbild. Zur visuellen Wahrnehmung bei August Strindberg, in: Walter Baumgartner/Thomas Fechner-Smarsly (ed.), August Strindberg. Der Dichter und die Medien, München 2003, p. 236-252.

<u>26.</u> Quoted after Fechner-Smarlsly 2007, p. 39.

<u>27.</u> Strindberg, Über die directe Farbfotografie, p. 119f.

28. Strindberg, Der Himmel und das Auge, in: Verwirrte Sinneseindrücke, p. 117-119, 117.

<u>29.</u> Cf. Fechner-Smarsly 2007, p. 33.

30. Strindberg, Der Himmel und das Auge, p. 118.

<u>31.</u> Daston/Galison 2007.

<u>32.</u> Quoted after Geimer 2010, p. 113, note 181.

<u>33.</u> Kathrin Busch, Artistic Research and the Poetics of Knowledge, in: Art & Research. A Journal of Ideas, Contexts and Methods, vol. 2, n. 2, 2009, <u>http://www.artandresearch.org.uk/v2n2/busch.html</u> (19.10.2010).

34. William Henry Fox Talbot, Photogenic Drawing. To the Editor of the Literary Gazette, in: Literary Gazette and Journal of Belles Lettres, Arts, Sciences, &ct, 2 nd of February 1839, nr. 1150, p. 73-74, 73.

35<u>.</u> Strindberg, Neue Kunstformen! Oder der Zufall im künstlerischen Schaffen, in: Verwirrte Sinneseindrücke, p. 30-38.

<u>36.</u> August Wilhelm Schlegel, Berliner Vorlesungen 1801-1802, in: Vorlesungen über Ästhetik, vol. 1 (1798-1803), ed. by Ernst Behler, Paderborn 1989, p. 258. Quoted after: Friedrich Weltzien, Describing Landscape – Experiencing Nature. August Wilhelm Schlegel's Conception of 'Selbstthätigkeit' and Aesthetic Judgement, in: Erna Fiorentini (ed.), Observing Nature – Representing Experience. The osmotic dynamics of Romanticism 1800-1850, Berlin 2007, p. 205-219, 213.

<u>37.</u> Quoted after Dario Gamboni, Potential images. Ambiguity and indeterminacy in modern art, London 2002, p. 29.

<u>38.</u> Cf. Otto Stelzer, Die Vorgeschichte der abstrakten Malerei. Denkmodelle und Vorbilder, München 1964.

<u>39.</u> Peter Geimer, Image as Trace: Speculations about an undead Paradigm, in: differences: A Journal of Feminist Cultural Studies, vol. 18, n. 1, 2007, p. 8-28, 8.

<u>40.</u> Sybille Krämer, Was also ist eine Spur? Und worin besteht ihre epistemologische Rolle? Eine Bestandsaufnahme, in: id. et al., Spur. Spurenlesen als Orientierungstechnik und Wissenskunst, Frankfurt a. Main 2007, p. 11-33, 16.

<u>41.</u> Sybille Krämer, Immanenz und Transzendenz der Spur. Über das epistemologische Doppelleben der Spur, in: id. et al., p. 155-181.

<u>42.</u> Cf. Geimer 2010, p. 17.

<u>43.</u> Ibid., p. 18.

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