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CANYON:
EXPERIMENTS IN DRAWING A LANDSCAPE

02

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ABSTRACT

Canyon *is an experimental design process that extends ideation through drawing via a novel hybrid of hand sketches, soundscapes and virtual reality (VR). The inspiration for the project is the dynamic undersea landscape of Kaikōura Canyon, Aotearoa, New Zealand. The experiment draws atmospheric qualities from the unseen topography and vast body of water of the canyon, recently jolted by huge forces in the 2016 Kaikōura earthquake. The ominous scale and power of this submarine landscape is distilled through multi-modal architectural drawing, merging presences within drawing with those in landscape.*

The early phases of the Canyon *project located a mixed media installation in the Palazzo Bembo for the XVI Venice Biennale. This paper reflects on the capacity for drawing to observe and record intangible presences, augmented by the affordance of VR and spatial soundscapes.* Canyon *also opens up a critique of the traditional view of landscape and its relation to architecture. It alludes to alternative ways in which landscape and architecture might intersect, drawing instead from landscape's intangible, scalar and material presence. The unseen marine canyon landscape is used as a virtual poetic site to provoke and test drawing and experiential techniques; drawing is expanded as a hybrid medium, able to research architectural presences through multiple platforms.*

BIOGRAPHIES

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CANYON: EXPERIMENTS IN DRAWING A LANDSCAPE

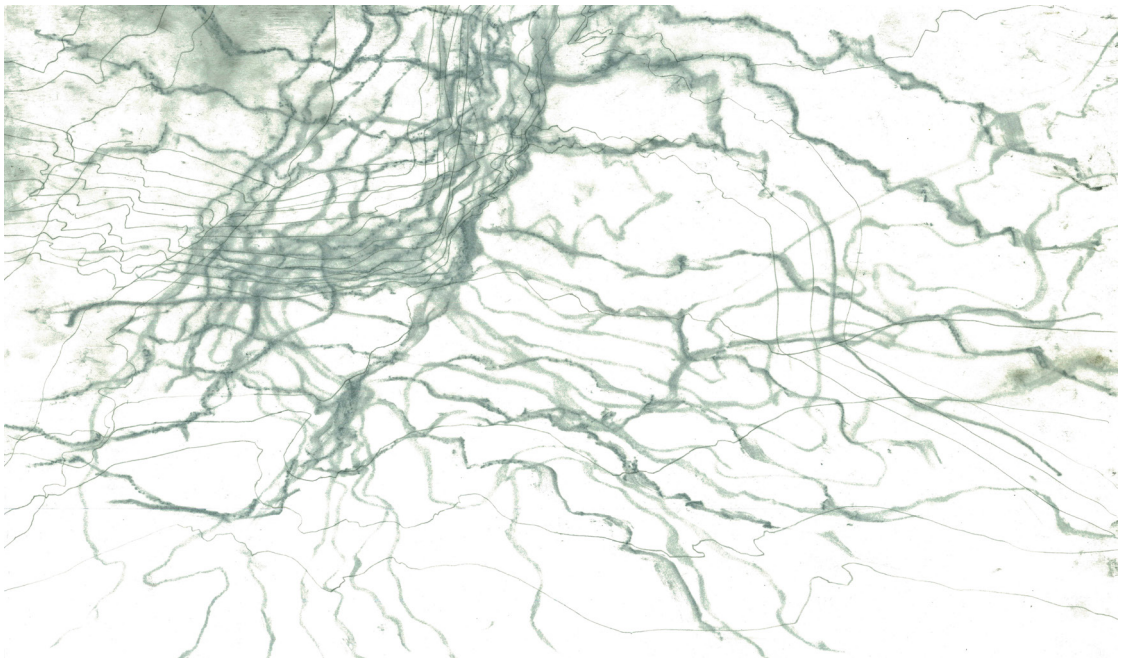
Canyon is the current iteration of a collaborative research project with a focus on drawing, where we are experimenting with a hybrid approach that builds from analogue sketches to explore the affordance of immersive virtual environments and spatialised sound. The theme guiding these experiments is a meditation on imagined landscapes, inspired by the submarine canyon near Kaikōura, Aotearoa, New Zealand. The canyon landscape is not visible beneath the sea surface, yet its presence is palpable; it is a vast and dynamic material entity, with water kilometres deep, figured by seismic jolts, turbid flows, pressures and intensities. *Canyon* imaginatively projects into this unseen landscape through multi-modal drawing; it distils the ominous scale and power of the Kaikōura canyon through evocative graphite sketches, soundscapes and the inherent canyon-like boundlessness of virtual reality (VR). The research follows two threads. The first asks how VR and spatialised sound can be sketch-like, having the open possibilities of a rapidly drawn mark, able to draw out abstract presences through a mix of material, virtual and sensorial modes. The second asks how landscape's abstract presences, drawn out in this way, might inflect architecture, how they might generate a complex shared space between the two. The early *Canyon* drawing research coalesced as a multi-media installation. This paper reports on this initial stage, using it as an armature to discuss ideas and research threads prompted by the *Canyon* drawing project.

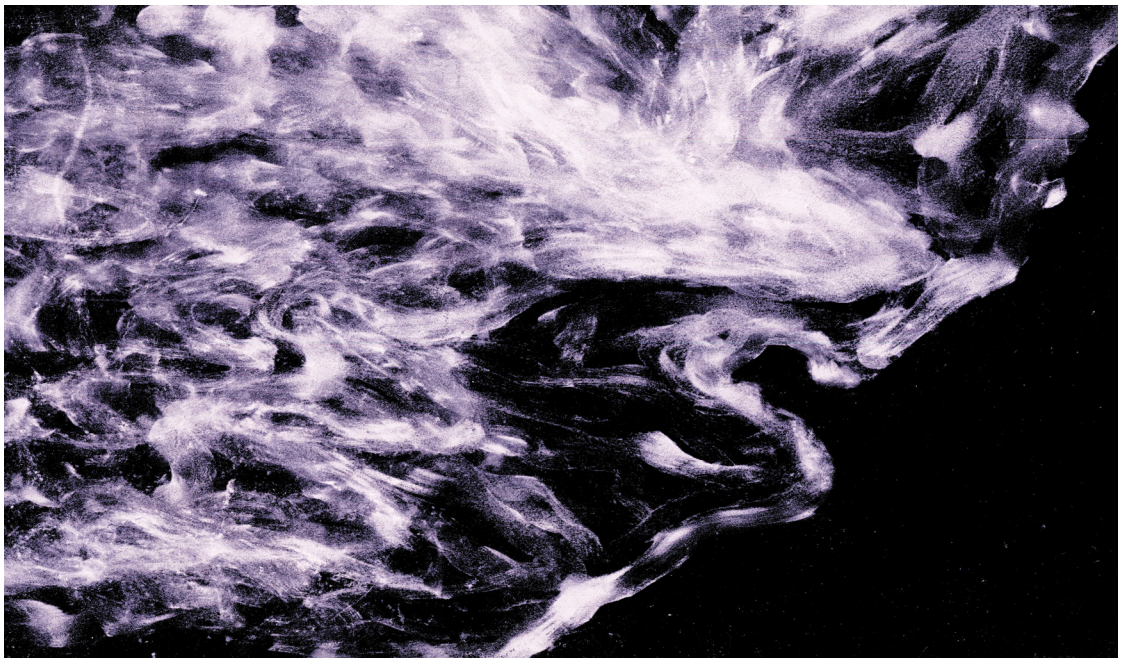
PARATAXIS 01: CANYON INSTALLATION

Canyon was exhibited at Palazzo Bembo, a 15th century building on the Grand Canal in Venice, in an invited group show entitled TIME SPACE EXISTENCE, as part of the XVI Venice Biennale, 2018. The *Canyon* installation was shown in a dedicated room within the Palazzo. Once within the space of *Canyon* viewers became immersed in an inhabitable drawing, projected into a vast, sketched undersea landscape.

The installation was very dark and immersive, with the only light coming from flickering digital images on four small screens dispersed through the space. This light played on the surface of a crumpled black drawing, made from forty metres of black tar-paper. The drawing twisted and contorted within the gallery; it looped back on and around itself to create an enveloping landscape. The drawing's surface was figured by creases and distortions sketched directly in the tar-paper by imagining pressures, intensities and flows in the submarine canyon. The drawing became a dynamic topography that enclosed the viewer, which, along with the low light levels, disguised the boundaries of the space.

Six overlapping soundscapes were crumpled within the space alongside the black drawing. These responded to different conditions of mark making, such as smudge and granularity, and sketched the space of the canyon through sound. The soundscapes passed through the body, or appeared to attenuate in the distance, evoking scale and dynamic mass. Extended low rumblings overlapped sharper, 'pointillist' sounds and occasional loud jolts.





01:
Presence-Drawing Study: Pressures. *From the 'Contour' Series.*

02:
Presence-Drawing Study: Sediment Turbidity (Detail). *From the 'Contour' Series.*

These gave the sense of tumbling submarine rock falls, turbid sediment flows or the canyon's propensity for sudden, seismic rupture. The six soundscapes sketched the canyon in detail, bringing forth abstract, intangible conditions within the submarine landscape and making them appreciable by the body.

Four screens played through fissures located in random places amongst the drawings on the paper surface, prompting participants to move through the installation. The miniature imagery in the screens allowed glimpses into a virtual environment, composed of continuously morphing, abstracted sketches, with each playing scenes from a different virtual location. The images flickered and occasionally flashed brightly, jolting the space in a similar way to the soundscapes. In the full VR environment, when experienced through a headset, participants are swept through an abstract sea of transforming lines and smudges, accompanied by similarly transforming virtual soundscapes. These developed from analogue sketches, made navigable as vast three-dimensional marks. The VR environment sketched flows, smudges, contours and space, in response to the submarine canyon, in an attempt to intensify the abstract presence of the marks and the space they sketch.

The result of these overlapping multi-sensorial sketches is an installation where the visitor is physically present, in a tiny gallery, and also projected into a space of vast scale and dynamic movement, drawn from presences in the Kaikōura Canyon landscape.

PARATAXIS 02: ANALOGUE DRAWING

In *Canyon*, sketches recorded observations of the unseen environment in an attempt to distil abstract presences through gestural marks of graphite on paper. In these crude and rapid drawings, there is a correspondence between the performance of drawing and the performance of the drawings' subject matter: drawing, as a gestural trace across rough paper, was imagined to parallel the dynamics and materiality of the Kaikōura canyon.

The *Canyon* sketches were made by drawing sections, plans and three dimensional 'scenes' over a rock-like surface. The graphite was caused to skip over the paper by the jagged shape of the rock underneath. This skipping allowed unexpected elements to influence the drawing's marks. This was an exaggeration of the feedback normally found in analogue sketching and was used as an analogue of the material dynamics of the canyon; the rock beneath the paper caused the marks to smudge and change direction, so a sectional drawing of the sea floor became not a single line, but an indeterminate series of marks mapping the imagined presence of flows, pressures, mud and rock.

Some of the lines were singular and fine, and described pure boundaries between things, such as at the water's surface. Others described transitions between materials that are less defined, such as where sea water blends into mud then to rock, or where sea cliffs drop vertiginously into an imagined darkness. There were lines that had no material analogue and were merely about directions of current or degrees of pressure or intensity. The drawings, as a set, were not arranged according to different scales but were deliberately mixed, in an attempt to allow ambiguities between scales. The jagged contours of a rock at 1:1 correlated to landscape forms and flows at a larger scale, becaming indistinguishable. The over-arching intention was for the drawings to traverse the imagined space of the canyon, allowing scale and material to be amorphous in order to distil something beyond instrumental description: architectural presences in the canyon.

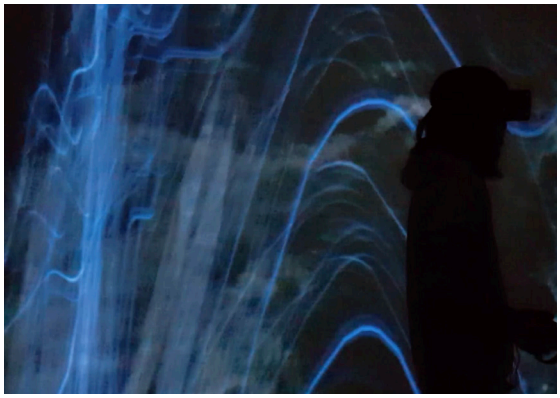
Gestural analogue drawing has traditionally been associated with intangible, qualitative dimensions. Sketches are open: evocative, indeterminate, unfinished, and therefore, full of possibility. Drawing is, to quote Jean Luc Nancy, nascent, "the opening of form."[01] Architectural drawing involves understanding multiple presences. Rapidly drawn lines, smudges and other 'recalcitrant marks', as described by James Elkins,[02] open architectural drawing to possibilities. They are marks where blurrings and unexpected shifts allude not just to descriptions of contours, but intangible, imagined characteristics. They are marks whereby "nuanced misalign¬ments, approximate thoughts and imperfect moments ... resist fixing normative figuration."[03]

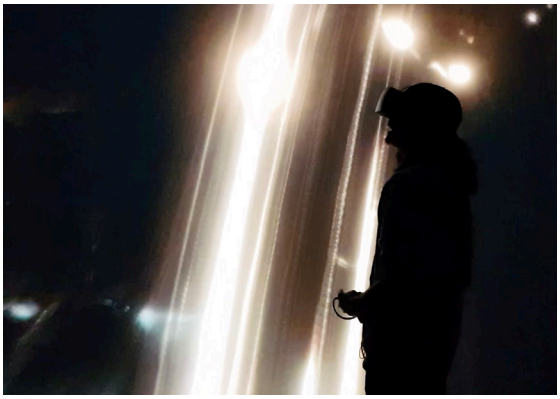
The gestural act of drawing crosses with the performative dynamics of the subject matter. In the case of *Canyon*, this overlaps movements in an undersea landscape with arcs of the hand over paper, creating an exploration of the presences in the canyon at the same time as an exploration of how those presences are drawn. In the *Canyon*









03-22:
Stills from a film documenting experiences of the Canyon VR Experience.












sketches, gestures evidenced by such things as smudges are taken into other media, such as VR and spatialised sound. The installation became a spatial composition of intensified gestures, evidenced by blurs, smudges and recalcitrant marks. These blurred gestural marks speak of a taxonomy of atmospheres imagined in the submarine landscape. Four characteristics of mark were identified that crossed with intangible characteristics of the submarine canyon: *Smudge*, relating to such things as undersea gas eruptions, *Flow*, evoking turbid movements of sediments, which after the 2016 earthquake rumbled hundreds of kilometres into the Hikurangi abyssal river; *Contour*, capturing intensities of water pressure and bathymetry and *Space* which attempted to draw the canyon's vertiginous depth and boundlessness.

The installation prompted the viewer/participant to move, but their movement was not incorporated into the sketch-space in a gestural sense. They inhabited the sketch environment more as sensorial observers to the gestural smudges than as active drawers.[04] The *Canyon* drawing project thus highlights non-linear, indeterminate and tacit modes of discovery. It experiments with pushing these to new limits through testing the intersection of multiple drawing techniques. Analogue drawing is exaggerated as a tool for observing or registering intangible conditions, bringing together multiple real and virtual influences affecting interpretation and conceptual ideation. The *Canyon* analogue sketches emphasise designerly understandings of space, in which knowledge might emerge out of drawing, and whereby drawing is not just as a tool for determining space but as an act of discovery, a way of researching intangible aspects through apparently simple gestural acts.[05]

PARATAXIS 03: VR DRAWING

For architecture, virtual reality has typically been considered another form of visualisation, focusing on photorealism. In a similar vein to the transfer of drawing board practices to early CAD techniques, the tendency is to repeat existing practices without fully exploring and exploiting the affordance of the new medium. The reference point for architects using VR is the use of animation, which, as documented by As and Schodek, has been developed primarily to communicate the kinematic experience of architecture.[06] However, as they discuss, animation practice is conditioned by the traditions of projective geometry that underpin architectural content, and the technical apparatus of the animation camera, which utilises principles of perspective developed in the 16th century. While there are notable examples of architects exploring motion as a conceptual device, such as in the animation of geometric parameters by Greg Lynn or the opportunity for kinetic composition, VR as the 'ultimate display' has had minimal impact on the design process. Most applications have been in the field of virtual heritage with a trajectory towards photorealism, such as the use of high definition graphics and the use of 3D laser scanning.

As outlined above, the trajectory of VR within architecture is towards verisimilitude. In contrast, the approach explored in *Canyon* is a doubling-down of the virtual, prompted by the legacy of openness in architectural drawings. The hand sketches are scanned and transformed in the VR version via procedural shaders, which drift in and out of focus within varying densities of particle systems, camera and lighting effects. The aim is to explore spatial qualities through VR technology, in order for them to be useful in creative ideation, similar to the traditional architectural sketch. For the Venice Biennale installation, the VR world is alluded to through glimpses of screen content, partially revealed through tears in the 40m drawing wrap. The raw physicality of the over-scaled tar-paper drawing provided a visceral spatial experience, at odds with the glimpse of lush digital graphics. The sense is of another boundless space obscured by the heavy tar-paper, a graphically seductive virtual canyon that is fleetingly present, requiring the surveyor to imagine its larger extents.

We might describe the VR aspects of *Canyon* through James J. Gibson's theory of affordance. The concept of affordance has been re-defined and used in a range of domains. This simple definition by Stuckey in relation to the design of virtual environments is the most appropriate for our research; "we use the concept of affordance to refer to the latent possibilities for action presented by an artefact, tool or environment."[07] From this definition and, given the current state of the technology, we propose that as well as immersive visualisation VR affords an immersive sense of kinematics that is more visceral than watching animations on screen. In a similar vein, sound is spatialised and experienced, opening up the, comparatively, underexplored capacity to use aural senses to evoke spatial conditions and materiality. Complementing

immersive kinematics and sound are haptic interfaces that, while at an early stage of development, enable an enhanced bodily experience. Triggering the kinematic, aural and haptic senses—alongside the visual—provides one agenda for the virtual canyon. The second agenda is as important, namely the affordance of the computer to process information in real time. As has been explored through algorithmic and parametric design, this shifts attention away from the discrete architectural representation, and towards manipulating variables within which multiple representations can evolve. Rather than occupying a drawing, we conceive the virtual version of *Canyon* as a procedural machine, that enables a journey through a landscape of possible spatial conditions.

PARATAXIS 04: SOUND DRAWING

The experience of the Venice Biennale installation is as much aural as visual, with an eight-channel spatial soundscape that evokes the vastness of an underwater terrain within the setting of a small exhibition space. The *Canyon* soundscapes are built from two layers of sounds that create an unsettling feeling of motion. Six random, cycling, multichannel extended soundscapes are built from textures with fluctuating detail. Static, smooth sounds rarely appear. Where smooth sounds do occur, they are usually the result of computer processing intended to slow down the spectral evolution of a sound, drawing the listeners' attention to the internal motion of that sound. In other instances, spectral filtering and spatialisation splits off layers of sound that orbit the space. Granular processing further breaks down sounds into smaller spatialised components. Overall there is a sense of being in motion, subsumed by forces perpetually in flux.

The temporal organisation for the *Canyon* sound design can be likened to a mobile slowly turning in the room where the sonic layers are circling or revolving at different cycles. To ensure that the order in which the soundscapes played throughout the day was never repeated, there were six multichannel soundscapes with staggered durations from ten minutes, forty-four seconds to eighteen minutes, ten seconds. These six soundscapes and two silent sections, of fifteen- and thirty-second's duration, were randomly selected and played. One possible reading of the sound design would be to experience this textural motion with the flows of the tar paper, or to connect the tar-paper folds, dents, cavities with an unsettled continuum of forces. From a strictly spatial listening perspective the sound design doesn't provide cues by which the listener can construct a stable reference point. There is no single place in which to stand and experience an acoustic vista, a privileged point where the electro-acoustic environment is 'correctly' delivered.

In the spirit of Umberto Eco's *The Open Work*,[08] or improvising musicians, synchronisation between the sound and digital media here is a feature not a technical problem. This also draws on our experience of gazing at a landscape and the likely occurrence of an event that might capture our awareness. Perhaps we happen to notice a feature, a detail, something connecting two elements. We create a structural connection which becomes a memory of the place. We might just happen to be at the right position, at the right time when a small event, a movement, a change occurs and we imprint a memory of that moment. The asynchronous revolving mobile structure might, or might not, deliver such a memory in *Canyon*. These soundscapes, therefore, are not attempting to transport a listener to an actual location, but to create a setting where imaginative connections might be made between notions of landscape and its influence in drawing, digital design, composition, and digital installation.

OPEN MEDIA

Canyon explores the methodological complexities internal to both acts of designing and the materiality and spatiality of representational media. Drawing in VR commonly involves or is geared toward the production of realistic visualisations, and as such is not often associated with the openness ascribed to what might be considered more traditional forms of drawing, or the generative potential of the sketch. The *Canyon* project brings the open indeterminacy of drawing into VR technology by manipulating the visual acuity of VR space, and prompting a viewer to imaginatively project into it rather than experiencing it passively. This is part of the hybrid approach of the *Canyon* project, which draws together human, digital and material influences in open architectural drawing. The analogue sketch is traditionally dependent on a two-dimensional drawing surface and a representational picture plane. The VR technology prises the sketch away from these limitations and allows the 'mark' to become spatial, to be experienced bodily as well

23:
Kaikoura Canyon Sea Surface. Video Still.

24:
Raised Sea-Floor: Kaikoura Coast.

as imaginatively. A VR sketch environment, such as in *Canyon*, conflates the space of drawing with the spatiality of architecture, making marks, and the subject matter they draw, architectures in their own right. VR, employed in this manner, allows an intense navigation through (a) drawing, where understanding is gained *through* evocative atmospheric immersion, and through understandings framed by the body in space.

In *Canyon*, VR and sound begin to afford possibilities through the presentation of a dynamic sketch-like spatiality, developing theories of affordance (like those put forward by Gibson)[09] and arguments on material feedback as advanced by Sean Pickering,[10] N. Katherine Hayles[11] and Tim Ingold.[12] VR, as a digital material, has the potential to afford or resist the separation of (active) drawer and (passive) participant, and thus generate different understandings contingent upon the role of the individual experiencing the drawing space. In this sense, the VR/sound environment extends the evocative power of a smudged, sketched mark, and with it the potential to generate knowledge through drawing. It opens drawing to more experimental territories. When the blurs and smudges of the sketch are brought into the world of VR and spatialised sound, the analogue drawing's inherent capacity for sketchy openness that contributes to it being an aesthetic 'lens', expands.[13] The material feedback provided becomes more diverse than that of graphite on paper, and consequently the suggestive marks offer a more complex aesthetic lens on that which they draw, allowing nuances to emerge.

The *Canyon* project resonates with the semiotic plurality described in Umberto Eco's *Opera Aperta* (*The Open Work*),[14] but understands *open work* to allude to the vitality of those non-linguistic, non-semiotic undercurrents in architectural practice that largely escape interpretation. It merges ideas of openness inherent in the traditional architectural sketch, with arguments about the power of indeterminacy in art practice (such as that of Sarat Maharaj, who argues for knowledge pursued through art research to be continually ungraspable;[15] of James Elkins, who argues for the power of non-semiotic marks to remain unknowable;[16] or of Jean Luc Nancy, who observes marks in a gestural sketch to be necessarily irresolute, figured by "essential incompleteness, a non-closure or non-totalizing of form"[17]). These arguments suggest a poetic openness, an openness through which one might be able to distil intangible, tacit knowledge.

DRAWING LANDSCAPE

Alongside this inquiry into the poetic capacity of particular media, *Canyon* explores architecture's relation to landscape. *Canyon* attempts to draw presences from an unseen marine landscape and in so doing alludes to ways in which architecture's relationship to landscape can be shifted, reorienting our sense of landscape from the visuality of the picturesque landform to the atmospheric sensibilities of the sea. Landscape and its capacity to trigger the architectural imagination is a significant international theme, particularly for new world architecture. In New Zealand, and Australia, the scale and power of landscape is usually romanticised, reducing landscape to the natural, picturesque setting for an ideal, stand-alone architecture. The *Canyon* project departs from this picturesque tradition by focusing on a landscape that is not visible. It draws intangible, poetic presences from a submarine landscape in order that they might inform architecture, allowing landscape's scale, mass or even its ominous seismic potential to have an architectural impact.

On a small vessel, on a languid sea off the Kaikōura coast, the enormity of the sea is strangely present. Just 500m from the shore the water is over a kilometre deep, and continues to deepen as it flows to the Hikurangi trough, which marks the junction of the Pacific and Australian tectonic plates. Huge forces in this undersea landscape were released in the 7.8 magnitude Kaikōura earthquake in 2016. The seabed lurched upwards, triggering undersea landslides and turbid flows of sediment; the marine landscape, previously unconsidered, suddenly became powerfully evident.

This landscape is known through instrumental descriptions: multi-beam sonic scans, digital models and scientific data, yet less easy to record is its powerful and ominous presence. The landscape, in this sense becomes a dynamic medium with vast mass and complex movements and pressures, latencies and threats. It is not appreciable through vision but through imaginative projection. This inflects the tradition of the picturesque landscape, which is dependent on views of landform. In *Canyon*, the immense body of water and ocean floor are captured through presences, imagined in concert with open marks, intensified through multi-modal drawing.

25:
Photomontage. Canyon VR drawings in a fissure within the installation.

The focus on drawing intangible characteristics from landscape aims to engage with discourse in art history and cultural geography, in which the Picturesque, the Sublime, and affective landscapes are both described and problematised. In this respect, *Canyon* operates in similar modes to other practitioners who look to map tangible and intangible territories, such as James Corner and Perry Kulper in architecture,[18] or in art practice Anselm Kiefer, particularly the *Velimir Chlebnikov and the Sea* paintings in which ominous presences are drawn from a marine landscape. Collectively, these projects draw out intangible presences. Being an experimental proposition, *Canyon* often drifts towards or away from these discourses, and finds itself in new territories. It has tended to move away from representational modes, such as mapping or data visualisation, to engage with the non-representational aspects, or with possibilities afforded by digital creativity. This diverse context allows ideas to be continually open and cross disciplinary, with the possibility that this openness can prompt rethinking of conventions of drawing, as well as the relation between landscape and architecture.

The continued inflection of scale that has emerged through *Canyon*—initially conceived as hand-drawn sketches with scale-less spatial qualities, prior to being installed as a 40m tar-paper drawing that is simultaneously surface and over-scaled mark, a physical space extended through soundscapes that evoke an immensity of scale—suggests a new form of discourse on landscape, relating in particular to the mathematical sublime. The mathematical sublime in nature occurs at instances when our imagination is afforded not so much a greater numerical concept as much as a large unit of measure (foreshortening the numerical series). A tree judged by the height of a person gives, at all events, a standard for a mountain.[19] The Kaikōura submarine canyon defies such a scale measure, beyond the imaginative projection of the depths from its surface. This unknowable scale has, in retrospect, triggered drawings of a spatial condition that is beyond architecture's typical tools of representation. In this short article we offer these opening drawings as avenues for future discussion, within and extending the traditions of the picturesque and the sublime. The atmospheric power of the marine landscape, as something with vast mass and scale—and a latency for movement—provides rich possibilities for architecture. How might we situate these experiments as a way to conceive architecture in this spatiality of boundless, oscillating scalar resonance?

NOTES

01 Nancy, Jean Luc. 2013. *The Pleasure in Drawing*, trans. Philip Armstrong. New York: Fordham University Press, p.1.

02 Elkins, James. 1995. "Marks, Traces, "Traits," Contours, "Orli," and "Splendores": Nonsemiotic Elements in Pictures" in *Critical Inquiry*, Vol. 21, No. 4, p.860.

03 Chard, Nat, and Kulper, Perry. 2014. *Pamphlet Architecture 34: Fathoming the Unfathomable, Archival Ghosts + Paradoxical Shadows*. New York: Princeton Architectural Press, p.63.

04 Another interesting dimension would be added to the research if the participant could actively draw in the installation, and this was considered, but it proved technically complex. It may well be an extension of the research in future, which would allow a complete merging of gestural acts and material feedback from subject matter and drawing media.

05 This ties in with current discussions on the value of design research. Terms such as 'spatial intelligence' allude to design's capacity to make rich non-linear connections. See, for example: Van Schaik, Leon. 2008. *Spatial intelligence: New Futures for Architecture*. Chichester: Hoboken, NJ: Wiley.

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12 Ingold, Tim. 2013. "The Atmosphere" in *Chiasmi International*, Vol 14, pp.75-87.

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14 Eco, Umberto. 1989. *The Open Work*, trans. Anna Cancogni. Cambridge, MA: Harvard University Press.

15 Maharaj, Sarat. 2009. "Know-how and No-how, Stopgap Notes on 'Method' in Visual Art as Knowledge Production" in *Art and Research, a Journal of Ideas Contexts and Methods*, Vol. 2, No. 2, Spring 2009, pp. 1-11.

16 Elkins, James. 1995. "Marks, Traces, "Traits," Contours, "Orli," and "Splendores"... " pp.822-860.

17 Nancy, Jean Luc. 2013. *The Pleasure in Drawing*, p.1.

18 Corner, James. 2011. "The Agency of Mapping: Speculation, Critique and Invention" in Dodge, Martin, Perkins, Chris and Kitchin Rob (eds.). *The Map Reader: Theories of Mapping Practice and Cartographic Representation.* New York: Wiley & Sons, pp.89-101.

19 Kant, Emanuel. "The Estimation of the Magnitude of Natural Things Requisite for the Idea of the Sublime,' in *The Critique of Judgement*, Section A, sub-section 26, trans. James Creed Meredith.

FIGURES

All of the drawings and photographs included in this piece were produced by the authors.

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