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Panoramic Photography as Imagination Technology: Viollet-le-Duc and the Restoration of the Château de Pierrefonds

The critical questions for any theory of architectural restoration are of a piece with philosophical ones about identity: what degree of alteration can a building undergo and remain the same thing? What is the relation between continuity and change in the restoration process? Eugène Viollet-le-Duc spent his entire career elaborating and defining these questions in writing and practice. He investigated the relation between invariance, or relative sameness, and variance, or transformation, in order to explore the outer limits of formal possibility within architectural re-construction. Simply put, he pushed the limits of variation within the continuity or 'sameness' of previous forms. Restoration was modern for Viollet-le-Duc precisely because it was linked to the imaginative project of generating new architectural forms out of old ones.

Nowhere was this project deployed with more force and systematic rigor than his restoration of the Château de Pierrefonds between 1858 and 1870. I argue that for Viollet-le-Duc, Pierrefonds was an 'imagination technology' – a tool that calls attention to the fact that imagining, defined as the ongoing habitual process of structuring and restructuring experience, is a pragmatic activity that is often aided, framed, and extended by various technological apparatuses. In this paper I analyze how Viollet-le-Duc used a specific panoramic photographic technology – and its metaphorics of perception and vision – in the restoration process to reveal the many possible formal configurations latent within the building's manifest appearance.[1]

The Château de Pierrefonds, located twelve kilometers from the Château de Compiègne on the opposite side of the Forêt de Compiègne, was commissioned by Louis d'Orléans in the latter part of the fourteenth century and built by c. 1406. A siege of the castle ordered by Louis XIII in 1616 resulted in a substantial breach in the towers of the main façade. The next year, Cardinal Richelieu ordered the dismantling of the fortress' defenses, which included destroying major portions of the main façade, gutting or demolishing the eight towers, and burning the floor and roof beams. The château lay in ruins for more than two centuries, during which it was a popular site for 'voyages pittoresques' to view the striking ruins above the town. (fig., p. xx) Napoleon ordered the French state to acquire the ruined castle in

Picturesque ruins of the Château de Pierrefonds, lithograph (Archive Departmentale de l'Oise, Beauvais)
View of the southeast façade of the Château de Pierrefonds (Photograph by the author)

1813, but it was not until 1858 that restoration began, when Napoleon III entrusted Viollet-le-Duc with a partial restoration, which left the restored donjon and two towers surrounded by ruins. Four years later, the king, desiring Pierrefonds as an imperial residence, ordered a full restoration. By 1868 work had slowed considerably, and much of the exterior was finished by 1870. (fig., p. xx)

In the midst of his restoration, or rather, reconstruction, of the château in 1866, Viollet-le-Duc ordered a series of nineteen panoramic photographs to be taken of the structure with the «planchette photographique», a camera developed and patented by Auguste Chevallier.[2] (fig., p. xx) The camera, designed for topographical purposes, produced circular photographs that registered a 360-degree view of the horizon on a glass plate negative using the wet collodion process.[3] (fig., p. xx) Chevallier's aim was to perfect a technique of panoramic photography that could be used for precise topographical mapping. The idea of using photography in the production of surveys, plans, and maps was articulated as early as 1839 by François Arago in his report on Daguerre's «invention» to the French government and the Academy of Sciences. The development of this possibility into the nascent field of what is now called photogrammetry – the discipline of performing indirect mappings of a given terrain or built environment through photography – dates to the mid-nineteenth century. Chevallier's planchette and its resultant photographs are one of photogrammetry's earliest manifestations.[4]

It was claimed that Chevallier's panoramic photographs could generate a plan directly from the information registered on their surfaces. For the shooting of the photographs, the planchette was set up along a series of points, called stations, located around the château. The lens and protective case (the «chambre noire») rotated 360 degrees, projecting the full view from each station onto the glass plate negative. After the panoramic view from a specific station was registered, the same procedure was conducted at a second station onto a new plate, and so on. In order to produce a topographical plan from the resulting series of photographs, lines are traced from the center of two photographs through that portion of the building that appears on both photographs until these lines meet. The point of intersection indicates the position of that part of the building on the plan. This process is continued with a third photograph taken from a different station, and so forth.[5]

Auguste Chevallier's «Planchette Photographique», 1866
(Technisches Museum, Vienna; photograph by Martin Reinhart)

Auguste Chevallier, Panoramic photograph taken from within the châtelet of the Château de Pierrefonds, 1866 (© Musée des Arts et Métiers-CNAM, Paris; photograph by Pascal Faligot/Seventh Square)
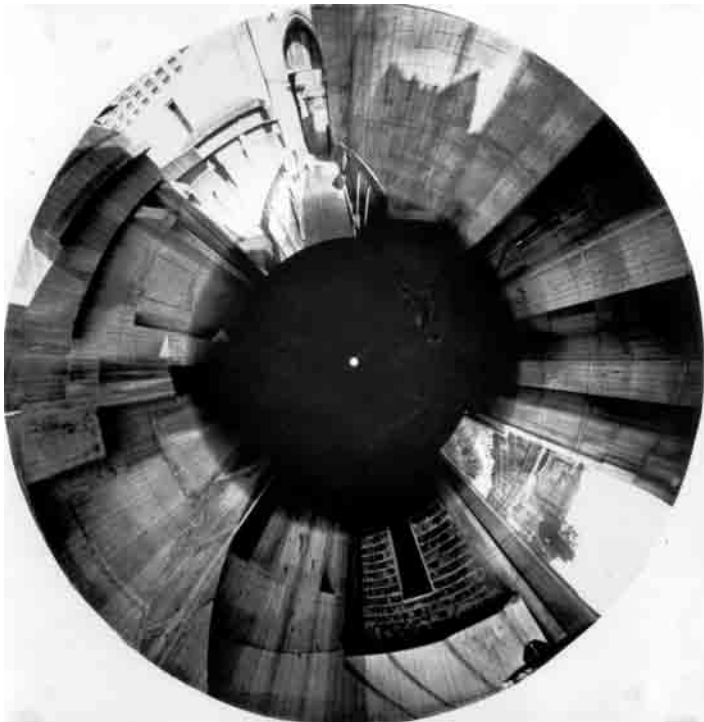
A visual exemplification of this process is seen in a photograph entitled «Plan du Château Imperial de Pierrefonds levé à la Planchette Photographique de Auguste Chevallier», which shows the panoramic photographs taken by the planchette positioned in their stations around a plan of Pierrefonds. (fig., p. xx) The original, large-scale plan measured approximately 4 x 2 meters and was shown at the 1867 Universal Exhibition in Paris.[6] The réseau of intersecting and overlapping site/sight lines emanating from each photographic station are clearly marked on the plan, demonstrating how it was supposedly generated from the process just described. I refer to this image as the 'photographic plan'.[7] I have located ten prints, often in multiple copies, of the nineteen photographs shown, each of which measures approximately 32 centimeters in diameter.

Viollet-le-Duc put a kinaesthetic spin on the necessity of having the planchette located at a sequence of stations around the perimeter of the château in order to generate its plan through triangulation. The stations are coordinated with and superimposed on his circulation plan for Pierrefonds, in which the path of an imaginary viewer-visitor is clearly indicated by a broken line interspersed with arrows. Thus the planchette was placed at different stations around the château following the trajectory of a physical body moving around the building and eventually through its interior courtyard.[8] The panoramic photographs also acknowledge that bodily movement is required in order to see a visual field extending beyond that encompassed by binocular vision. Chevallier's planchette is one of those optical devices, such as the stereoscope, that Jonathan Crary has argued are prosthetic extensions and acknowledgments of embodied acts of seeing in the nineteenth century.[9] Not surprisingly, each planchette station and photograph represented, according to Chevallier's primary metaphor for his panoramas, the embodied eye of a viewer rotating around his or her own axis with regular movement. As the original patent for the machine stated:

> «This movement, like the whole operation, can be explained if one imagines that the sensitive plate is nothing but a circular mirror of which the circumference is divided into degrees, so as to take only a certain stretch of the horizon at a time, and that the exterior images will come to act successively on each of its parts, as they would do on the eye of an observer who turned around himself with a regular movement – albeit with this difference: that in the eye images succeed one another while successively occupying the same position, that is to say by losing the first so that one can see the second, while in the camera they remain successively fixed.»[10]

The implicit discussion of succession versus superimposition in Chevallier's passage suggests that there is an archaeology of vision and perception being articulated here. The locus classicus for the contemporary formulation of this archaeology is found in Freud's many dis-analogies for the psychic apparatus – optical devices, the mystic writing-pad, the archaeology of Rome – which demonstrate the separation
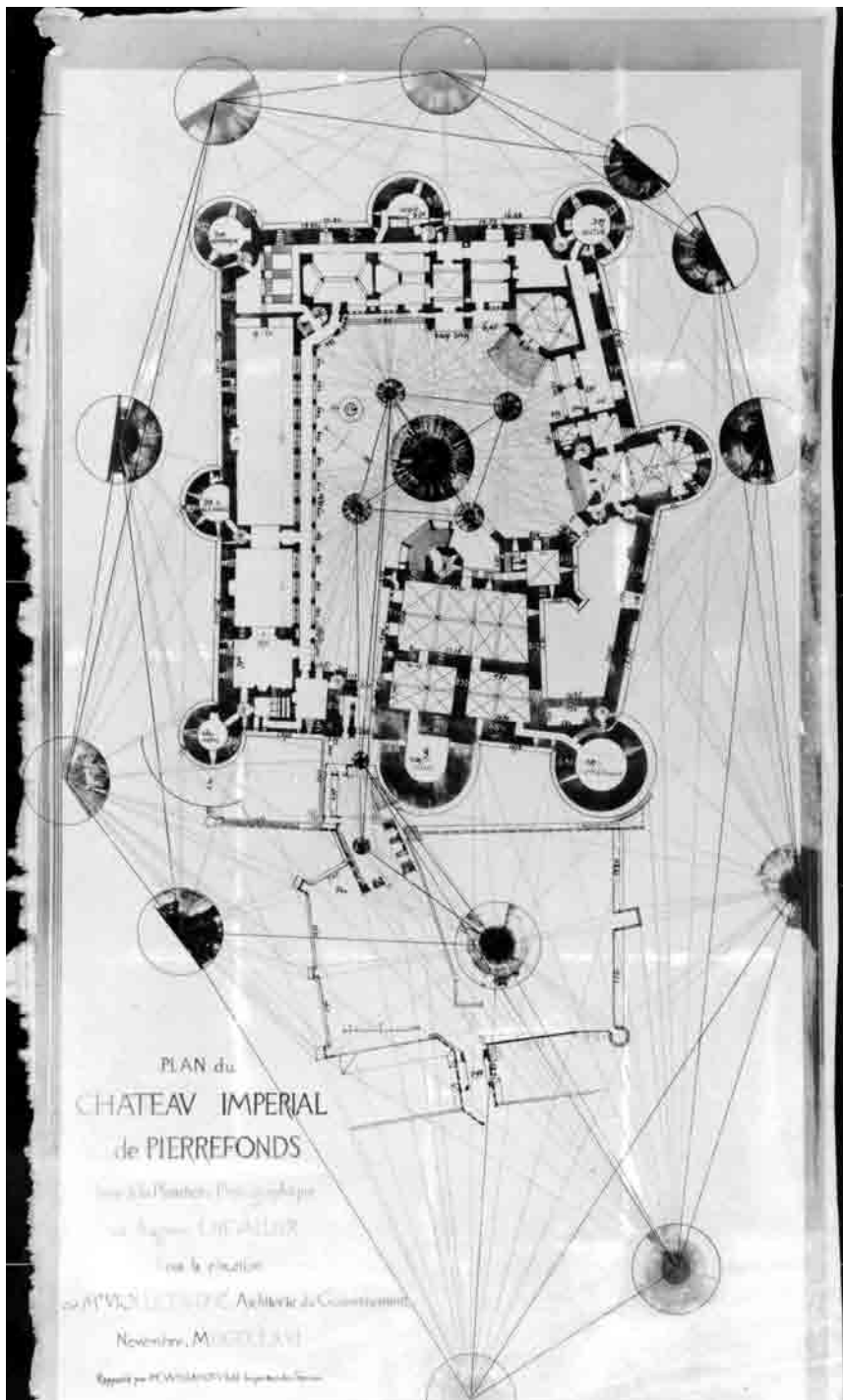
Auguste Chevallier, Plan du Château Imperial de Pierrefonds levé à la planchette photographique, 1866 (Archive Departementale de l'Oise, Beauvais)

and links between memory and perception and between the conscious and the un-conscious as they are registered on virtual or actual surfaces. Freud's dis-analogies are not the origin of this problematic but a kind of loose summation of the nine-teenth-century preoccupation with such cognitive, perceptual, and real archaeolo-gies. In a famous passage in *Civilization and Its Discontents*, Freud makes his striking dis-analogy between the archaeology of Rome and the archaeology of the mind:

> «Now let us, by a flight of imagination, suppose that Rome is not a human habitation but a psychical entity with a similarly long and copious past – an entity, that is to say, in which nothing that has once come into existence will have passed away and all the earlier phases of development continue to exist alongside the latest one.»[11]

He is well aware that this is an impossible situation in an actual city or any of its representations: «The fact remains that only in the mind is such a preservation of all the earlier stages alongside of the final form possible, and that we are not in a position to represent this phenomenon in pictorial terms.»[12] Freud goes on to state the crucial difference between an archaeology of the mind that preserves all stages of sedimented history – a psychic entity – and its material representation: «If we want to represent historical sequence in spatial terms we can do it by juxtaposition in space: the same space cannot have two different contents.»[13] Simply put, the continuous accumulation of information on the same spot would eventually reach a point where it would begin to efface itself.

Unlike Freud's mystic-writing pad or Chevallier's embodied eye in the patent, there are not two layers or systems on the photographic device – one that receives the image and then is cleared and another to retain its memory trace. There is only one receptive surface on the planchette: the sensitized glass plate itself. If the plate cannot ensure, as the patent claims, that «the exterior images will come to act suc-cessively on each of its parts» and remain «successively fixed», there will be occlu-sion, and fundamentally illegible overlapping image-points will result. Precisely because the planchette's sensitized surface, unlike the human eye, retained every-thing, its success was predicated on the sharp, clear, and relatively discrete regis-tration of successive images. The patents and supporting literature for the planchette insist at great length that the device did not register the panorama in confused, overlapping images. This claim was predicated on the assertion that when the planchette rotated, only discrete sectors of the glass plate were succes-sively exposed as the diaphragm and optical unit passed over it.

Yet palimpsesting was constitutive of Chevallier's panoramic photographs; the *glissements lateraux* of the registered images was unavoidable. Because of the circular rotation of the machine, the adjustable wedge-shaped diaphragm – even when closed down to a very narrow opening – allowed a portion of the preceding
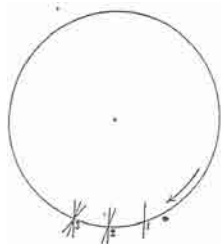
Diagram showing the sliding of images on Chevallier's panoramic photographs, (E. Crouzet, «Étude sur l'Emploi des Perspectives et de la Photographie dans l'Art des Levers du Terrain»,
in: Revue du Génie Militaire 22 [décembre 1901])

image to slide laterally into the viewing field of the following sector. A diagram of this phenomenon demonstrates that, contrary to Chevallier's claims, there are not continuous and discreet images but densely overlapping ones.[14] (fig., p. xx) The overlapping is easy to detect on the photographs and has the effect of filmic super-imposition, creating a multi-layered palimpsest more conducive to evocative poetic effects than discretely legible form. (fig., p. xx)

Obviously, this is a fatal flaw for topographical mapping. The confusing images made it difficult to register the necessary reference points for determining the azimuth angles of the object under investigation.[15] Due to the sliding of the image, the lines recording the azimuthal angle of each point on the building would register complete confusion at the same contracted spot in the center of the photo-graphs and would be of little use in generating the triangulation necessary to con-struct a plan. It appears that the photographic 'eye' is thus occluded or blinded at its center. Paté, one of Chevallier's most unabashed supporters, noted that because of the imprecision in registering the azimuthal angles, the device could not be used to generate precise plans.[16] Anamorphic distortion was also intrinsic to the pano-ramic photographs due to the convergence of all vertical lines towards the center of the glass plate negative. Most of the elements in the photographs show a com-pression of two to three times their normal size, resulting in extreme vertical elong-ation.

Chevallier's planchette so drastically modified the objects of its regard that it was often extremely difficult to recognize their familiar appearance, let alone to lo-cate specific points for topographical mapping. Measurement was rendered even more difficult using the photographs of Pierrefonds, which were taken during the restoration process when the building did not always offer clearly demarcated elements. To make an analogy, it was as if Viollet-le-Duc was practicing a kind of architectural teratogeny (the experimental production of monstrosities), submit-ting the building to a series of systematic disfiguring experiments during its period of gestation and metamorphosis. The panoramic photographs do not survey a building with an already firm and clearly demarcated 'internal horizon'; they sur-vey, or take the measure of, the very possibility for an internal horizon that has yet to be strictly defined and is presently under construction.

As one later commentator noted, «Viollet-le-Duc had the idea to execute a plan of the Château de Pierrefonds with the aid of images which cruelly disfigured this beautiful structure».[17] Despite these serious flaws, Viollet-le-Duc *chose* Chevallier's device over other methods of topographical photography.[18] The fundamental question is then: why did Viollet-le-Duc use Chevallier's panoramas to apparently produce an accurate plan of Pierrefonds when he probably knew that the panoramas were inaccurate and constitutively deforming? Lauren O'Connell has carefully argued that Viollet-le-Duc distrusted photography because of its automatic registering of perceptual distortions.[19] According to this argument, photography was less «positivistic» than drawing for Viollet-le-Duc because it reproduced the illusions to which the eye was subjected, while drawing analytically corrected such distortions. Strictly speaking, however, photography is not less but more «positivistic» – or better, phenomenological – because it deals strictly with the optical registration of surfaces. Viollet-le-Duc was interested in the planchette device precisely because of its automatic and exaggerated registering of perceptual distortions. In short, the planchette photographs allowed him to constitutively distort the château through anamorphosis and palimpsesting. Viollet-le-Duc was interested in the systematic disfiguring and transforming effects of all optical devices, from the 'naked' eye to optical deformations produced by natural phenomena to photographic apparatuses. He embraced this continuity as the basis for a theoretical and practical understanding of the relation between representation, knowledge, and architecture. In the skeptical tradition stretching back to Descartes – and according to Stanley Cavell, forward to the Romantics – it is through the hyperbolization or exaggeration of the deceptive senses (particularly the difficulty of seeing) that certitude is supposed to emerge.[20] Viollet-le-Duc, however, deliberately embraces these acts of deformation and hyberbolization. We might think of this as an instantiation of what Michel Foucault characterizes as the nineteenth century's acknowledgement of the opacity, exteriority and 'unthought' dimensions at the heart of the supposedly sovereign transparency of thinking. Viollet-le-Duc was interested in the systematic disfiguring and transforming effects of all optical devices, from the 'naked' eye, to the visual deformations produced by natural phenomena, to photographic apparatuses. He embraced this continuity as the basis for a theoretical and practical understanding of the relation between representation, knowledge, and architecture.

Not surprisingly, the Château de Pierrefonds was understood by Viollet-le-Duc as a carefully constructed optical device that surveyed its topographical surroundings from the most immediate environs to the farthest limits of the external horizon. He pays careful attention in his writings and images to the architectural dispositions required to coordinate site lines in order to properly defend the château. One could say the château is a literal 'engine of visualization'. So close is

the imbrication of vision and warfare for Viollet-le-Duc that it is often difficult to tell which is the tenor and which is the vehicle in the metaphorical transfer.[21] Vision, and the 'sensory apparatus' in general, is caught up in a web of possible occlusions/penetrations and defensive/offensive positions allegorized by the concept of siege warfare.

The planchette stations placed around the château were akin to a siege of the fortress; they represent a chiasmatic doubling back of the site/sight lines in which 'shots' were 'fired' at the château. (fig., p. xx) Given that the primary use of Chevallier's planchette was for military purposes – military engineers could use it for planning strategies of attack or defense – the panoramic camera dovetailed perfectly with Viollet-le-Duc's consistent structural analogy between the art of warfare and the restoration process. In his section on military architecture in the *Dictionnaire Raisonné* he noted that, «it is well, we think, to know how in past times some have applied all the abilities of their minds and all the material force at their command to the work of destruction, others to that of preservation».[22] In his article on «Restoration» in the *Dictionnaire Raisonné* this analogy is rendered explicit: «His work [the restorer's] amounts to conducting a kind of warfare; he must carry out a series of tactical maneuvers, each of which must be modified each day on the basis of constant observations of the successive effects that are being produced.»[23]

At the heart of this analogy between warfare and restoration are the palimpsestings and reversals of offensive and defensive, active and passive positions. Viollet-le-Duc makes it very clear that active and passive forces are manifested in *both* positions of besieged and attacker: «It often happened that the parts played by the hostile forces were reversed, and that the assailants, driven back by the sorties
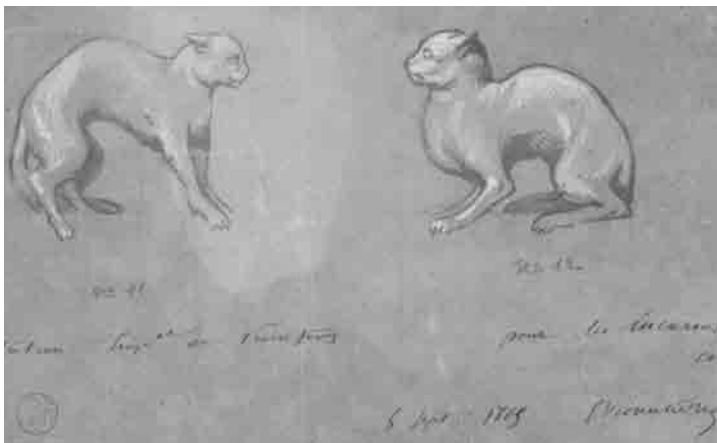
Eugène Viollet-le-Duc, Drawing of two cats for the lucarnes in the interior courtyard of the Château de Pierrefonds, 1865 (Médiathèque de l'Architecture et du Patrimoine, Paris)

of the garrisons and forced to take refuge in their camp, became besieged in their turn.»[24] He argues that the real advances in attack and defense – and their mutually determining nature – were due to the engineers entrusted with the task of constructing engines capable of both. The one «machine de guerre» that receives the most attention by Viollet-le-Duc is the *CHAT* – a moveable wooden structure, usually covered with planks, iron, and hides – which was pushed to the foot of fortress walls during a siege and provided cover for the attackers to batter and sap the enemy's towers and walls.[25] Often it was part of a hybrid structure called a *chat-chateils*.[26] These devices consisted of moveable towers used to transport offensive machinery and men over the opponent's walls. They also served to defend the lower stories, which consisted of a traditional *chat*. Viollet-le-Duc notes that these structures were described as *chats fortifiés des châteaux* or *chats faux*.[27] Through the contraction of the phrase, *chats faux*, Viollet-le-Duc traces the word, *eschaffaux*, in modern French, *échafaud*, back to the Latin word, *chat*. Thus scaffolding, a raised wooden platform used to support construction and restoration work, is etymologically rooted in the passive/active terminology of siege warfare.

But the importance of the *chat* as a figural demonstration of the palimpsesting of passive and active forces is also clearly, and permanently, registered on the physical structure of Pierrefonds itself. Viollet-le-Duc provided drawings for the thirty-two cats that adorn the lucarnes of the interior courtyard. (fig., p. xx) He had a life-long interest in cats, owned one, and closely studied their ordinary habits and behavior.[28] Drawings of cats are in evidence from his earliest letters written from Italy in the 1830s to his last book published in 1879. One might say that the cat was a kind of touchstone for his «being-in-the-world».[29] Among other qualities, Viollet-le-Duc admired the cat's unconscious ability to twist its body into a variety of graceful 'figures'. No doubt he was well attuned to the fact that despite their domestic nature, many of their postures were keyed to forms of attack and defense. As anyone who owns a cat well knows, even its form of play is tantamount to fighting. In fact, the cats Viollet-le-Duc designed for Pierrefonds display quite specific qualities that link them to the palimpsesting of active and passive forces for which I have been arguing. Arched backs, pinned-back ears, contracted haunches, and particular facial expressions register what the ethologist Paul Leyhausen calls the «mutual superimposition of attack and defense behavior».[30] One can correlate to a very precise degree the nature of this superimposition by comparing Viollet-le-Duc's drawings to Leyhausen's diagrammatic illustration of this phenomenon.[31] (fig., p. xx) Many of Viollet-le-Duc's drawings tend to range in the bottom right of Leyhausen's diagram – the area of maximum superimposition of attack and defense behavior. But these antagonistic impulses never perfectly overlap into the frozen figure of that superimposition (one assumes that a perfect superimposition of attack and defense behavior would result in stasis). It is the complete range of figural
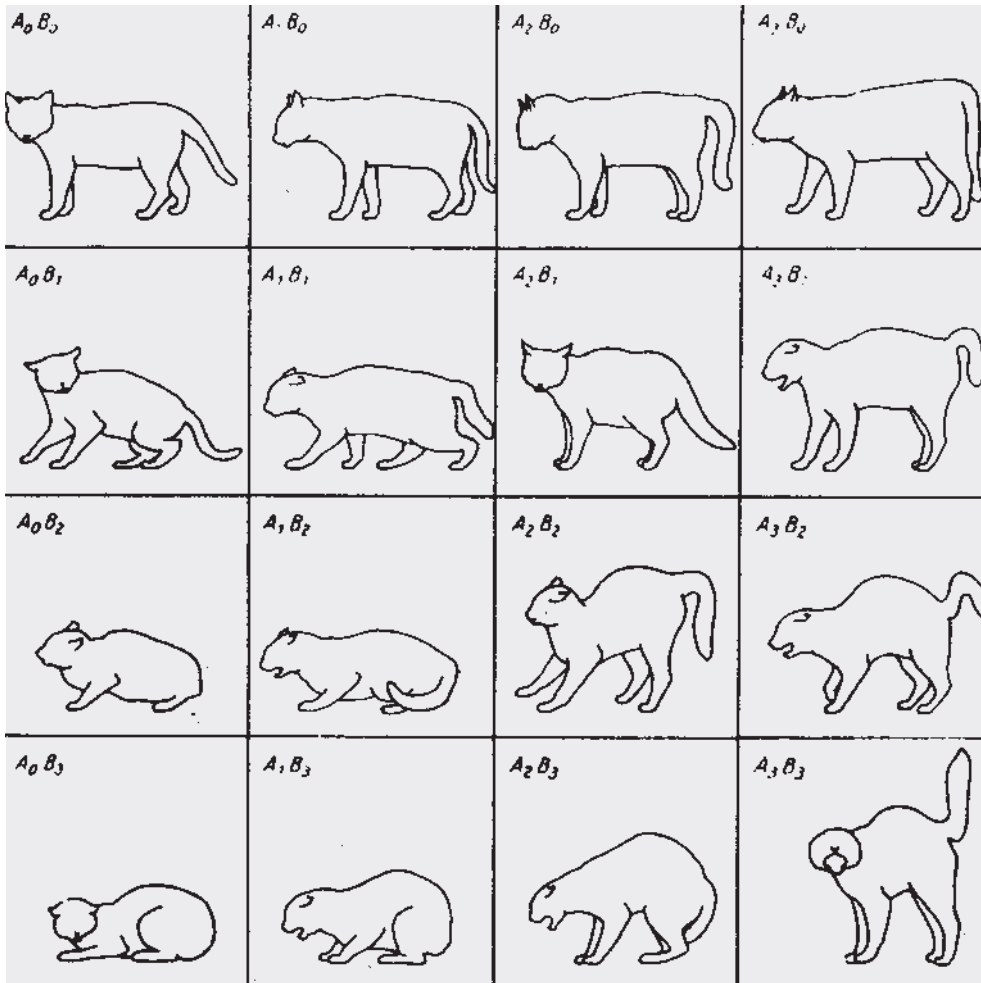
Diagram showing the superimposition of attack and defense behavior in cats
(Leyhausen 1979)

possibilities enabled by the palimpsesting of active and passive forces that Ley-
hausen's diagram records, and this is what Viollet-le-Duc is ultimately interested in
exploring.

In the scholarship on Viollet-le-Duc, the 'struggle' between passive and active
forces is usually interpreted as 'resolved' through the principle of equilibrium.
The Gothic structure is explained as a carefully calibrated technical device that
equalizes and counterbalances pressures onto specific points and thus demonstrates
its mastering of material forces. But siege warfare is fundamentally about upsetting
the balance of the opponent by forcing a breach in their 'protective shield'. Equi-

librium is never totally recovered by any counter-defense, but nor is the 'protective shield' merely overwhelmed. Viollet-le-Duc's palimpsesting of attack and defense is more akin to a chiasmatic exchange that never quite stabilizes than a dialectic resulting in a subsequent equilibrium. Thus, Viollet-le-Duc's statements aside, equilibrium, the purported achievement of the *restorative* process, is not the primary nor the most interesting result of his formulation of passive and active forces.

For the play between the two creates what Deleuze has called a «plane of consistency»: a membrane or surface where form never quite stabilizes but is in constant transformation through continuous foldings, contractions, and expansions.[32] According to Viollet-le-Duc, as well as other theorists such as John Ruskin, Gothic architecture was particularly disposed to this kind of flexibility in both material and perceptual terms. The physical structure itself was seen as being almost organic in its disposition to contract, expand, and transform itself.[33] This «plane of consistency» required the craft of the surveyor in order to measure the «longitude and latitude» of its possible configurations.[34]

For Viollet-le-Duc, Chevallier's anamorphically distorted panoramic photographs provided a flexible surface of inscription perfectly suited to surveying Pierrefonds' imaginative possibilities. If the metaphorics of perspective since the fifteenth century emphasize the denial of the opacity of the surface in return for a window to look through – a literal attempt to «pierce through the wall», as Renaissance commentators put it – then anamorphosis has always been the systematic disfiguration of perspective: a blocking off, filling-out, restoration, and transformation of the pierced surface. Anamorphic pictures rely on perspective but they do not fulfill its 'window conditions'. They remain strictly oriented towards the surface, sometimes hovering slightly above it, often topologically transforming it.[35]

Viollet-le-Duc was intimately familiar with the malleable properties of anamorphic images, which could take a given object then stretch and transform it into the appearance of another object.[36] The anamorphically distorted panoramic photographs Viollet-le-Duc ordered to be taken of Pierrefonds were the perfect counterpart to his topographical conception of architectural restoration.[37] If trauma, in the strict sense of the term, is a literal breach in a structure's 'protective shield', leaving it damaged or in ruins, the panoramic photographs simultaneously restore the physical surface of the structure and allow imaginative elaboration to occur.

I would argue that Viollet-le-Duc used the panoramic photographs of Pierrefonds to submit the building to a series of imaginary deformations, a process called eidetic or imaginative variation in phenomenological methodology.[38] The phenomenologist refashions the given data of an object, i.e., a building or chair, by freely varying it in his or her imagination or, in a less idealist vein, through actual
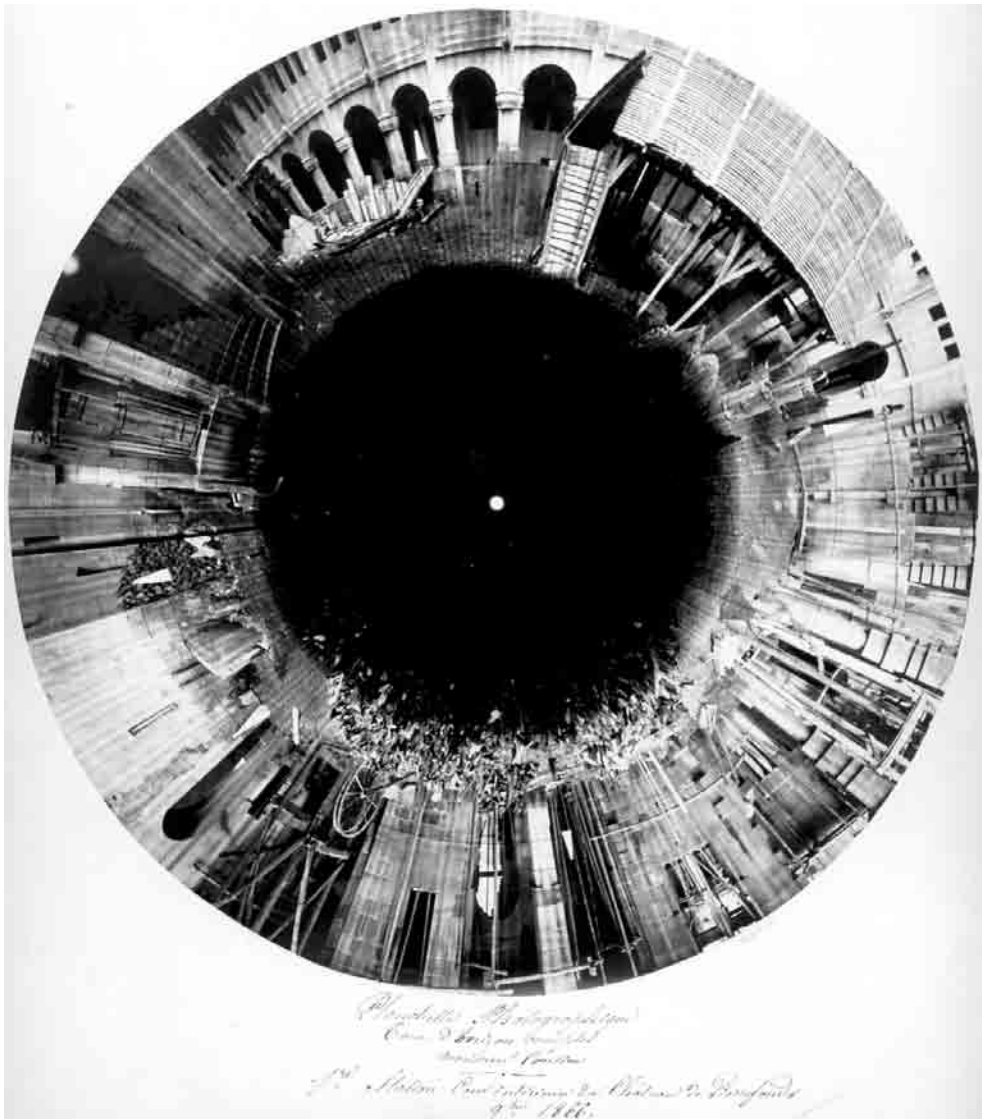
Auguste Chevallier, Panoramic photographic taken from interior courtyard of the Château de Pierrefonds, 1866 (Technisches Museum, Vienna)

images. He or she allows the data to move continuously from the actual appearance of a building to its real possibilities.[39] The purposeful bracketing of the referent – or aspects of it – and the systematic exploration of its imaginative possibilities is well documented in Viollet-le-Duc's work, although it has never been elucidated in these terms.[40]

The familiar structure of Pierrefonds is thrown into question by Chevallier's photographs because they reveal a range of possible formal configurations latent

within the building's manifest appearance. Viollet-le-Duc takes advantage of the anamorphically distorted photographs to condense, stretch, abstract, and project the forms of Pierrefonds beyond their given limits.[41] The most heavily distorted panoramic photographs are taken from inside the châtelets in front of the main entranceway to the interior courtyard. (fig., p. xx) The palimpsesting, anamorphic distortion, and under- and over-exposure create a poetic study of pared-down geometric shapes. The architectural features are elongated vertically, condensed in overlapping planes, and then spread out in a fan-like manner over the surface of the image. The photographs taken in the courtyard of Pierrefonds show very clearly the rhythmic undulation of the architectural forms as they extend across the surface of the image. (fig., p. xx) The anamorphic deformations twist and stretch the colonnaded gallery and other architectural elements like an image imprinted on a sheet of rubber. The distortions also create dense spaces that are permeated by ghostly apparitions. Other photographs are haunted by elongated human figures in medieval and modern dress that appear in odd places throughout the château; and even one of Viollet-le-Duc's famous lizards that adorn the interior courtyard has taken on life and appears to be scurrying down the wall at a furious pace.

The vast majority of the photographs include scaffolding. Due to their anamorphic qualities, many show the scaffolding tightly woven into the architecture itself. Anamorphosis not only disfigures the rigid architectonic latticework of vertical and horizontals poles, but it also actually pulls them taut into the lithic structure and weaves them in and out through any available openings. (fig., p. xx) These photographs recall the wooden structures, such as the *chat*, Gallo-Roman fortified camps, temporary wooden defensive structures, etc., that are woven into Viollet-le-Duc's own generating narrative of the history of the château as such. In fact it is only in these «provisional constructions» that the traces of these structures survive in active use.[42] In this way, the scaffolding operates as a mode of transference *within* the restoration process. The photographs tacitly acknowledge that the conceptual and perceptual scaffolding supporting the process of analytic reconstruction is always within the work of the image and thus itself always under constant deformation and transformation. The architectural object contains within itself the phases and phantasms of its construction and destruction; its framing conditions are within the scene of representation. Viollet-le-Duc seems to want us to mistake the scaffolding for the building: to recognize that restoration is a *construction provisoire*. We can literally see Viollet-le-Duc's use of the panoramic photographs as a kind of free floating analysis, one that is a subtle and imaginative tool attuned to the rhythms and repressed figures in its object of regard.[43]

Another panoramic photograph of the château comes to mind. (fig., p. xx) In it the building is so radically condensed, vertically elongated, and displaced to the outer edges of the photograph, that it looks – in optical terms – like a peripheral
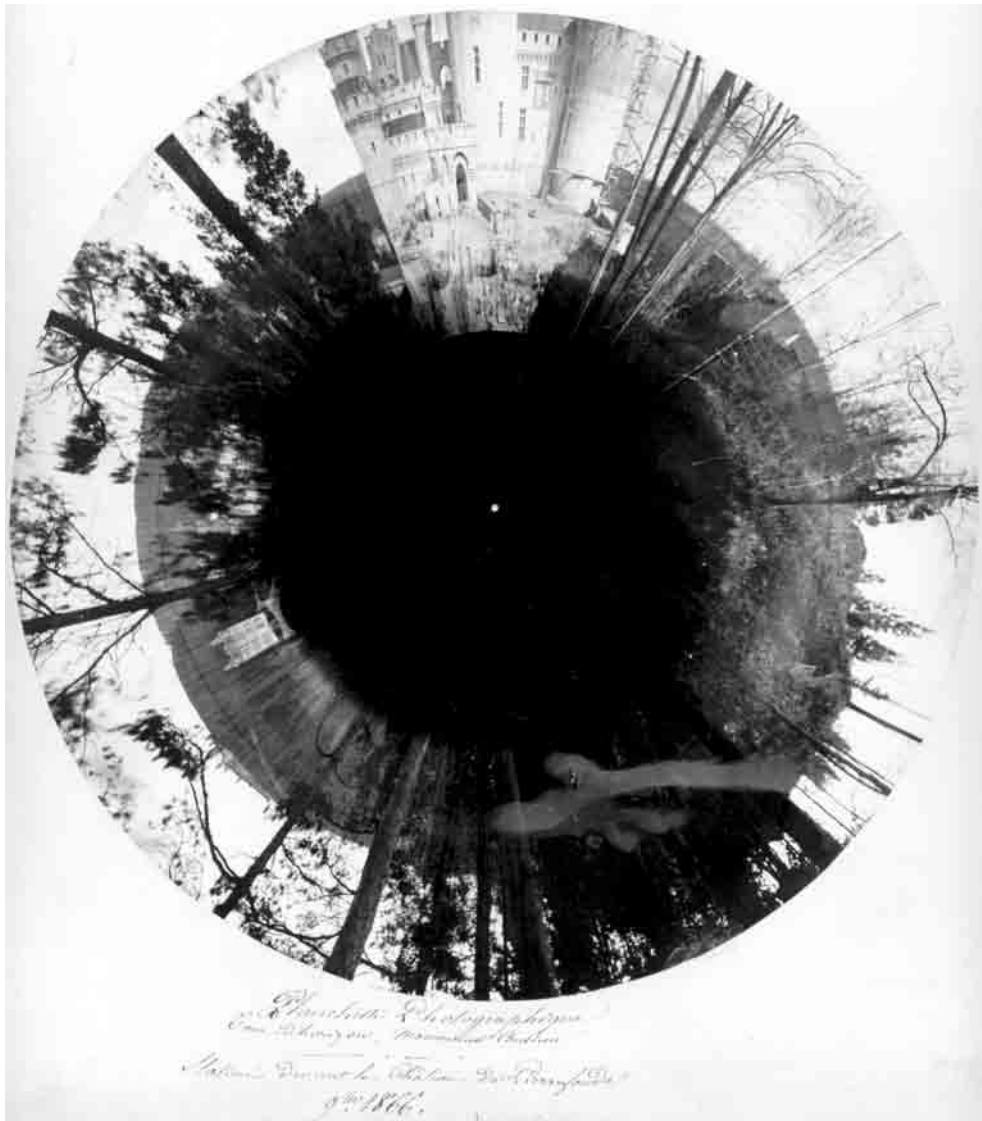
Auguste Chevallier, Panoramic photograph taken from the southwest showing the main façade of the Château de Pierrefonds, 1866 (Technisches Museum, Vienna)

view, rather than a foveal one, in its appearance and placement. It is an image that seems to have been created in a state of distracted reverie rather than focused attention. Indeed, these photographs of Pierrefonds rather closely resemble the ultimate oneiric and imaginative figure of the château in the nineteenth century: the illuminations found in the *Très Riches Heures du Duc de Berry*. As we have seen, the panoramic photographs not only explore the horizons of imaginative formal possibility in a general sense, but they are capable of exploring more specific

figural, temporal, and historical ones as well: Jean Duc du Berry, the patron of the *Très Riches Heures*, was an uncle of Louis d'Orléans, who commissioned the construction of Pierrefonds.

At the heart of Viollet-le-Duc's methodology is what I call a 'science' of possibilities: the systematic exploration of the imaginative and perceptual possibilities of phenomena. If the planchette was placed at different stations around the château following the trajectory of the viewer-visitor, then the experience of Pierrefonds is meant to be an exercise in imagination; the viewer's judgments are continually challenged and honed as he or she encounters multiple horizons of discovery.[44] This is what Viollet-le-Duc calls the «habit of reasoning» – a constant refining of, and reflection on, habitual action so that one experiences phenomenon in new and, perhaps, strange ways.[45] If the concept of the horizon, in the phenomenological sense, is understood as the manifold possibilities implicit in object perception, then the photographs are *about* the process of exploring those horizons. The anamorphically distorted photographs hyperbolize the effects of contraction and expansion, revelation and concealment that are experienced by an actual viewer walking around Pierrefonds. One could say that the photographs are a technology for thematizing the notion of the unthematized horizon.

The unthematized horizon is grounded in habit, and the 'bracketing out' of this natural ground is the acknowledgment of it as a methodology for investigating the possibilities of phenomenon. The panoramic photographs are *ecstatic*: they literally show their own ontological centers – as noted in the patent, the metaphorical point where the human body turns around on its own axis – in the process of being evacuated or 'bracketed out', and the images are sedimented centrifugally out towards the periphery of the glass plate.[46] (fig., p. xx) The panoramic photographs demonstrate the creative process of objectification as such, a point made clear by the etymology of the Greek word, anamorphosis, which means «to form again». We see the process by which the excentric image is formed – how, as Stanley Cavell has noted, the mechanical genesis of photographs makes the world present to us in all its fullness through our absence from it (like the process of habituation itself).[47]

If the ultimate purpose of variation methodology, illustrated by Viollet-le-Duc's use of the panoramic photographs at Pierrefonds, is to find the essential structure present through all these possible variations, I posit that the essential structure of the Pierrefonds restoration is, to a great degree, imagination itself – the essence or invariance of imagination being precisely variation, change or transformation. The philosopher J.N. Mohanty used a Venn diagram to illustrate the process of imaginative variation.[48] Like a series of Galton's superimposed photographs, the overlapping variations that do not coincide at the same point neutralize each other and become indistinct; the common or invariant features that

endure throughout the variations are sharply distinct and focused in the section at the center of the diagram. In terms of my argument about the photographs, it is exactly the reverse: the center is a blind spot and what remains constant is the continual process of tracking the imaginative variations that circle around and trace the contours of this 'essential' void.

Viollet-le-Duc's method allowed him to demonstrate his larger claim: that the restoration of Gothic architecture was an 'imagination technology' par excellence because through devices such as the planchette it opened up fecund directions, and possible routes, for an immanent modern architecture. He was not interested in reconstructing 'a' building so much as in having perspicuous views of the foundations of possible buildings.[49] The fact that he was never able to actualize or 'construct' those buildings, nor complete the restoration of Pierrefonds, is probably to his credit: the fact that his work gave shape to its own impossibility is the best indication of its modernity. He not only surveys Pierrefonds in the literal topographical sense of that word, but in the imaginative and metaphorical senses as well: he explores the ends of images and the horizons of possibility.

1   This essay was originally written for a colloquium on Viollet-le-Duc held at the Stiftung Bibliothek Werner Oechslin in 2001. I thank Werner Oechslin for inviting me to participate. Subsequently, I published an essay on the topic of these photographs, entitled «Panoramic Photography and the Restoration of the Château de Pierrefonds» (see Vinegar 2008, pp.70–81), and an essay on Viollet-le-Duc's theory of restoration entitled, «Viollet-le-Duc and Restoration in the Future Anterior» (see Vinegar 2006b, pp. 57–67). This material is incorporated in my forthcoming book on Viollet-le-Duc entitled, *Perspicuous Views and the Foundations of Possible Buildings* (see also Vinegar 2001).

2   Auguste Chevallier was a Navy medical doctor at the Gros-Caillou Military Hospital in Paris. Aside from three letters written by Auguste Chevallier – one of them written to Lucjan Wyganowski, the site manager at Pierrefonds – I have not found any documentation about Viollet-le-Duc's commissioning Chevallier to take the photographs at Pierrefonds. But there is plenty of visual and written material on the planchette device.

3   Chevallier submitted the first patent for the planchette in 1858. Between 1858 and 1866 he continually modified his device, submitting addendums to his initial patent, depositing a new patent with subsequent additions, and creating many variants on paper, some of which were built. I have found two different extant models of the planchette photographique: one is located in the Technisches Museum in Vienna, and other is in the collection of the Conservatoire des Arts et Métiers in Paris. Both devices were probably constructed around 1865, as they loosely correspond to addendums

to his patents submitted in those years. After closely investigating both devices, I believe the one in Vienna is the version used to take the panoramic photographs at Pierrefonds.

4   Not only was his one of the first cameras made specifically for topographical mapping, but he was also most likely the first to develop a photographic apparatus capable of producing completely circular, 360-degree images.

5   This is based on very simple geometry used in traditional surveying: a triangle is determined when we know the length of its base and two angles, or two sides and one angle. Each photograph was used as a kind of protractor from which the true angles between intersecting points could be connected by the mapmaker.

6   I have been unable to locate the large-scale plan, nine of the 180-degree photographs located around the sides of the château, or any of the glass plate negatives.

7   The information written on the bottom left of this image suggests that Viollet-le-Duc not only ordered but also subsequently directed Chevallier's photographic mapping campaign at Pierrefonds. The phrase «Rapporté par M.Wyganowski» indicates that Lucjan Wyganowski, Viollet-le-Duc's site manager at Pierrefonds, did the actual work to generate the plan from the photographs after they had been taken.

8   This kind of phenomenological experience of the building is undoubtedly inspired by the Greek picturesque as it was discussed by the classicists, archaeologists, and architects working at the French School in Athens (1846–1863). They emphasized the Acropolis as a series of architectural arrangements framed in and by

oblique and distorted views activated by a body moving through their environments. One might say that they formulated a kind of implicit phenomenology in their emphasis on the intertwining of vision and movement in the discovery of the multiple aspects of object perception.

9 Crary 1990. The specific pictorial and technical antecedents for Chevallier's photographs are the completely circular, and often anamorphically distorted, panoramic images developed by alpinists and topographical mappers from the late eighteenth to the nineteenth centuries, such as those produced by Horace-Bénédict de Saussure and Libre Bardin, as well as the orientation plans for the painted panoramas – invented and patented by Robert Barker – that were given out with the purchase of tickets.

10 Auguste Chevallier, Brevet d'invention no. 3501, Pour des perfectionnements dans les appareils photographiques (18 février 1858), p. 5.

11 Freud 1961, p. 70.

12 Id., p. 71.

13 Id., p. 70–71.

14 The author of the article in which the diagram appeared noted that, «nous aurons donc sur la glace trois images rectilignes qui auront tourné autour d'un point qui leur est commun, l'intersection de la position moyenne avec la ligne d'horizon. En réalité ce n'est pas trois images isolées, mais un série continue d'images». See Crouzet 1901, p. 554. Another later commentator noted that with Chevallier's planchette, «les éléments successifs empiètent nécessairement les une sur les autres». See Laussedat 1901, p. 31. Concern about the superimposition of images was also commented on implicitly and explicitly in contemporary writings on the device.

15 This was further exasperated by the fact that because of the narrow diaphragm used during continuous rotation, the planchette took about fifty minutes to shoot a complete horizon. During this period the lighting and atmospheric conditions often varied to extreme degrees. Thus many of the panoramas demonstrate extreme under- and overexposures, making it even more difficult to identify reference points on the building.

16 E. Paté, *Note du lieutenant Paté sur la planchette photographique* [27 mai 1862]. In fact, both supporters and detractors of the device agreed that the azimuth angles registered on the glass plate were imprecise by at least 5–10 minutes. Often supporters of Chevallier's device put down their inability to achieve a «clean image» to their own ineptitude and not to the intrinsic flaws of the planchette itself.

17 Laussedat 1891, p. 6–7.

18 For example, Colonel Laussedat, a contemporary of Chevallier, developed his own system of topographical photography at the École Polytechnique in Paris. He used a panoramic camera that produced a more traditional series of quadrated, or rectangular, photographs in order to achieve his geometrical plan of a fortress. The extreme legibility of Laussedat's process is striking in comparison with Chevallier's anamorphically distorted photographs of Pierrefonds.

19 O'Connell 1998, p. 139–146.

20 Cavell 1988. There is never any guarantee that certitude will emerge from these acts of deformation and hyperbolization.

21 There are many illustrations in the *Dictionnaire Raisonné* which show broken lines representing the trajectory of sight lines as they emanate out from the towers and parapets of châteaux. See the entries on «Château», vol. 3; and «Tour», vol. 9, in: Viollet-le-Duc 1854–1868.

22 Viollet-le-Duc 1977, p. 2. This is a translation of the section on military architecture in the entry «Architecture» from vol. 1 of the *Dictionnaire raisonné* (Viollet-le-Duc 1854–1868).

23 «Restoration», in: Viollet-le-Duc 1990, p. 216–217.

24 Viollet-le-Duc 1977, p. 29–30.

25 Viollet-le-Duc's explanation, including illustrations, of the chat is found in the following sources: «Architecture (architecture miliatire)», vol. 1; «Château», vol. 3; «Engin», vol. 5; and «Siège», vol. 8, in: Viollet-le-Duc 1854–1868. The chat is also briefly mentioned in Viollet-le-Duc 1874.

26 It was also called a chas-chastels or castel-castellati. See Viollet-le-Duc 1854–1868, «Architecture (architecture militaire)», vol. 1, p. 344, fn. 1.

27 Ibid.

28 Chateaubriand 1996, p. 141, 318–319; Gout 1914, p. 66–67; and Viollet-le-Duc 1902, p. 83. The word for the domestic chat shares the same etymology as the military chat. This etymology is outlined by Chateaubriand 1996, p. 287–288.

29 See Baker 2000, p. 183–190.

30 Leyhausen 1979, p. 189–199.

31 Id., p. 194–195.

32 Deleuze/Guattari 1987, p. 39–74, 149–166, 232–309.

33 There are many points on the château where a curtain wall meets a tower and actually depresses it, as if it were a malleable surface being pushed and prodded by a finger. This malleability is further thematized in the open-air gallery in the courtyard. A decorated keystone shows a figure using a shovel to dig into the stone of Pierrefonds. The shovel seems to enter the surface and flexes in response to the contact. The suppleness that is elaborated in the interior courtyard is part of a larger process of exploring the figural possibilities enabled by this flexible surface.

34 Deleuze/Guattari 1987, p. 160, 507.

35 For an intelligent discussion of perspective and its mythologies see Maynard 1996, p. 23–40.

36 Viollet-le-Duc owned many treatises on perspective and taught courses on it early in his career at the École de dessin in Paris. In particular he seems to have been interested in the «tiers point» technique proposed by Jean Pellerin and later developed by Jean Cousin (he owned books by both). This technique's conflation of distance and viewing point along the flat surface of the support tends to verge towards anamorphic images. It collapses the illusion of distance between viewer, surface support, and horizon. See Massey 1997, p. 1172–1185. L. Brion-Guerry has suggested that the reason why anamorphosis appears so early in France

in the sixteenth century is because «le schéma viatorien est celui qui se prête en effet le plus facilement aux déformations volontaires». See Brion-Guerry 1962, p. 144.

37　Of course Viollet-le-Duc could also draw on contemporary examples of such topological transformation through his understanding of the transformist position in nineteenth-century biology. I develop this in Chapter 3 of my dissertation in relation to Viollet-le-Duc's theory about the origins of art and architectural thinking in monstrosity and imagination, and the plethora of imaginary beasts at Pierrefonds designed and carved according to his drawings and instructions. See Aron Vinegar, «Formosa Deformitas: Towards a Monstrous Architecture», in: Vinegar 2001, p. 112–163.

38　Mohanty 1991, p. 261–272; and Casey 1977, p. 261–272.

39　The philosopher Don Ihde has been exploring a more concrete approach to «eidetic variation» for some time. He applies straightforward phenomenological variational practice to representations and objects in order to explore their «eidetic perceptual possibilities». See Ihde 1977.

40　In 1863 and 1877 respectively, Viollet-le-Duc relied on photographs of Mexican and Russian architecture as the principal source for his analyses without ever visiting the countries in question. He was, in phenomenological terms, bracketing out the referent. See Charnay 1863, and Viollet-le-Duc 1877. His pedagogical books for children published by Hetzel in the 1870s focus on a series of imaginary or fictional buildings, cities, and people that allowed him to explore the implications of his theories without the constraints of 'given' historical circumstances. This is not to say they are uninformed by historical material.

41　At a later date, Auguste Choisy seems to have pushed the logical implications of Viollet-le-Duc's formal experiments at Pierrefonds to their limit: his axonometric rendering of Pierrefonds results in a pared-down geometric, or perhaps diagrammatic, structure completely devoid of any ornament whatsoever. It is as if all the acts of condensation and distortion have distilled the structure down to its most elemental form. See Choisy 1901, vol. 2, p. 460.

42　Viollet-le-Duc 1868, p. 112.

43　Freud also called it «evenly suspended attention». In this mode of analysis the analyst is attuned to his or her own unconscious life in order to better participate in, and draw out, the unconscious life of the analysand. For a succinct definition see Laplanche/Pontalis 1967, «Attention (également) flottante», p. 38–40. A subtle reading of this kind of analysis in relation to anamorphic images is found in Lyotard 1972.

44　The anamorphically distorted photographs hyperbolize the effects of contraction and expansion, revelation and concealment, that are experienced by an actual viewer walking around Pierrefonds. Viollet-le-Duc carefully arranged the building to function as a tool that generates rich 'horizonal' experiences and creates the framing conditions to register those very generations. See Chapter 4 of Vinegar 2001.

45　Viollet-le-Duc 1854–1868, vol. 1, p. 15: «Préface». Variations on this phrase are ubiquitous throughout Viollet-le-Duc's writings.

46　See Leder 1990, p. 34: «the from-to movement of the ecstatic body opens us to reciprocal exchange. I go from my tacit embodiment to a thematically present world.»

47　Cavell 1979, p. 21–23.

48　Mohanty 1991, «Method of Imaginative Variation», p. 264. For a good explanation of Venn diagrams see Shin 1994, p. 5–17.

49　This is a paraphrase of a sentence by Wittgenstein, in: von Wright 1984, p. 7e: «I am not interested in constructing a building, so much as in having a perspicuous view of the foundations of possible buildings.»