Novel Perceptual Phenomena in Reading Mutable Inscription Systems

Scholarly investigations in readability often examine digital literature through the lens of orthography and conventional translation practices. Similarly, explorations on untranslatability and readability hinge on the cultural framing and cognitive processes that demarcate the semiotic boundaries of literary works. Building on these critical trajectories, this article posits that electronic literature that manifest novel perceptual phenomena in the act of reading also create unique opportunities for writers to modulate readability as part of expressive intent. Combined with other remarkable attributes of electronic literature, inscription surfaces that sophisticate the perceptual aspect of reading fuse emergent and traditional conventions of writing. The following treatment considers viewer perception, along with materiality of these particular inscription systems, in translanguaging, untranslatability, and readability.

Seær is a new media text delivery system that uses sculpture, custom software, and laser projection to hybridize conventional and asemic writing. *Seær* seeks to extend and augment a specific experiential moment in the act of reading, when persistent marks transition from non-language to language. In writings that employ *Seær*, the viewer is prompted to question their perceptual impressions, and consider the multiple linguistic registers that exist between the iconic and the symbolic.

In presenting *Seær,* the article outlines a writer's motivations when composing for experimental forms of aesthetic linguistic practice. In asemic writing — where visual forms possess no semantic value or content — readers are left free to interpret the writerly gestures, and fill the voids of meaning. By employing Seær's ability to induce certain perceptual cues, a writer can then delay, extend, reverse, and manifest John Cayley's notion of the 'catastrophic

moment' using animated graphemes that dance on the edge of readability or translatability. As a result, a practitioner of the language arts can then generate asemic writing with a finer degree of expressive control.

Introduction

Recent investigations by poet and theorist John Cayley have been concerned with the philosophy of language and writing practice that is problematized by programmable media. Cayley argues that language ontologically stands apart from its supporting medium, and that language is constituted fundamentally through the act of reading (Cayley 2019). This position is remarkable, given Cayley's work (e.g., *overboard* and *translation)* and his critical treatments of complex inscription surfaces that yield more than one functioning dimensional presentation of text (Cayley 2005). Irrespective of the multiplicity of forms that arise from digitally-mediated literary practice, Cayley cites the act of auralizing text as, among other things, a key differentiating aspect in the reading experience. This aural recitation of text is a feature that defines language-driven symbolic representation as distinct from other visual depictions, as in imagery. One might surmise that the ability to parse graphemes as auralized text leads to discrete registers of engagement with language-driven work. In our examination, we shall explore the discreteness of these engagement registers as one of two notable facets of readability.

In "Untranslatability and Readability," John Cayley describes an experience unique to the reading of asemic literature, such as in the unreadable *Book from the Sky* by Chinese contemporary artist Xu Bing. Cayley makes the case for the 'catastrophic moment':

> The catastrophe is, of course, the moment of the reader's personal realization—or the reader's acceptance of another's exposition—that *Book from the Sky* is unreadable, untranslatable. Once this catastrophe has occurred for a reader, they cannot turn back. Whatever they may experience of the work subsequently, in terms of being moved, impressed, if not awed, by its material cultural and aesthetic presences, 'readers' of the work are nonetheless required, henceforth and perpetually, to be simultaneously confronted with the evacuation of any possibility of encounter with any event of language that might once seem to have been embodied in the work.

It would seem then that such a realization would discourage the reader from any further attempts to extract semantic value from the graphemes, however such markings are presented in asemic literature. The catastrophic moment signals the death of any potential literary engagement with the work. It is a salient instrument that practitioners in language-driven work should wield with purpose. The catastrophic turn is the second notable consideration in our discussion of readability.

Seær: A Novel Method of Text Delivery

Other language-driven, new media works may have fleeting instants that begin to explore boundary points of signification. Seær allows the viewer to inhabit that liminal space instead; the viewer experiences the boundary point as continuum rather than as a switching point between two distinct states. Seær mixes asemic writing with traditional writing, as the content slips between and leaps back and forth from non-specific to legible.

Seær couples new technologies (laser projection, custom software) with immutable materials (stone and stone-like surfaces) to investigate, creatively, textual materiality. With Seær, the author is able to shift meaning more fluidly and with finer granularity than that afforded by the word, the letter, the stroke -- the archetypal or conventional atoms of expressivity in written language.

In this way, Seær seeks to rehearse the advent of writing itself (as the petrograph once did, preserving gestures of articulation from memory via markings on stone), but through a polemical instantiation using new media technologies. More specifically, the project considers questions that investigate what is at stake in the act of signification, when language driven work is delivered using seemingly static -- but in fact, very mutable -- physical substrates. How does meaning shift as graphemes slip between random mark, to patterned image, to letter and word, and back again? How does a reader's expectation of lasting permanence affect the reading of word and image when its state of being is made transient instead? These and other questions reveal the affordances of this specific combination of technologies and method of textual delivery, and the potential impact on the way we read and write literature delivered with new media systems.

The Seær system incorporates a number of components and tools: an array of stone-like panels that can be installed in different configurations to provide a textured projection surface; custom software written in an open source programming language and integrated development environment called Processing; a number of industry standard digital tools such as Adobe Photoshop and Pangolin Beyond; and laser projection. We can organize these components into three categories: the sculptural surface, the hardware, and the software tools.

Figure 1: *Detail, depicting the stone-like texture of the Seær sculpture*

The sculptural surface was fashioned from extruded foam that was shaped, coated with sand, and then painted in multiple stages. In all, twelve front panels measuring six feet by four feet, along with six side panels measuring 4 feet by eight inches, were fabricated and mounted on canvas frames. Whereas the front panels provided a relatively flat, uniform surface on which text and image can be inscribed, the side panels were fabricated specifically to evoke association of naturally occurring stone. Seær's surface can be deployed as a sixteen foot by eighteen foot flat sculpture, or in many smaller three-dimensional configurations. Seær debuted with nine panels to form a twelve foot by twelve foot sculpture made to resemble a stone monument (see Figure 1).

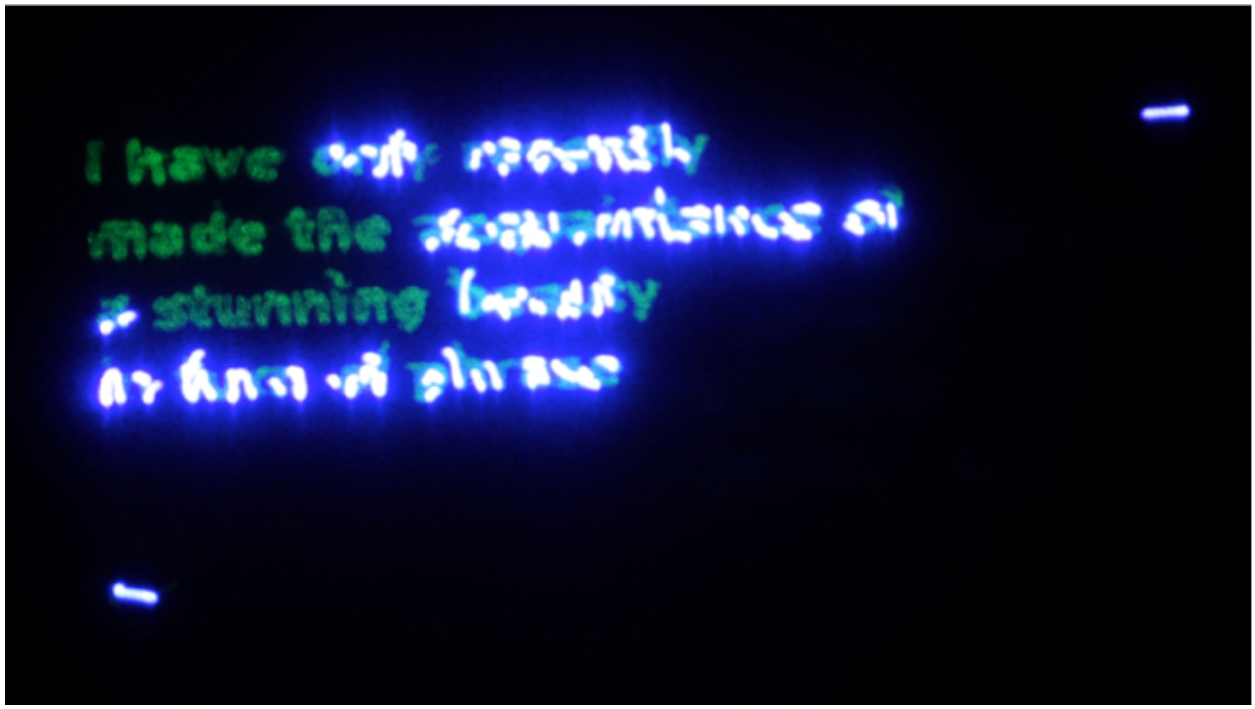

Figure 2: *447nm laser beam activating the phosphorescent pigment*

The top coat of the sculptural surface is impregnated with a phosphorescent pigment that glows when exposed to near-UV light, and can be actuated using light emitting hardware (see Figure 2). A 447nm laser beam, emitted from a projector unit and directed with 30K dual axis galvanometer based optical scanners, excites the pigment. The laser beam's movements can be finely controlled by a computer via the ILDA protocol (a control standard specified by the International Laser Display Association). The computer was connected to the laser projector unit using a proprietary hardware interface, the Flashback3 FB3-QS, which was designed specifically to work with prepackaged software specialized for controlling laser light shows.

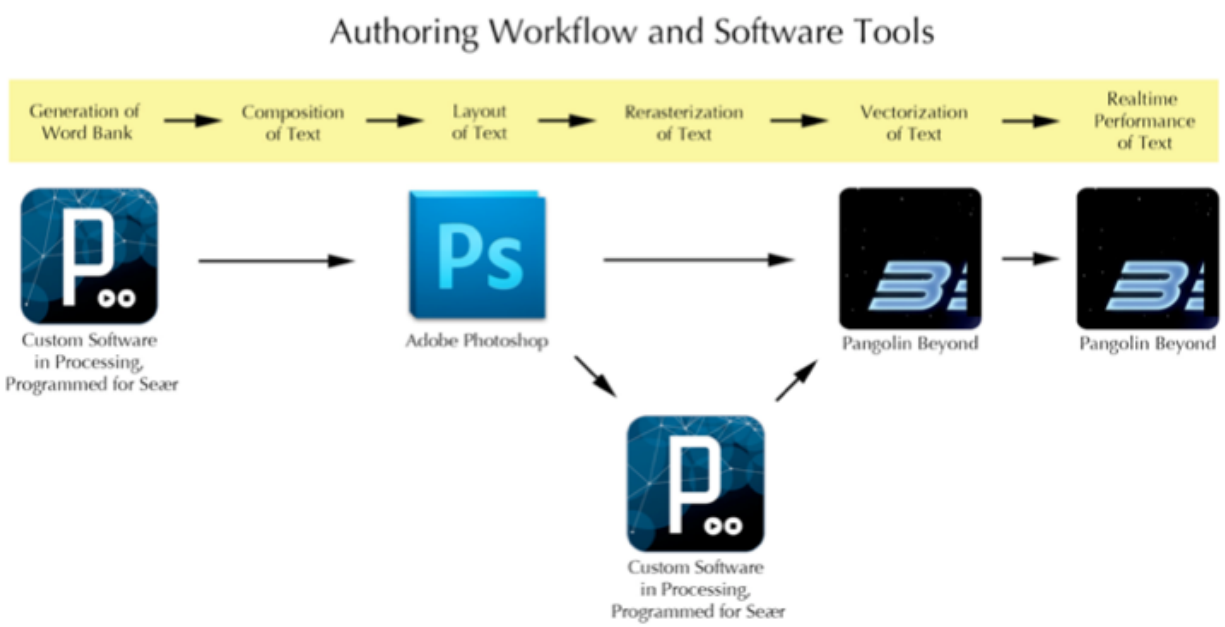

Figure 3: *Authoring Workflow and Software Tools*

The software tools included a range of readily available payware as well as custom written software to enable various steps in the authoring workflow, illustrated in Figure 3. Custom software was programmed in Processing to search for words that are graphemically similar, e.g. the words “retrain” and “refrain.” After text has been composed for Seær, the writing is laid out in Photoshop. Special attention was paid to the spatial arrangement of text so that when the words are being inscribed by the laser, certain letters (as in the letter “t” in “retrain”) overlap over those of previously inscribed words (over the letter “f” in “refrain”), essentially transmuting the word. Photoshop techniques for manipulating the overall value (how light or how dark) and creating shadow gradients were also employed to yield different outcomes when the text is later vectorized in the laser control software, Pangolin Beyond.

Composing for Seær

When the viewer witnesses the laser tracing each grapheme, the bright glow induces *palinopsia*. The viewer perceives afterimages – Seær graphemes that continue to persist in their vision – readily apparent when one blinks or closes their eyes. These afterimages offer potential for additional layers of symbolic representation. At times, these afterimage graphemes are legible, while other times they are illegible marks that coalesce with other ephemora on the glowing substrate of the Seær sculpture. These marks become inkblots inviting reader interpretation. As these marks interact with the reader's memory of previously viewed graphemes, the viewer may begin to fill the semantic voids with their own interpretations of meaning – a sort of literary confabulation. The presentation of novel perceptual phenomena to induce unique experiential moments in the reading experience is significant in our investigation of readability, in that the unit of expressivity can become more granular. As words and image are blended and fused, the registers of literary engagement in language-driven works might become less discrete, as in the examples identified below.

Mixing Asemic and Legible Writing

Writing for Seær necessitates composing text for transience, that the composed text and the related obfuscated markings will be perceptually distinguishable for only a short period of time. Additionally, because Seær permits the writer finer granularity in iterating through the various levels of legibility as part of a performance of inscription, the essence and thrust of a poem's meaning can be made to shift in trajectory, modulating the poem's meaning by way of modulating legibility. When writing for Seær, secondary and tertiary interpretations can be elicited by obfuscating certain words while emphasizing others, and maintaining line lengths through the use of placeholder markings, a practice referred to as *greeking* text. When

composing for Seær, the use of greeking techniques indicates that the traditional conventions of writing underpins authorship for this inscription surface.

For instance, in one poem about a writer's love affair with 'turn of phrase', the last stanza acknowledges the unique reading experience of the viewer of Seær:

> when epiphany, suddenly
> her after image remains
> and I am once again,
> alone and ill-equipped
> with wordly muse,
> no longer.

The stanza was visually composed with the following emphasis on certain words:

> / / / / epiphany, / / / / / / / /
> / / / / / / / / image remains
> / / / I am / / / / / / / / / /
> alone / / / / / / / / / / / / / / /
> with / / / / / / muse /
> no / / / / / /

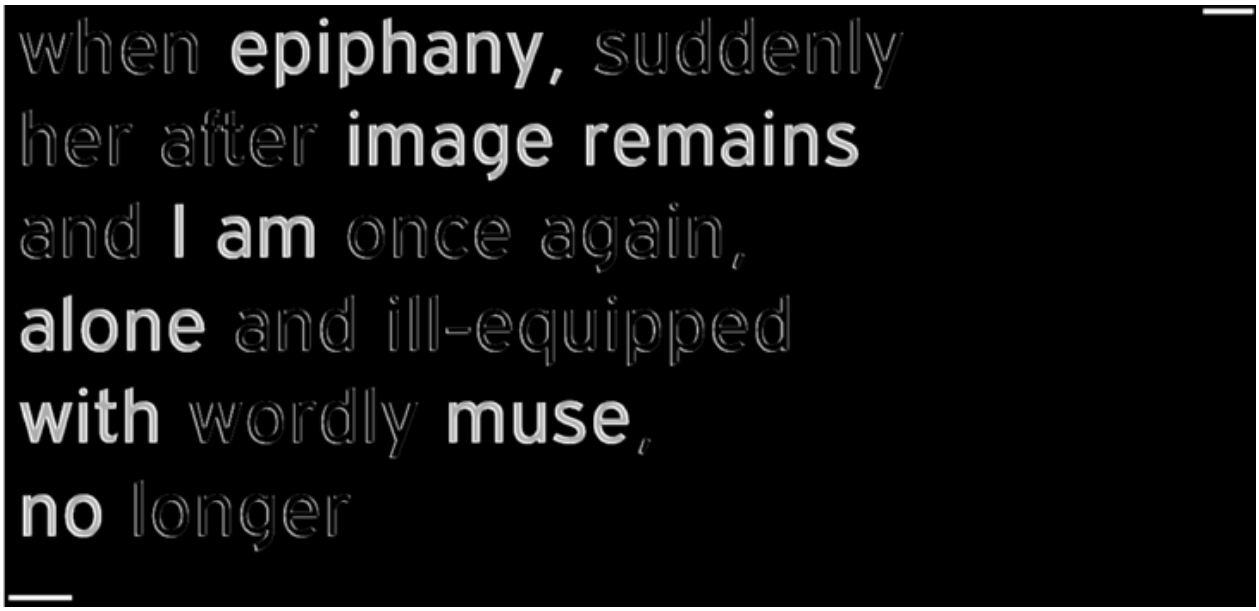

Figure 4: *Photoshop techniques emphasize certain words in visual composition*

The generated image in Figure 4 depicts the emphasis placed on certain words when it was laid out using Adobe Photoshop. The darker words, e.g. the words “when” and “suddenly,” become abstractions when displayed using Seær: unintelligible asemic markings that have no specific semantic substance. Three select moments in the range of possible Seær permutations are documented in Figures 5, 6 and 7.

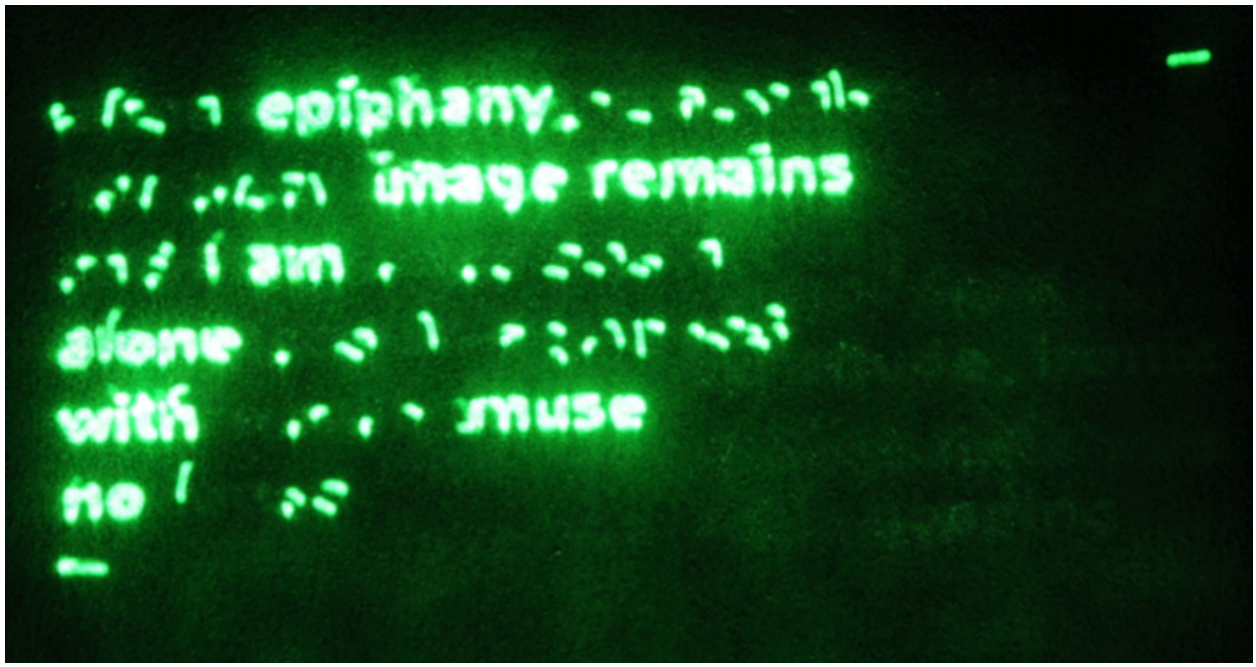

Figure 5: *Asemic writing appears alongside clear and legible text*

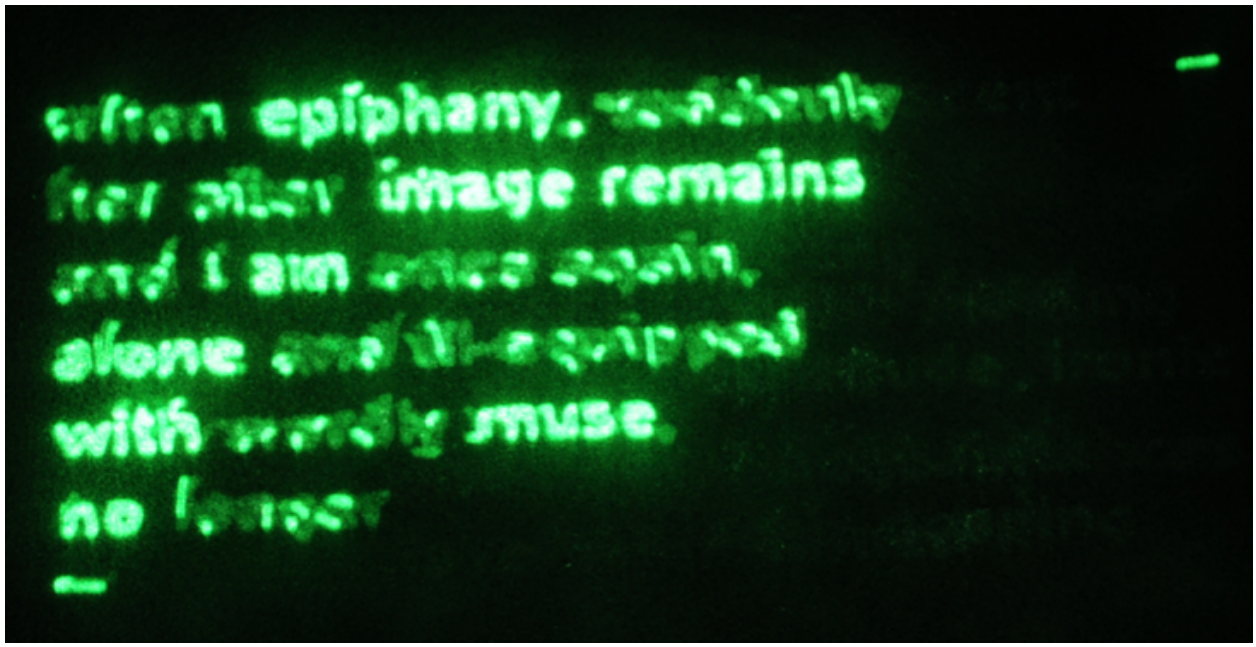

Figure 6: *Random markings continue to obfuscate*

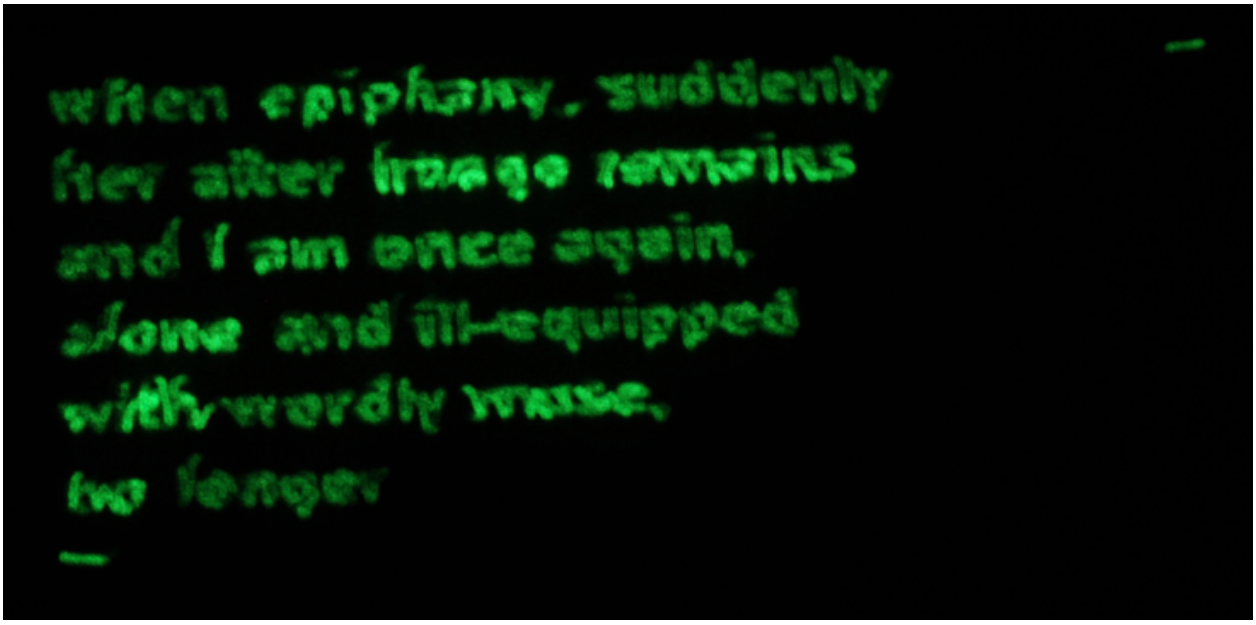

Figure 7: *Certain words are closer to legibility.*

Graphically similar words

Words that are similar in the way that they are inscribed but whose meanings are remarkably different offer potential when composing for Seær. For instance, the letters “t” and “f” are typographically very similar, and the words “detection,” versus “defection,” have different meanings. As seed words, “detection” and “defection” are potentially compatible ideas for use in the same narrative or poem.

Word pairs that are presented side-by-side, such as:

ballot ballet

versus

ballet ballot

might depict a visual poesis as the letters “e” and “o” swap places in a typographic dance when presented through Seær. Other examples of graphemically similar words that demonstrate promise are depicted in Table 1.

Table 1: *samples of graphically similar words*

seed words	one-liners	transformations	2 and 3-word narratives
ample amble creaking breaking croaking sons eons cons sops sobs defer deter detection defection duels duets exiled exited formal format fumbled tumbled jumbled herd nerd hard hero	banged hanged banker canker bakes cakes ballot ballet pallet ballot pale bale	atop stop atone alone stone slum alum ashes aches affluent effluent auction suction auspicious suspicious avocation evocation pegged bogged bagged	hearing nearing beating been peep pending bonding banding pill hill

The sample words in Table 1 were algorithmically harvested through custom written software programmed in Processing to sift through a 35,000-word lexicon for entries that are graphically alike.

Cross-sensory tropes and metaphors

The Seær system enables the use of figurative devices that cross sensory lines as well. The debut of Seær entailed performance of text that invoked patriotic allusions. Although no overt or literal reference to American symbolism in either the orally delivered prose or in the visually delivered writing was made, viewers have reported seeing the U.S. flag in the layering

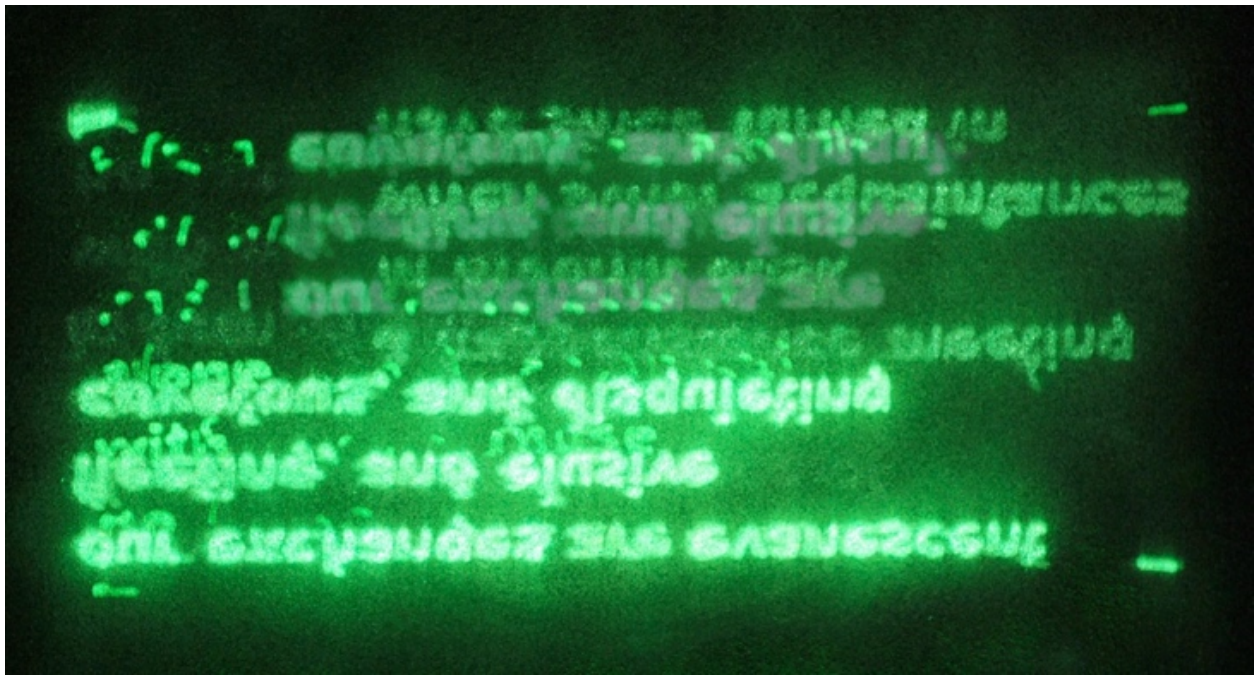

Figure 8: *Viewers reported seeing the U.S. Flag in the layered markings.*

of the text (between afterimages in their vision caused by the laser, as well as the phosphorescent afterimage on Seær's sculptural surface), as simulated in Figure 8. This interpretation of visual phenomena was framed in part by the schema of commemoration that was employed in the narrative. It is this confluence of factors -- the blending of asemic and legible text coupled with the viewer's memory of inscription that has already transpired -- that make Seær's combined use of phosphorescent after-images and laser inscription unique.

Geometric Transformations of Text

The geometric transformation of text, such as the scaling or rotation of graphemes (as in the use of upside-down numbers with letters) is, perhaps, not a technique that is entirely dissimilar from methods of composition already described above. However, while the mixing of inscrutable and legible inscription has already been discussed, what has not yet been considered

is the mixing of transformed and non-transfigured text. Text that remains entirely legible but is selectively transformed, or alternatively, text that can be read in another orientation (e.g., ambigrams) might be further extended with Seær's method of presentation. In this way, Seær enables the visual form to enact its content, creating moments when the visual-grammar and linguistic-grammar are inextricable.

Linguistic Evolution and Reader's Perception of Time

Seær's display system allows an intuitive depiction of linguistic evolution that relies on: a) the perception of fading text and the resultant expectation that the inscription is transient; b) the reader's memory of previously inscribed text; and c) the passage of time. For instance, the Filipino word "bundok," which means "mountain," is a colloquialism that refers to rural geography. The term "boondocks" is an American word with a similar meaning. Thus, the morphing of bundok to boondock in a narrative displayed through Seær might suggest a lingual relationship that can allude to the evolution of the word as a result of the American military presence of the Philippines in the 20th century without explicitly referencing it. Similarly, another example is a work that morphs between the three sets of markings found on the Rosetta stone using the display processes of the Seær system, visually depicting the grapheme relationships between the three writing systems represented on this stone.

Conclusion

Through a series of literary works using the Seær system, the continued exploration of inscription surfaces and the impact that the materiality of these experimental surfaces has on experimental writing suggests new opportunities for authorship. As words and image are

hybridized, the registers of literary engagement in language-driven works become less discrete. Animated graphemes that play with reader memory, coupled with palinopsia, allow writers for Seær to temporize or even reverse Cayley's catastrophic moment.

Such exploration greatly informs the processes and practice of writing and reading using digital media, particularly when inscription systems integrate other perceptual and feedback systems – e.g., the reader's vestibular sense and proprioception when text is delivered using virtual reality masks, or neural oscillations when using brain-computer interfaces. The dimension of permanence versus transience will serve a more prominent role in future forms of textual delivery: in the way that the content of e-newspapers might change as you unfold it, or perhaps when the walls and the windows of residences might be one and the same -- displaying text at some moments and then permitting inhabitants to view the environment outside in other moments -- the reading of hybrid traditional and asemic writing systems will become commonplace and unremarkable. Such inscription surfaces will be regarded as more inherently mutable than they are perceived to be today. Similarly, unique perceptual phenomena will become a more prominent dimension in both the acts of composition and writing of text for such new media delivery systems.

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