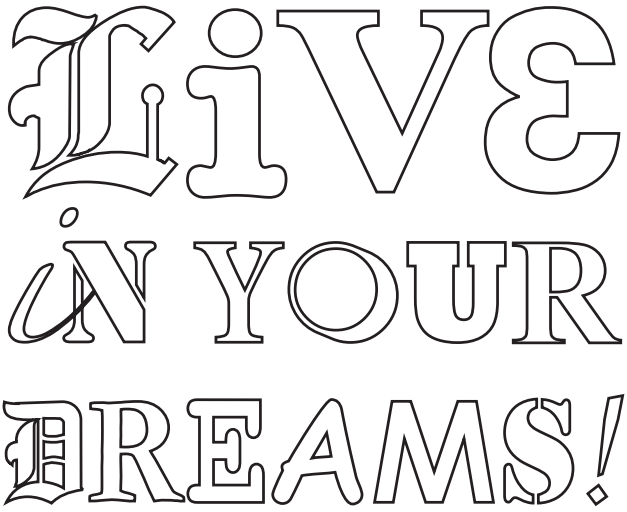
LIVE
IN YOUR
DREAMS!

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The Crypt of St Pancras Parish Church, London
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THE ARTIST'S UNDERWORLD

Stéphane Verlet-Bottéro

The area running between London's Euston station and King's Cross station is one of the busiest districts in Europe. Beneath this hustle and bustle lies the crypt of St Pancras Parish Church, a space that harbours a peculiar silence – the architectural Other of the restless city above. Contiguous, yet antagonistic. Bound to the urban landscape, yet sealed and concealed from it. The exterior law seems redundant here.

I had long been fascinated by this 'down below' space, a marginal zone concurrently embedded with qualities of centrality and remoteness, accessibility and displacement; a realm of otherworldly absence. It occurred to me that this feeling underpinned the generation of a broader metaphor. While the metropolitan aboveground resembles the conscious activity of a restless subject obsessed with rational efficacy and unfaltering productivity, the subterranean vault could be thought as the locus of an ineffable.

Thus began the idea of an exhibition exploiting this transitional space as a receptacle for projective interventions by artists from all disciplines, in which the polarities of light and darkness, motion and seclusion, regulation and freedom, might be explored. The crypt thus becomes a formal site of the unconscious; a structure manifest through dreams. I could not avoid recalling Bachelard's image of the cellar in *The Poetics of Space*, that 'dark entity of the house, the one that partakes of subterranean forces' [1]. In the house of our soul the old cellar is where we go to dream, our memory loosening in its depth. The crypt is not just a cave, a mere hole in the ground. It has a specific architecture and fulfils ritual functions. So works our unconscious: distinctively structured, it manifests via specific processes.

While studying hysteria under Jean-Martin Charcot at the Salpêtrière Hospital in Paris, Sigmund Freud came to understand that the unconscious mind could be revealed by way of free association and interpretation of his patient's dreams. Freud's work led to the notion of the repressed unconscious that formed the bedrock of psychodynamic theory – not merely the suppression of unpleasant memories, but also the rejection (*Verwerfung*) of fundamentally traumatic experiences linked to unbearable social, material or sexual circumstances. In this perspective, it is interesting to note that long after it served for burials from 1822 to 1855, the crypt of St Pancras was used as an air raid shelter during both world wars and is thus historically tied to the atrocities of those times. The sepulchral vault houses a vast ensemble of memories, many forever irretrievable.

The crypt, then, might be conceived of as an underground artistic laboratory in which

dreams are used to conjure the repressed and transfigure the external order. The symbolic association between the unconscious and the depths dates well before Bachelard's image of the cellar. While a detailed history of the recurring image of the psyche's underworld would exceed the scope of this essay, I will briefly summarise some of its most fruitful instances.

The Orphic metaphor

The idea of a deep region of the soul can be traced back to the birth of written language. In ancient Mesopotamia, where urban civilisation and writing originated, dream accounts have been found on cuneiform tablets dating from as early as the last quarter of the 3rd millennium BC. Not only did the Sumerians transcribe their dreams, they also practised sophisticated interpretative methods to analyse their meaning according to the dreamer's individuality.

The myth of Inanna, the Sumerian goddess of Heaven and Earth, relates an archetypal allegory of spiritual initiation and psychology of the soul. In the text *The Descent of Inanna* (c. 1900-1600 BC)[2], Inanna descends to visit her sister Ereshkigal, queen of the underworld, for the funerals of her husband. As Inanna walks through the seven gates of the frightful underworld, piece by piece her clothing and her earthly possessions are removed from her, leaving her naked and powerless to confront Ereshkigal. Ereshkigal has Inanna hung on a hook. Seeing that she doesn't come back, Inanna's minister Ninshubur calls to the gods for help. Enki, god of wisdom, answers the call. Inanna comes back to life and returns to the upper world, and the fertility of Earth is restored. Joseph Campbell interpreted this myth of cyclical nature and continuity of life and death as a descent into the unconscious: the experience of powerlessness is an acknowledgement of unspeakable forces that we must not ignore, and that we can learn to tame and work with, in order to sustain our conscious life in greater harmony[3]. The painful situation of Ereshkigal, whose husband has died, and the symbolism of Inanna's descent suggest a wound to the conscious ideal representation of the self caused by the repression of a delitescent knowledge that counsels us on the necessity to face repressed trauma by de-identifying with the ego and waiving defence mechanisms.

The mytheme of the descent is to be found in almost all mythologies. Good examples are the resurrection of Osiris as god of the underworld, the quest of Orpheus to rescue Eurydice, or Dante's saga to the *Inferno*. Carl Jung, who drew a great deal from myths and religions in order to to generalise Freud's ideas into a theory of archetypes and collective unconscious, conceptualised the process of delving into the soul using the term *nekyia*, in reference to Ulysses' journey to the Halls of Hades in the eleventh book of the *Odyssey*. In Jungian psychology, *nekyia* or the voyage to the lower regions of the self, is necessary to achieve individuation.

Turning against the Enlightenment's fixation on reason, the Romantics sought to explore the vast territories of the mind's dark side and discovered, one century before Freud, that it too had a structure. German poets illustrated the distinction between the conscious and the unconscious by juxtaposing the worlds of the organic and the inorganic. Their dualities are mediated by the realm of metals, which form in the depths of the Earth, not completely organic yet not completely mineral. Here, the mine appears as the Romantic's metaphor of choice for the unconscious. This philosophy of nature and the soul was, for the most part, the work of a number of writers who had been trained as mining engineers, most notably the visionary Novalis whose father was director of the salt mines of Saxony. Novalis studied geology and mining at the Mining Academy of Freiberg from 1797 to 1799, and worked until his death as inspector of the mines. He developed a mineralistic philosophy that found favour among his circle of friends, poets and fellow students of the Freiberg Academy. In his novel *Heinrich von Ofterdingen* (1802), the protagonist is led on an journey of initiation in which he encounters all sorts of characters. In particular, he meets with a miner who tells him about a mysterious place, feared by villagers, to be found under a hill. Together they set out on an expedition underground and discover halls full of symbolic objects, from bones to a subterranean library regularly visited by an old scholar. Heinrich finds himself pictured in some of the books. In this Orphic representation of the depths of the mind, a productive activity takes place. The mine has an internal rhythm and follows specific functional rules. The mine is full of life and vibrant mysteries. For the German Romantics, the ritual of descending into its depths is a way to retrieve the treasures of the least familiar regions of the soul.

In Dostoevsky's novel *Notes from Underground* (1864), the unnamed narrator – the Underground Man – claims to be writing from a dark and filthy cellar, a space that symbolises the dissociation between his inner psychology and the outside society. The relationship is ambiguous: the Underground Man feels rejected by the world above, but he also prefers to live in his own underworld, where he has made his home for forty years. Mikhail Bakhtin has pointed out that the personality of the narrator undergoes a constant dialogic process in which his discursive self and struggle for individuality are inextricably bound to what he perceives others to think of him. The Underground Man reveals his troubled psyche through a mode of a quasi-psychoanalytical conversation with the reader, tracing his fears back to childhood traumas using a narrative style that evokes free association: 'I don't wish to be hampered by any restrictions in the compilation of my notes. I shall not attempt any system or method. I will jot things down as I remember them'[4]. Anticipating Freud and existentialism (Sartre acknowledged the influence of this novel), Dostoevsky creates the portrait of a complex human psyche, using the image of the cellar as the scenery of its analytical introspection, a backdrop that facilitates the recollection of repressed thoughts.

Freud remained faithful to the image of a subterranean world beneath that of the conscious, opening *The Interpretation of Dreams* (1900) with Virgil's verse on the infernal river Acheron of the underworld ('If I cannot bend the Higher Powers, I will move the Infernal regions'). Furthermore, his recurring archaeological metaphor underlines psychoanalysis's concern with unearthing the past, recomposing fragments and interpreting reconstructions. An obsessional collector of Egyptian, Greek, Roman and Buddhist antiquities, Freud compared the psychic mechanism to a process of stratification, and the work of the psychoanalyst to that of an explorer equipped with picks and shovels to uncover ruins and tablets with half-effaced inscriptions.

For Jung, Freud's disciple until their relationship deteriorated when Jung criticised Freud's theory of the unconscious, its emphasis on sexual drives and its limitation to repressed motivations that failed to consider its potential as a source of creativity, the dialectics of the aboveground and the belowground lies at the heart of attempts to understand the human psyche. Jung regards as seminal a dream he had in 1909 when traveling back from America with Freud – a significance which was said to be exaggerated by Jung throughout his life in order to differentiate his work from Freud's. Jung related the dream many times in his written work[5], which makes it difficult to locate its original content. In this dream, Jung explores a house with two storeys, starting with the upper storey arranged in fine 18th century style and with which he identifies himself. Moving down to the ground floor he finds richly decorated rooms filled with Renaissance ornaments and medieval furnishings. Below is a 'beautifully vaulted room which looks exceedingly ancient' and which, judging by the brickwork, seems to date from Roman times. Lifting a slab in the floor, he finds a 'stairway of narrow stone steps leading down into the depths'. Descending to the low cave, he discovers 'remains of a primitive culture' and two human skulls. Jung later associated this vision with the priest's house of the Basel Cathedral, which was owned by his uncle and had a dark, cave-like cellar. In 1960, excavations had revealed that the house was built on Roman foundations and underneath was a lower cave, a meaningful fact for Jung. To him, the house represented an image of the evolutionarily stratified psyche. The regression through different levels of consciousness down to that of primitive man, buried deep in the unconscious, illustrated the hereditary deposit of ancestral experiences. In particular the two skulls would symbolically reflect the archetypal unity of father and mother, masculine and feminine. It was years after this metaphorical crystallisation of the questions he was exploring at the time took place, that Jung coined the term 'collective unconscious', but he repeatedly recounted the dream to assert his discovery of archetypes and symbol formation.

Returning to Bachelard, the metaphor of the crypt as an oneiric space is closely associated with childhood and dream-memories 'lost in the shadow of a beyond of the real past'[6]. In the depths of irrationality inhabit fearful forces: 'buried madness, walled-

in tragedy'. But secret passages accessible to the knowledgeable dreamer enable some communication with the realms of rationality, as seen in the Sumerian myth of Inanna, in the Romantic image of the wandering miner, and in Jung's descent into the primitive cave (which Bachelard cites as an inspiration for his poetic phenomenology of the house-as-soul). This particular room of the house is inseparable from a notion of movement, of journey. The crypt is the space of spiritual depth that we return to, both literally and in dreams, after years of absence. One function of poetry, and art, is thus to recover the tale and the specific conditions of such dreamt odyssey. In that sense, 'dream is more powerful than thought' and art distinguishes itself from psychoanalysis in that it retains, or restores, in its material instance, the unfathomable event from which it originates, locating pure sublimation entirely in the exalting reality of form.

Dream cryptograhy

The enduring image of the subterranean space with its distinct order and specific functioning upholds the idea that Freud's theory of the unconscious can only be metaphorical – a metaphorical conceptualization of the experience of the ineffable registered and then rejected throughout the history of individualization. Among the voices reasserting this metaphoricity, Donald Spence has underlined the cultural references to totalizing narratives and mythological stories of the human psyche on which many psychoanalytical theories are based[7].

Considering the allegoric power of the 'oneiric depths', what has been and what can be the relationship between art and psychoanalysis? Without going into the details of a well documented history, let us be reminded that before Freud, as he recognized himself[8], Romanticism had already grasped the other side of reason by tying together introspective poetry, philosophy and, in the writings that interest us here, a metaphorical scientific impulse drawing from geology and mine engineering. Georges Didi-Huberman has accurately traced the interwoven history of late nineteenth century psychiatry and photography[9]. Freud's mentor Charcot, an amateur painter as well as neurologist at the Salpetriere hospital, had methodically photographed his hysterical patients, not without a certain sense of performance, as might be witnessed in the case of Augustine, one of his favourite patients. What Freud himself brought to the understanding of art and the ensuing possibilities for the creative process was an appreciation of the value of interpretative methods, that stemmed from his conception of dreaming as the unconscious deformation of repressed thoughts into symbolic forms.

In parallel to the success and diffusion of psychoanalysis, twentieth century visual artists have approached dreams not only as transitional objects whose spontaneous release discloses the imaginary realms of the unconscious, but also as materials for reflexive analysis and critical investigation, which are essential to modernity. After

the Second World War, applying Saussure's structuralist linguistics to Freud's psychodynamic theories led Jacques Lacan to conceive the unconscious as an organized system of chains of signifiers and to declare that it is structured like a language[10], in which dream situations are constructed by metaphor and metonymy operations. So proceeds the sculpture of Charlotte Wendy Law's series *Et la nuit?*: by condensing the image of a pair of shoes and that of a bunch of flowers, a new object is formed. There is a relation of continuity, according to Lacan, between conscious and unconscious dynamics, that he used to represent by the Moebius strip, a unilateral and non-orientable surface that can be easily rendered by taking a paper strip, giving it a 180° twist and joining the ends together. After some time, an ant walking along the strip finds itself back where it started. Mona Choo's delicate sculptures of diaphanous and tortuous characters curled up into Moebius shapes express this *extimacy*, or intimate exteriority, between conscious and unconscious – there is no clear-cut boundary.

In poetry, the work of Mallarmé embodies like no other the symbiosis between the dreamer and the dreamed. As Jean-Pierre Richard has written[11], reading Mallarmé is a double exercise requiring the material imagination described by Bachelard to both dream the words offered by the poet and let them resonate with the reader's own dreaming consciousness. His *Sonnet en X* describes an Orphic *katabasis* into the underworld of the soul, which also bears a reflexive introspection on the nature of poetic creation (the first version of this poem was entitled *Sonnet allégorique de lui-même*). Against the unavoidable void, art as a dream, devoid of meaningful message other than itself, is the only transformative salvation available to the poet and, through him, to the World.

Ultimately, the debate about the visual or verbal structure of the unconscious induces broader questions on the nature of imagination and the relationship between clinical studies and conceptions of the mind in humanities. *Live In Your Dreams!* does not intend to favour one hypothesis over the other but rather proposes to consider its physical envelope, the crypt of St Pancras Parish Church, as a transitional surface onto which artists project transcriptions of these protean forces. This collective act of cryptography brings about a choreography of perceptual experiments. When the viewer decrypts according to their oneiric subjectivity the artists' diverse strategies to encrypt the fleeting substance of dreams in material works, alliances between dreaming, interpretation and creative practice are multiplied.

The difficulty of defining a structure of imagination is reflected in Vera Bohl's musical piece *In Situ* and Lingbo Liu's video installation *Do dream here*. Both engage with the notion of 'translating' dreams into slippery riddles. Just when a familiar form seems to emerge, it metamorphoses into something unfamiliar again. Decoding the signs and signifiers from politics and public consciousness in the dreaming psyche is the object of Jonathan Kelham's developing tryptic *LOOT/MOVE/MARKET* and the large painting

Temple by Karina Akopyan. Akopyan draws an integral dream-nightmare that seems to transpose the surreal visions of Hieronymus Bosch into the visual context of modern orthodox Russia – evoking, in this sense, the Jungian conception of the unconscious as a dynamic rebalancing of the rational psyche through collective archetypal figures. The universality of some oneiric symbols will be recognised by the viewer familiar with Bosch's graphic universe, which Lacan refers to in order to discuss the consistency and regularity of the motif of the fragmented body in dreams[12].

Probing the depths of the brain

Beyond visual imagery, advances in neuroscience have allowed for a finer understanding of the perceptual features of dreams. Studies combining neuroimaging and dream reports by patients show that visual events are recorded in almost all dreams, whereas auditory elements occur in about 60% of dreams, tactile elements in about 15% of dreams, smell and taste elements in less than 5% of dreams[13]. Boris Raux works within the parameters of this final category. His olfactory narratives constitute a form of *hypersubjectivity*, adding to the subjective experience of an artwork the singular neurophysiological reception of its physical properties. The structure of the nervous system associated with olfaction is extremely heterogeneous across humans, which implies that odours are perceived differently and therefore elicit different thoughts. *The space divider (mushrooms version)* recreates a dream event that brings together the smell of mushrooms from an old cellar with that of a psychedelic mushroom. In addition to contrasting the fields of nostalgia and hallucination, Raux challenges the primacy of visuality and verbality in dreams.

Recent study findings have related the experience of dreaming to the activation of a complex pattern of regional cerebral functions during paradoxical sleep, also called Rapid Eye Movement (REM) sleep. Characterised by fast movement of the eyes under the eyelids, REM state is the neurophysiological stage during which most of dreaming occurs, although there are cases of REM sleep without dreams and dreams outside of REM sleep. There are other states such as hypnagogia, which occurs at the transition between wakefulness and REM sleep. Some individuals report visual, auditory, gustatory, olfactory, thermal or tactile hallucinations while in this state. Susan Beattie's work draws from such hypnagogic events. Her *Loop Carpet* (made of sheep intestine filled with wool) reflects the circuit structure and associative play of consciousness that characterises this very particular kind of mental state.

While the brain areas associated with REM sleep generation are well known, we are just beginning to understand the specific mechanisms that distinguish it from wakefulness. The experience of dreams depends, like wakefulness, on a large-scale neural network involving neuropsychological abilities such as attention, memory, language

and mental imagery. Jim Horne, psychophysiology researcher and editor of the *Journal of Sleep Research*, explains the neurophysiological similarity between REM sleep and wakefulness using the analogy of a computer's screen saver: REM sleep is more akin to waking state than true sleep; switched off but easily recoverable if particular exterior stimuli are perceived by the REM sleeper[14]. Specific to REM sleep are the phenomena of *atonia,* a muscular paralysis that prevents us from moving to imitate what we do or see in our dreams, and *PGO waves*, a spontaneous electrical activity initiated by neurons from the pons, the lateral geniculate nucleus and the occipital cortex regions of the brain, that accompanies each burst of rapid eye movements. Perhaps dreams result from our cortex trying to put meaning to such neural firing by compiling stories and perceptual events around these pseudo-sensations, using our memories and daily experiences. This would reflect the random aspect of successive dream events.

The brain activation pattern specific to REM sleep also involves increased activity of limbic system and decreased activity of the prefrontal-parietal cortex. As researcher Eric Nofzinger explains (see his interview in this catalogue), this finding remarkably reflects some of Freud's intuitions on ego functions and psychic mechanisms. In fact, it was Freud's original project to study dreams by interweaving both the subjective insights of psychology and objective inputs of neurology, but technological limitations of the time restrained too greatly the cartography of the brain's structure. Founding his research instead on interpretative methods that processed the available – the subject's own experience – Freud's *Interpretation of Dreams* created a lasting legacy among twentieth century therapists, theorists, writers as well as visual artists. An academic psychologist and visual artist, Andy Flett presents a playful take on Freudian dream analysis in the video work *On the Couch*, which also parodies the tradition of physiological dream studies using cats, such as those undertaken by researchers Michel Jouvet and Adrian Morrison[15]. Having removed the brain's ability to generate atonia state during REM sleep, they observed cats staring, moving and grasping things, pursuing the imaginary impulses of their dreams.

Today, progress in brain imaging allows scientists to apply biological and psychological data to new models of the mind as a dynamic organism. These attempts to construct models that fit the experience of the self provide artists not only with the renewed opportunity to develop contemporary ways of confronting the subjectivity of dreams and its scientific characterisation, but also to elaborate a critical discourse stressing the potentially disturbing implications of such research. One study[16] undertaken at the ATR Computational Neuroscience Laboratories in Kyoto, claims successful use of fMRI (functional Magnetic Resonance Imaging) in predicting the content of patients' dreams by comparing brain activity patterns to previous dream accounts. In a similar vein, Jing Hu's multimedia installation *Nightmare* appears to be an experimental

prototype enabling the viewer to remote control a light beam over the eyes of a fictional REM sleeper. The installation demonstrates the feasibility of manipulating someone else's dreams by applying a light based stimulus onto their eyelids, and conveys a subtle critique of advances in neurotechnology that seem easily transposable to instruments of censorship and the bioengineering of control.

Research drawing from fMRI brain data suggests that ventral stream areas, and possibly all sensory cortices, are heterogeneously activated during different REM sleep episodes. This gives rise to the theoretical potential for the creation of a map of dream features, in which neuroimaging data on the physical distribution of brain activity is cross-referenced with comprehensive databanks of dream reports. The tradition of registering dreams dates back to cuneiform tablets in Sumer, such as those accounts found in the *Ziqīqu*, an oneiromancy 'book' admirably documented by the Assyriologist Leo Oppenheim[17]. In the context of *Live In Your Dreams!*, Andy Flett is building a dream map for an internet generation in search of interpretation and meaning. *Last Night I Dreamt That Someone Loved Me* is a project built on retrieved records of single Google searches that highlights our increasing dependency on the internet to broadcast and mediate psychic experience. Other artists have constructed dream registers that underscore the subjectivity of the reporter and the emotional nature of the act of recalling. The record of personal dreams that Charlotte Wendy Law draws upon to form the sound installation of her series *Et la nuit?*, constitutes the complex and moving experience of an intimate diary, compulsive archive, liberation practice and public confession. The taint of nostalgia embalms Benjamin Renoux's sculpture *Untitled (Seven days of extraction)*, which epitomises the metaphor of the unconscious mine. Photographs of oneiric images surface in concrete cores, which seem to have been extracted from an abyss beyond reach.

Whether dreams be the creation of plausible décors around random electrical brainwaves, the fulfilling of a cortical restorative procedure or merely an evolutionary epiphenomenon, the true nature of dreamwork is still as foggy as the images it produces. Until such time as neuroscience determines whether dreaming is essential to our brain physiology, many of us will continue to relate to this bewildering facet of our psyche with a sense of rapture and spirituality, and turn to art's transcendent contemplation of this nooscopic question – a tradition dating from the first myths of mankind that the dark subterranean crypt of a church can only illuminate.

Notes

1. Gaston Bachelard, *The Poetics of Space* (Boston, MA: Beacon Press, 1994), p. 18.

2. Diane Wolkstein and Samuel Noah Kramer, *Inanna, Queen of Heaven and Earth* (New York: HarperCollins, 1983).

3. Joseph Campbell, *The Hero with a Thousand Faces* (Novato, CA: New World Library, 2008), p. 29.

4. Fyodor Dostoevsky, *Notes from the Underground* (Indianapolis, IN: Hackett Publishing, 2009).

5. The most developed account of the dream can be found in Jung's autobiographical work *Memories, Dreams, Reflections* (New York: Vintage Books, 1989), pp. 158-9.

6. Gaston Bachelard, *The Poetics of Space* (Boston, MA: Beacon Press, 1994), p. 15.

7. Donald Spence, *The Freudian Metaphor: The Rhetorical Voice of Psychoanalysis* (Cambridge, MA: Harvard University Press, 1994)

8. Freud's famous sentence 'The poets and philosophers before me discovered the unconscious. What I discovered was the scientific method by which the unconscious can be studied' was first quoted by Philip R. Lehrman in 'Freud's Contributions to Science' in *Harofe Haivri* Vol.1, 1940, then cited by Lionel Trilling in *The Liberal Imagination: Essays on Literature and Society* (New York: Viking Press, 1950).

9. Georges Didi-Huberman, *Invention of Hysteria: Charcot and the Photographic Iconography of the Salpêtrière* (Cambridge, MA: MIT Press, 2003).

10. Jacques Lacan, *The Seminar. Book III. The Psychoses, 1955-56.* (London: Routledge, 1993), p.167.

11. Jean-Pierre Richard, *L'univers imaginaire de Mallarmé* (Paris: Seuil, 1962).

12. Jacques Lacan, 'The Mirror Stage as Formative of the Function of the I as Revealed in Psychoanalytic Experience' in *Ecrits* (New York: Norton, 1981), pp. 4-5.

13. Sophie Schwartz and Pierre Maquet, 'Sleep imaging and the neuro- psychological assessment of dreams', in *TRENDS in Cognitive Sciences*, Vol. 6, No. 1, 2002, p. 24.

14. Jim Horne, *Sleepfaring: A Journey Through the Science of Sleep* (Oxford : Oxford University Press, 2006).

15. Jim Horne, *ibid*.

16. T. Horikawa, M. Tamaki, Y. Miyawaki, and Y. Kamitani, Neural 'Decoding of Visual Imagery During Sleep', in *Science*, Vol. 340, No. 6132, 2013, pp. 639-642.

17. Leo Oppenheim, 'The Interpretation of Dreams in the Ancient Near East. With a Translation of an Assyrian Dream-Book', in *Transactions of the American Philosophical Society*, New Series, Vol. 46, No. 3, 1956, pp. 179-373.

THE NATURE OF DREAMS

An interview with Eric Nofzinger

Eric Nofzinger was Professor of Psychiatry and Director of the Sleep Neuroimaging Research Program at the University of Pittsburgh, School of Medicine, before founding the company Cereve in 2008. He has also been a President of the United States Sleep Research Society and a President of the Sleep Research Society Foundation. His research focuses on the brain mechanisms involved in sleep and sleep disorders, using data from Positron Emission Tomography (PET) and functional Magnetic Resonance Imaging (fMRI). He published widely in this field and pioneered the use of these neuroimaging methods to develop a neurobiological model of insomnia. He recently co-edited the book *Neuroimaging of Sleep and Sleep Disorders* with Pierre Maquet and Michael J. Thorpy (Cambridge: Cambridge University Press, 2013).

Stéphane Verlet-Bottéro — In a 2004 study you discovered an anterior paralimbic REM activation area containing key cortical & subcortical components of the emotional and social brain. What do these neural structures contribute to the experience of dreaming?

Eric Nofzinger — Correct. The "content" of dreams, including the images, the stories, the feeling states would be expected to be derived from the relative activation of these structures. So, the dream experience is a by-product of the cognitions and emotional states that reside in these structures. For example, our strong, primitive emotions such as fear, anxiety, anger and sexual drives are thought to reside in or are regulated by these structures and activation of these structures could be thought to be responsible for the typical dream-like experiences we typically associate with dreaming.

SVB — PET/fMRI neuroimaging techniques have also revealed that contrary to limbic and paralimbic functions, areas of the prefrontal cortex sustaining cognitive control and metacognition are largely deactivated. That could explain that something we would recognize as absurd in awake state may feel normal in dream-state. Could we argue that recent research validates the Freudian theory of the unconscious in the case of dreams?

EN — I would agree. The 'executive' brain, including the prefrontal cortex is thought to be responsible for our waking, conscious cognitive sense of control, planning and willed thought. These typically modulate our more primitive impulses, emotions and basic emotional drives. The apparent lack of activation of these structures in REM sleep implies that these processes are not active in dreaming, allowing for the expression and more unfiltered experience of more primitive emotional states and feelings in dreaming.

In terms of Freudian structural models of mental processes or the psyche, the id, ego and super-ego are the three parts of the psychic appartus; they are the three theoretical constructs in terms of whose activity and interaction mental life is described. According to this model of the psyche, the id is the set of uncoordinated instinctual trends; the super-ego plays the critical and moralizing role; and the ego is the organized, realistic part that mediates between the desires of the id and the super-ego. The id processes closely resemble what we currently ascribe to be the functions of anterior paralimbic cortex and would be active in dreaming. The ego and super-ego processes closely resemble what we currently ascribe to be the functions of the executive cortex and would tend to be less active or play less of a role in dreaming. The functional neuroanatomy of REM sleep then would be supportive of this basic notion of Freudian models of the psyche in which dreams represent the expression of the id in the absence of oversight, or control by the super-ego and ego.

SVB — Some of your more recent research focuses on the relationship between depression and REM sleep, demonstrating that the anterior paralimbic function is altered while tectal and left hemispheric areas are more active than in healthy REM sleep. How does this affect the sleep and dreaming process of people suffering from depression?

EN — The experience of depression, which includes feelings of lack of control, loss of will, impaired cognition and a general loss of regulation of strong emotions could be explained by the general impairment of frontal and pre-frontal cortex function and unregulated limbic and paralimbic activity. The imaging studies of depressed patients show impaired frontal cortex function and an upregulation of limbic and paralimbic structures in REM sleep. In this manner, the alterations in brain function during REM sleep may be a reflection of a loss of balance between executive and limbic and paralimbic cortex in depressed individuals in which they are driven more by strong, mostly negative emotional states that tend to be unregulated by more rationale thought.

SVB — Neuroimaging has also contributed to the discovery of fundamental alterations of the function of limbic and paralimbic neural systems in human sleep

pathologies. Has this helped understanding sleep disorders and finding ways to cure them?

EN — The depression findings, and the characteristic sleep pathologies noted in depressed patients such as difficulty falling asleep, staying asleep and early morning awakenings, are perhaps the best and most studied example of fundamental alterations of limbic and paralimbic neural systems among all sleep disorders. Similar findings have been shown in the sleep disturbances of patients with post-traumatic stress disorder, a disorder characterized by sleep disruption and by the repetitive unwanted traumatic dreams they can experience, often reliving their original traumatic event. Examples include trauma related to combat and trauma related to rape.

Patients who suffer from insomnia alone, which is difficulty falling asleep or staying asleep, even in the absence of depressed or anxious symptoms, have also been shown to have abnormal degrees of activity in brain structures that mediate arousal and that overlap extensively with limbic and paralimbic brain structures. Indeed, some studies showing successful treatment of insomnia with cognitive behavior therapy have shown reductions in limbic activity during sleep following treatment.

SVB — In that perspective, how much does REM brain activity contribute to functional restoration and feeling well during the day?

EN — While the evidence here is a little more indirect, there are several research findings that would suggest that REM brain activity plays an important role in functional restoration and feeling well during the day. As noted above, depressed patients have abnormal REM brain activity and do not feel refreshed on awakening and do not feel well during the day. Many medications that treat depression are known to inhibit REM sleep likely by dampening activity in limbic and paralimbic structures. Individuals going through stressful life events who show some degree of working through their stressors in their dreams tend to do better over time, i.e. feel better during the day, than individuals who do not show evidence of working through their stressors in their dreams. There are many lines of evidence, therefore that what the brain is doing in REM sleep has a significant influence on how we feel when we awaken and how we feel and function during the day.

SVB — There has been cases of people with cortical lesions depriving the brain from REM sleep, who have a totally normal existence otherwise. Ultimately, can neurobiology say if dreaming is essential to brain function or more an epiphenomenon of REM sleep?

EN — One can find exceptions where REM sleep does not occur, either resulting from some brain lesion or from certain medications, and otherwise normal function is present. In these instances, presumably, the brain is able to find alternate ways of adapting to life than through the normal occurrence of REM sleep dreaming. This is probably more an example of how the nervous system can adapt to somewhat unnatural conditions rather than providing evidence that REM sleep is not essential for normal functioning. The more parsimonious view would be that REM sleep is a naturally occurring phenomena in the vast majority of individuals, is known to activate structures known to play a fundamental role in the regulation of instinctual behavior and probably plays some essential role in the overall regulation of emotional behavior and subsequently how we feel and act when we are awake.

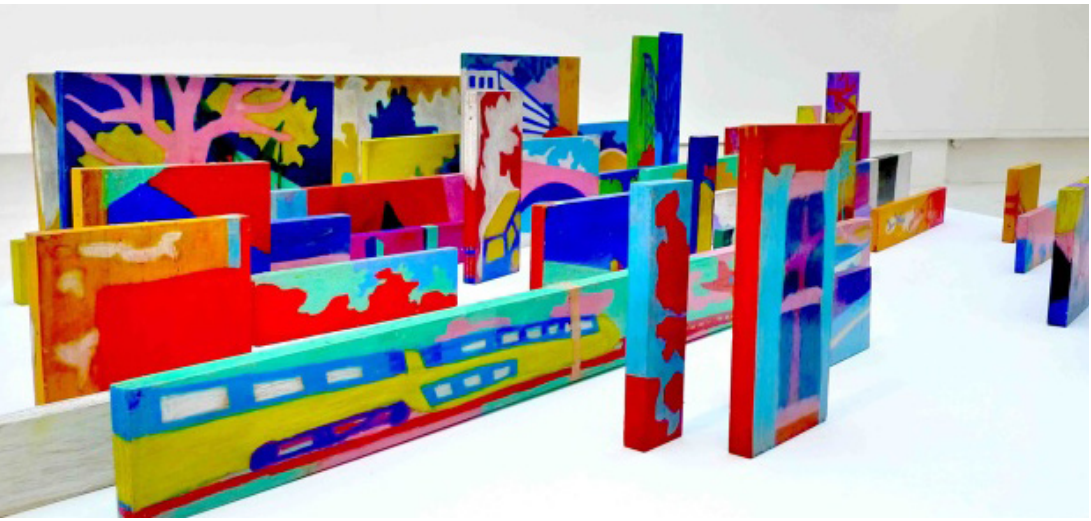
PARTICIPANTS

Karina Akopyan, *Temple*, 2013. Ink and marker on paper, 230 x 140 cm.

Alma Bakiaj, *Untitled*, 2014. Digital print on aluminium composite panel, dimensions variable.

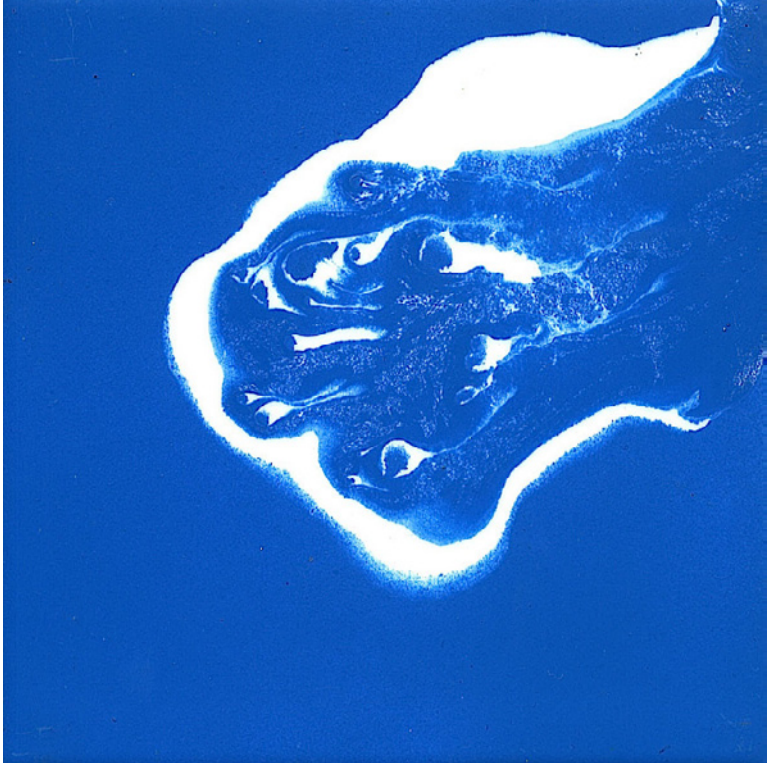
Susan Beattie, *Loop Carpet*, 2013. Sheep intestine, wool, 200 x 100 x 8 cm.

Vera Bohl, *In Situ*, 2014. Performance.



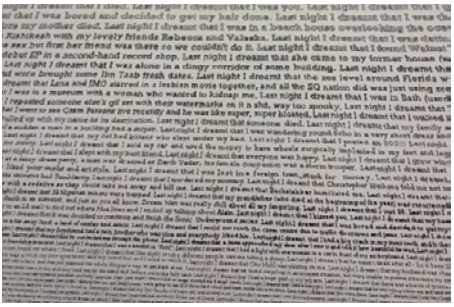
Susie Calvert, *Microcosm*, 2013. Wax crayon on plywood, 150 x 150 cm.

Mona Choo, *Stuck*, 2014. Printed acrylic, dimensions variable.



Valentin Dommanget, *66 ENAMELED TILES*, 2011. Acrylic spray pigment, chemical solution, wax on enamelled white tiles, 15 x 15 cm.

Andy Flett, *On the Couch* (still), 2014. HD Video, 30 min.

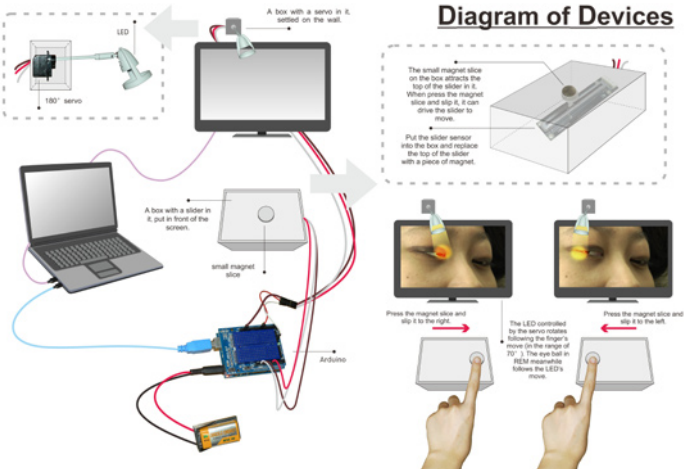


Andy Flett, *Last Night I Dreamt That Someone Loved Me* (detail), 2014. Ink on paper, 150 x 250 cm.

Kelise Franclemont, *limn reverie*, 2014. Ink on paper, installation and performance.

Jonathan Kelham, *LOOT*, 2013. Pen on paper, 30 x 42 cm.

Jonathan Kelham, *MOVE*, 2013. Pen on paper, 30 x 42 cm.



Program of Arduino :

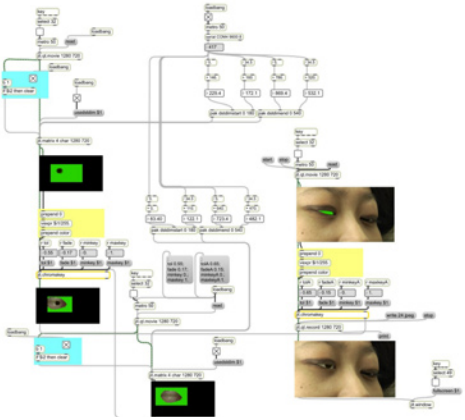
```
int readPin = 0;
int servopin = 7;

void servopulse(int angle)
{
  int pulsewidth=(angle*11)+500;
  digitalWrite(servopin,HIGH);
  delayMicroseconds(pulsewidth);
  digitalWrite(servopin,LOW);
  delayMicroseconds(20000-pulsewidth);
}

void setup()
{
  Serial.begin(9600);
  pinMode(servopin,OUTPUT);
}

void loop()
{
  int readValue = analogRead(readPin);
  Serial.println(readValue);
  int angle = readValue / 14;
  for(int i=0;i<50;i++)
  {
    servopulse(angle);
  }
}
```

Program of MAX/JITTER :



Jing Hu, *Nightmare*, 2012. Multimedia installation, dimensions variable.

Ses purs ongles très haut dédiant leur onyx,
L'Angoisse, ce minuit, soutient, lampadophore,
Maint rêve vespéral brûlé par le Phénix
Que ne recueille pas de cinéraire amphore

Sur les crédences, au salon vide : nul ptyx
Aboli bibelot d'inanité sonore,
(Car le Maître est allé puiser des pleurs au Styx
Avec ce seul objet dont le Néant s'honore.)

Mais proche la croisée au nord vacante, un or
Agonise selon peut-être le décor
Des licornes ruant du feu contre une nixe,

Elle, défunte nue en le miroir, encor
Que, dans l'oubli fermé par le cadre, se fixe
De scintillations sitôt le septuor.

Charlotte Wendy Law, *Et la nuit?*, 2014. Sculpture, sound installation and performance (in collaboration with Sadie Edginton, David C James and Núria Guix). Photo: Marco Berardi.

Lingbo Liu, *Do dream here* (still), 2014. Video installation, 1:45 min.

Her pure nails on high dedicating their onyx,
Anguish, at midnight, supports, a lamp-holder,
Many a twilight dream burnt by the Phoenix
That won't be gathered in some ashes' amphora

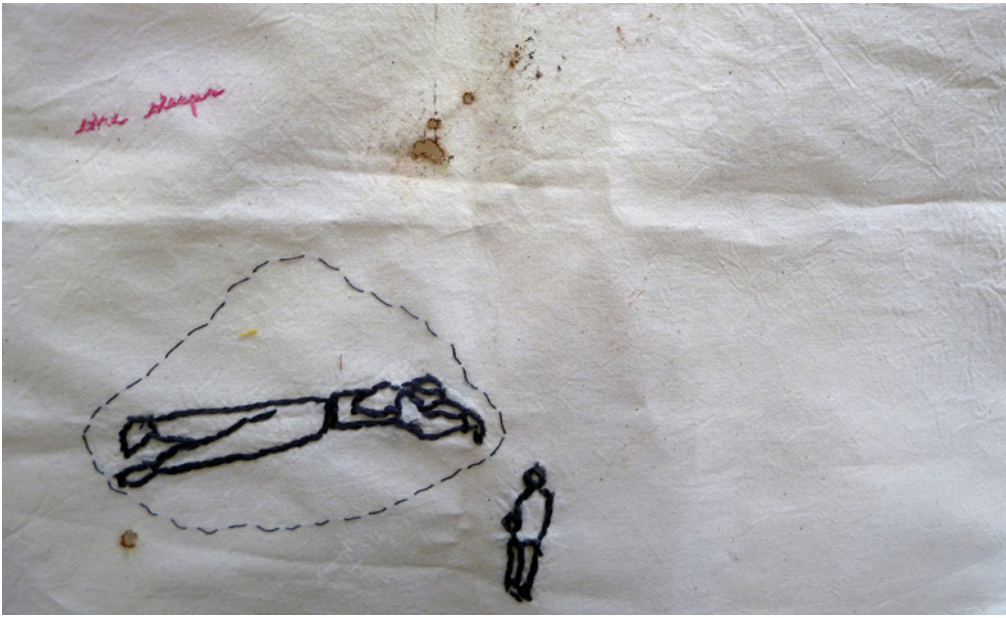
On a table, in the empty room: here is no ptyx,
Abolished bauble of sonorous uselessness,
(Since the Master's gone to draw tears from the Styx
With that sole object, vanity of Nothingness).

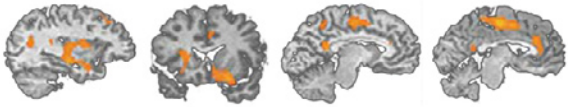
But near the casement wide to the north,
A gold is dying, in accord with the décor
Perhaps, those unicorns dashing fire at a nixie,

She who, naked and dead in the mirror, yet
In the oblivion enclosed by the frame, is fixed
As soon by scintillations as the septet.

Stéphane Mallarmé, 'Sonnet en X', in *Poésies*, 1899.
Translation by A. S. Kline.

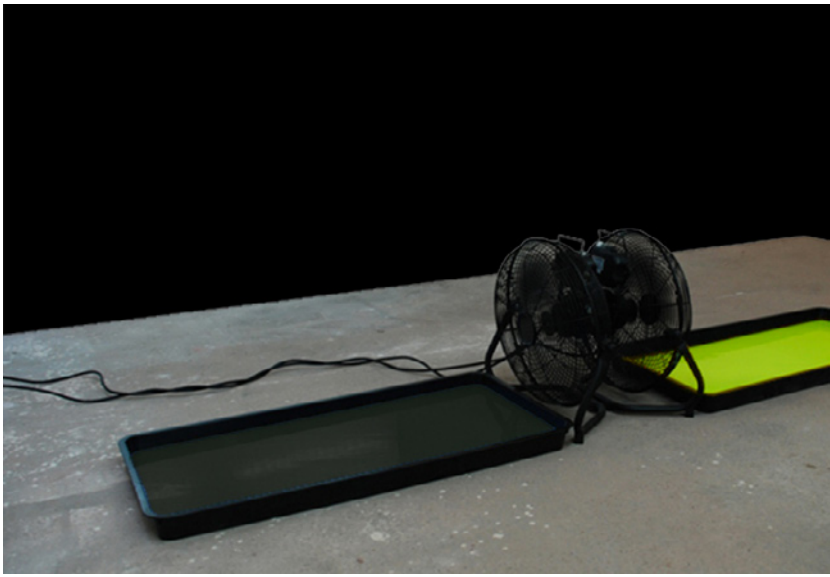
Mary McFerran, *She Sleeps*, 2013. Cotton fabric, embroidery stitches, 33 x 25 cm.

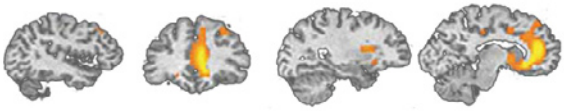




Alexandra Pace, *Dreams*, 2013. Silver gelatin prints, dimensions variable.

Boris Raux, *the space divider - mushrooms version* (in collaboration with the perfumer Laurence Fanuel), 2014. Fans, electronic controls, washtubs filled with cave mushroom and psilocybin mushroom smells, 250 x 50 x 40 cm.





Eric Nofzinger, *Waking-to-REM sleep activations in healthy subjects* (detail), 2006. Digital C-print, 40 x 30 cm.

Teresa Braula Reis, Sketch for *The Deepest Window*, 2014. Metal, cement, perspex, velvet, 250 x 200 x 65 cm.

Benjamin Renoux, *Untitled (Seven days of extraction)*, 2013. Concrete, pigments, photographs, varnish, 1200 × 12 × 12 cm.

Hans Richter, *Dreams That Money Can Buy* (still), 1947. Film transfered to DVD.

Mehmet Ulusahin, *Lost It in the Movies Series*, 2013. Monoprints, 21 x 29 cm.