VOLCANOES AND THE UNCONSCIOUS MIND: A CASE STUDY

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A BRIEF INTRODUCTION: A GUIDE TO THE VOLCANO AND THE UNCONSCIOUS MIND

In psychological analysis, the creation of a metaphorical dialogue is necessary to the success of symbolic association, where the unconscious mind personifies aspects of its surrounding material culture and natural landscape. The volcano has long held its place in the Western world as a metaphor used to understand creation, morality, and nature itself (Frierson 1991). For instance, it is easy to see how the volcano is universally acknowledged as a thing of power in the natural world. The containment of gas and lava coupled with its release in violent eruption has become a general metaphor used to describe explosion in human life, whether this is of a personal, cultural, or political nature. But more difficult to understand may be the subtler implications behind the image of a volcano as perceived by human society, for societies often assign orders such as class, gender, and race to notions of power. Some of these perceptions can be analyzed from a psychological perspective, not to make conclusions about human culture, but rather to understand the volcano as the early psychologists understood the attributes of the unconscious mind. I will be using the works of Carl G. Jung to discuss the volcano as 1.) a metaphor, 2.) a motif that reveals universal archetypes, 3.) a geological formlessness indicative of pre-thought, and 4.) an important transformative space that recalls the work of ancient and medieval alchemists.

This paper exists as a series of rhizomatic progressions, in which the topics of myth, metaphor, form, formlessness, alchemy, science, and art must all be accepted as part of the paradoxical existence of the volcano both in its own world and within the human psyche. And yet I have done my best to make sure that these progressions try to follow a logical order, most usefully seen in the paper's table of contents. For instance, "The Portrait of a Volcano as Artist" must follow "The Volcano as Non-Metaphor: That Which Exists" in order to demonstrate how *artistic form* can

follow *formlessness*, and indeed, this concept is explored in both art theories and ancient cosmogonies. If the volcano is the image of the cosmos (as I will be suggesting), so too is it the artist or creator who brings form to the cosmos and creates the world according to his own design. Contained within these actions is that great power for both creation and destruction, further aligning the volcano with the 20th century *cliché* of an artist: the self-desctructive creative genius like Van Gogh, Modigliani, or Rimbaud. A volcano is also a self-destructive creative genius, but people have been reluctant to call volcanoes artists because they do not inhabit a human body.

A discussion of these various ideas can be had alongside a close study of the methods by which early psychologists like Freud, Jung, and Rank made connections from symbolic language, from abstractions, to psychological reality. I am not the first to use the volcano so closely within the context of psychological analysis; Freud himself did such a thing in his work *Delusion and Dream*, a case study of *Gradiva*, a 1903 novel by Wilhem Jensen about a young man's experiences with love and Pompeii. You will also find that I discuss the volcano in many contexts that often contradict each other (for example, how can a volcano be a metaphor and a non-metaphor at the same time?) My defense of this is that the definitions and qualities of volcanoes are as changeable as volcanoes themselves. Eruptions change the faces of volcanic craters. Lava displaces rocks and creates them at the same time. Volcanic activity can never be entirely predicted, and a volcano that has been quiet for a thousand years can suddenly decide to erupt violently, destroying cities, or simply let off a cloud of steam that alerts scientists to monitor its activities. It is this very changeable personality that gives volcanoes living, breathing functions like those examined in human beings by early psychologists like Freud, Jung, and Rank. This is, in essence, a case study of "volcanic behaviour," just as Freud and Jung developed their field through the study of hysterical and schizophrenic patients in the early twentieth century (Appignanesi 2008).

A DISCUSSION OF SYMBOLS: THE CASE FOR THE VOLCANO IN PSYCHOLOGY

"Man feels himself isolated in the cosmos. He is no longer involved in nature and has lost his emotional participation in natural events, which hitherto had a symbolic meaning for him. Thunder is no longer the voice of a god, nor is lightning his avenging missile. No river contains a spirit, no tree means a man's life, no snake is the embodiment of wisdom, and no mountain still harbours a great demon [. . .] His immediate communication with nature is gone for ever, and the emotional energy it generated has sunk into the unconscious."

-C.G. Jung, *Symbolic Life,* "Healing the Split," 255.

Herein lies the trouble with humankind: the great umbilical cord that once existed between human beings and the natural world has been severed forever by the exacting, scientific scissors of progress, and that which was once a part of "natural" human understanding has been relegated to the unconscious mind, that hidden realm where human beings are so often reluctant, if not afraid, to journey, as if the consequences of rediscovering what has long been repressed would force a man to change his behaviours, his worldview altogether. This is merely a dramatic paraphrase of what Jung argues in his article "Healing the Split," part of his treatise on *Symbolic Life*, where Jung discusses the importance of symbols to human understanding.

But in simpler, less dramatic terms, what Jung argues has a great deal of truth and relevancy to it, for it has long been suggested that the modern constructions of urban life have crippled mankind's interactions with nature, if only for the reason that in nature he spends less of his time.[1] Jung is perhaps most famous for his theories on "collective memory," or the "collective unconscious," and it is in *Symbolic Life* that he suggests that such a collective memory is based in humankind's early, primitive life -- and from this primitive life, this ancient understanding of an external reality, all symbols are derived (Jung 1976, 255). These symbols are "natural symbols," or elements of the natural world such as mountains, rivers, or animals, that take on metaphorical

[1] The human beings and their relationship to "nature" is something that, in the modern order, is becoming increasingly more problematic and difficult to define. Environmentalists today will insist that human beings are, and have always been, as "natural" as the natural world, for we are living, evolving creatures just like the flora and fauna that surround us. And yet, today more than ever, there exists a deeply understood division of nature and culture, of wilderness and city, of indigenous "sustainable" living and the inevitable waste products of urban, industrial life. Jung would most likely assert in response to this that all human progress represents a continual drifting-away from man's earliest, most "nature-oriented" state.

meanings according to the way that human beings perceive them. For instance, lions have long held the symbolic status of kingship, from ancient Egypt and Mesopotamia to modern-day Britain, presumably because there is something about a lion that is sufficiently representative of "regal power" in the human mind. Natural symbols "are derived from the unconscious contents of the psyche, and they therefore represent an enormous number of variations on the basic archetypal motifs. In many cases, they can traced back to their archaic roots, i.e., to ideas and images that we meet in the most ancient records and primitive societies"(Jung 1976, 253). These ideas are universal, creating the possibility for universal archetypes.

If our primitive understanding of nature (which Jung suggests is closest to the reality of nature) has been sublimated to the unconscious mind, then it can be argued that the unconscious mind brings us closer to the natural world, and that indeed it is the only part of the human mind that can claim to work within the realms of nature itself. Can it be possible to claim, then, that the unconscious is a force with behaviours like any other natural force, such as a river, a desert, a volcano? These are landforms that have often been used as metaphors for the various aspects of human existence: tears flowing like a river, ideas as dry as a desert, emotions erupting like a volcano. If these human-fabricated symbols are derived from natural occurences, what happens if we turn the symbol back onto itself? We find that all of these projections of the natural world simply *are*, and it is we who have made them human. Emotions no longer erupt *like* a volcano; the volcano simply erupts. Suddenly nature becomes as alive as the human mind that creates its meaning, for what is it that is contained within an eruption? What occurs, exactly, when a volcano is erupting?

Psychology is the only science in which *free association* and *emotion* are given relevancy, and indeed they are given the highest analytical value. There are many sciences that have been explored in the study of volcanoes: geological and archaeological sciences remain the most popular. Why, then, should the science of psychology be left so coldly in the dark? It may be argued at this point

that psychology is the study of the *human* mind, and so it would be greatly misapplied and somewhat self-defeating to analyze the psychology of a "thing" that cannot respond to questions about its childhood. And yet psychology is also an exacting study of behaviour in general, and indeed animal behaviours have long been used to study conditioning scenarios involving foods, chemicals, and even parental care (Pavlov 1903, Harlow 1958).

In an attempt to "heal the split," as Jung would encourage, I will take a primitive's stance on the volcano and call it a living thing, with its own stories, behaviours, and eccentricities. It is with a grain of salt that I call such a stance "primitive," for many scientists and volcanologists would not argue with the idea that a volcano, in all of its activity and unpredictability, is the rock of the earth in its most living, changeable form. And if these living forms have been transferred to the human unconscious, then surely the volcano lurks in the unconscious as something tremendously powerful, worthy of deeper understanding.

To put it very simply: "[w]hatever else the unconscious may be, it is a natural phenomenon that produces symbols, and these symbols prove to be meaningful"(Jung 1976, 262). In the next section, "Volcanos: A Behavioural Study," I will explore the various symbols that the unconscious mind may attach to volcanic activity through scientific descriptions.

VOLCANOES: A BEHAVIOURAL STUDY

Volcanology can be said to have begun when the Greek and Roman ancients began recording volcanic activity in the Mediterranean region, and interpreting their records according to their worldview. If this is so, then we must say that psychology was born when man began to ask questions about the nature of his existence, devising philosophies and religions in order to make sense of himself. In truth, both volcanology and psychology have radically different faces today than in the time of their birth, and even since the 18th and 19th centuries when the beginnings of "modern" scientific thought took root, these sciences have changed dramatically. Volcanology as we

know it today is a direct consequence of the scientific studies in the latter half of the 20th century, when the theory of tectonic plates was devised as an explanation for the movement and partial melting of the earth's crust (Schick 2002, 86). Psychology in the last few decades, interestingly enough, has taken a turn towards the hard science of the brain and left Freud and Jung's world of the ego to a few practicing specialists. But it is the world of Freud and Jung that can illuminate some of the philosophical properties of volcanoes, creating a new metaphorical dialogue separate from mythology and archetypes, which will be discussed in another section of this paper.

Interestingly enough, however, archaic theories of volcanology can correspond more closely to early theories in psychology than those of modern volcanology. For instance, Aristotle believed that volcanic eruptions occurred because compressed air within the earth was ignited and then released (Schick 2002). Such a process can be related in human terms to Freud's famous theory of repression, where the unconscious mind stores events and occurences too catastrophic to be understood by the conscious human being. Freud developed psychoanalysis because he recognized that such powerful forces within the human mind need to be released and properly interpreted, or else they become neuroses and hysterias. It is this *release* of what is repressed that remains fundamental to a patient's health and well-being. Similarly, using Aristotle's theory, the release of volcanic materials is necessary to maintain the balance of pressures within the earth. This is not, however, what happens during a volcanic eruption, and so we shall have to look elsewhere when we relate volcanic behaviour to human behaviour in psychological terms.

Volcanoes erupt because partial melting in the earth's mantle separates liquid and solid rock according to density; liquid rock, or magma, is less dense than solid rock and so it has a buoyancy that allows it to rise. This buoyancy in combination with the various pressures and caused by tectonic activity allow magma to break through the surface of the earth (Schick 2002, 90). When this magma breaks through the surface of the earth, it is powerful enough to take along with it pieces of rock within the Earth's mantle called *xenoliths*. *Xenoliths* are like dreams in psychological

theory. The events that occur in dreams are the uncorrupted symbols of the unconscious mind, and they come to consciousness in the memory of the dream and can then be interpreted by the dreamer or the analyst (Freud 1938). According to the early psychologists, the analysis of dreams is one of the purest routes to the unconscious. Similarly, *xenoliths* are the "only way to collect relatively unaltered rocks from the Earth's mantle [. . .] [and they] have also been called 'meteorites from the interior of the Earth"(Schick 2002, 88). If we view the surface of the earth as the conscious and the mantle as the unconscious, then all materials that come from the mantle to the surface are making that journey from the unconscious to the conscious. Just as a psychologist analyzes dreams to discover the complexes of the unconscious, so too do scientists study *xenoliths* to explore the inner workings of the Earth.

If the basic metaphor remains that volcanic activity, coming from the earth's mantle, is like that which surfaces from the unconscious to the conscious, then it is possible to discuss Freud's theory of repression in terms of the neuroses and eccentricities of his hysterical patients. It is with great trepidation, though, that I compare a volcano to a hysterical woman, for such a comparison is extremely subjective and perhaps far-reaching. However, it is important to at least explore the subject, because the treatment of hysterical patients was one of the initial concerns of psychology and actually greatly advanced the field's understanding of therapy in general. Similarities between volcanic and hysterical behaviour can be noted, if only by an analysis of imagery that appears in the form of emotive destruction.

Hysteria is a 19th and early 20th century phenomenon, a reactionary illness rooted in the oppressive, male-dominated environment of Victorian Europe (Appignanesi 2008). Hysterical patients, exclusively women, were often noted to be schizophrenic, a term whose modern definition is radically different and indeed today would be misapplied. Symptoms range from muscle contractions, loss of control over the limbs of the body, and paralysis, to crying fits, prolongued rage, uncontrollable sexual behaviours, and vivid hallucinations. One patient in the early studies of

hysteria was known to burn down her room whenever her doctors suggested that she was well enough to return to her family (Appignanesi 2008). This patient destroys her own living space, setting fire to her surroundings, just as a volcano frequently sets fire to itself. On the other hand, patients were known to experience periods of calm, normal behaviour and then become ill again at any point, exhibiting similar symptoms. But symptoms are so varied and so particular to a patient's experiences that any radical, dramatic, and destructive behaviour was deemed by doctors as "hysterical." The tragedy of this illness, in all of its forms, comes from the deep misunderstanding of *women* by men in nearly all faculties of life, and it was by men that most of these women were made to understand themselves, even after they were cured.

The extreme behaviours manifested in hysteria can be likened, once again with trepidation, to volcanic activity. I say this because, while the reasons behind hysterical symptoms can be discovered and analyzed, the symptoms themselves are so strange and particular that they often have no relationship to the cause of the illness. Gas bubbles determine the viscosity of magma within the earth, and this is what determines the explosiveness of a volcanic eruption (Schick 2002, 114). But this does not necessarily explain why, where, and when certain types of eruptions occur. Strombolian eruptions are short, string-like bursts of lava, while effusive eruptions are slower, less "violent" ejections of lava that remain on the ground. Phreatic explosions are eruptions of gas and steam, while a Plinian eruption is a high-speed, high-energy, destructive release of ash, shaped often like a nuclear mushroom cloud. Kliuchevskoi, a volcano in the Kamchatka Peninsula in Russia, has erupted with strombolian activity without fail since the beginning of its recent activity in September 2009. Eyjafjallajökull, a volcano in Southern Iceland, has recently made news headlines because of its recent emission of a great cloud of ash and steam after being dormant since 1823. Eruptions can happen at any time, and no scientist can fully predict when or what kind of eruption might take place. Volcanic dormancy, coupled with sudden activity either predicted or not predicted by scientists, can be likened to those periods of calm that hysterical patients could experience in the

midst of their affliction. The key difference is that psychologists have been successfully able to discover events and behaviours that trigger such psychotic fits, remove them from the patient's surroundings, and work through curing them. Why a volcano may remain dormant for hundreds of years, and then suddenly erupt without warning, remains a mystery to volcanologists, despite scientific advances in seismic monitoring, as Rolf Schick explains in *The Little Book of Earthquakes and Volcanoes:* "even with all the knowledge of modern volcanology and high-quality measuring methods, we do not have even marginally satisfactory answers to questions about [volcanic] activity. Will the next eruption come in one week or in one thousand years? What will the transition from quiescence to activity look like? Will this phase last one hour, or a week, or longer?"(Schick 2002, 81).

This is the volcano's scientific mythology, its modern story: the science of the volcano described through the science of psychology. I would now like to turn the focus of my discussion to the more ancient stories of volcanoes, those stories which make up the mythological canon of the Western world. In doing this, we will see how greatly the scientific and ancient mythologies differ, for in ancient mythology, the volcano is almost invariably used as a metaphor for the power of the gods, or for the gods themselves.

THE VOLCANO AS METAPHOR: MYTH AND POWER

In the short film "Precise and Tolerant" by Clive Oppenheimer and Gianluigi Ricuperati, images and sounds of volcanic activity are presented alongside poetic text in an attempt to describe, though not definitively, the nature of volcanoes. Not definitively because it is very clear that this film, crafted and produced by one of the most respected volcanologists of today, conveys that there is something about a volcano that cannot be fully grasped or understood by the human mind. Volcanoes are "epiphanies that cannot be experienced but only seen"(Ricuperati "Precise and Tolerant").

This mystery of the volcano, this "sight epiphany," is perhaps why volcanoes have long been used as metaphors to express colossal power and fiery infernos, and were also at the heart of the 19th century craze for the *sublime*, or, that which is so immense that it is beyond human comprehension. The volcano, with its active, living spirit of magma, gas, steam, and rock, not to mention the beauty and terror inspired by such natural activity, sparked the imaginations of poet Emily Dickenson, explorer/Renaissance man Alexander von Humboldt, painter Jules Tavernier, and travel writer Isabella Bird, to name only a few who sometimes placed volcanoes at the center of their work (Sachs 2006, Frierson 1991). Before the 19th century, volcanoes were primarily understood by the medieval Christian mind as portals to the abyss of hell; this interpretation is evident in the numerous writings and paintings that describe or depict hell as an eternal place of punishment for sinners. Hieronymous Bosch's tryptych "The Garden of Earthly Delights" provides one important example, while another is Dante Alighieri's depiction of purgatory in his *Divine Comedy* as a mountain with terraces of rock, smoke, boiling mud, and burning tombs.

But it is in Greek and Roman mythology that the metaphor of the volcano first becomes manifest in the Western canon of religious and philosophical thought, and it is here that my previous discussion of symbols in the unconscious mind takes on a more complicated form. Beyond symbols, Jung argues that basic motifs in the human mind become universal archetypes within the collective unconscious: the *hero* archetype, the *dual mother* archetype, and the *psychology of the child* archetype are all constructions that Jung analyzes in his writing on mythology (Segal 1998). According to Jung, "[a]rchetypes are the unconscious raw material of myths," making mythologies both consciously created stories and unconscious revelations of archetypes, where "motifs" and "primordial images" are woven together "to reveal to consciousness the collective unconscious"(Segal 1998, 82-5). Close analysis of relevant mythological stories will reveal that the volcano is a motif that can be used to explore three different kinds of Jungian archetypes: the shadow, the god, and the devil.

But before I continue with a discussion of these myths, it is necessary to establish one quality common to all mythologies, and to shed light on the psychic state of the men who invent them. This is the tendency to give nature human or god-like attributes. By personifying nature in this way, man is not only bringing to life the world around him, but he is also demonstrating how he is *unable to consciously understand this world* in non-human terms. Jung writes: "It is not enough for the primitive to see the sun rise and set; this external observation must at the same time be a psychic happening: the sun in its course must represent the fate of a god or hero who, in the last analysis, dwells nowhere except in the soul of man"(Segal 1998, 71). Does this mean that, rather than understanding the volcano in mythological, metaphorical terms, we will be using the following volcano mythologies to understand the human psyche, the human soul? I believe that, in the case of mythology, it is more accurate to suggest that these stories are interpretations of human life.

Frierson points out that volcanoes play an important role in Mediterranean mythology, and have thus affected our Western perceptions of them because, thanks to the Italian Renaissance, we claim Greek and Roman culture as the beginnings of Western thought: "As Westerners, we inherit a mythology that is shaped by volcanism: in its images from the classical world of Etna and 'fire-vomiting' Vesuvius; in Greek and Roman myths of the Titans, who inhabit volcanoes and battle Jupiter; in tales of volcanoes as the workshops of the gods"(Frierson 1991, 88). It should be remembered that the very word "volcano" is an invocation of a god. The English word "volcano" is derived from the Latin "vulcanus," or "Vulcan," the Roman god of fire. In Greek this god was called Hephaestus, and his workshop, as noted by Frierson, was at the base of a volcano.

Three volcano mythologies are outlined by Patricia A. Johnston in her book "Cultural Responses to the Volcanic Landscape: The Mediterranean and Beyond" as being the most prominent. The first comes from Hesiod's *Theogony*, where Zeus battles the Giant Typhoeus for control of the world. When Typhoeus loses, the "earth melted in the incadescent flame" of Hephaestus, and "in anger Zeus hurled [Typhoeus] into Tartaros's pit"(Hesiod, quoted from

Johnston 2005, 298). Typhoeus thereafter dwells in Mt. Etna, Tartaros's pit, hurling fire out of it in his great rage. This is an ancient Greek explanation of volcanic activity: a volcano is a mountain where an angry Titan lives, forever confined to the insides of the earth in his defeat by the god Zeus. In metaphorical terms, a volcanic eruption represents the thwarted efforts of a divine being. For Typhoeus, the volcano is a place of punishment.

A Jungian intepretation would suggest that this myth is actually a story through which the collective unconscious reveals the "shadow" archetype, which encompasses weak or instinctual aspects of the human character that have been repressed in the unconscious. The "shadow" can represent the human being in his most primitive state, or any other facet of character that has proved itself to be inadequate in social or cultural surroundings (Pennachio 1992, 243). This archetype shows itself through the Giant Typhoeus who, because of his failures in combat with Zeus, is literally suppressed into the earth, and is only manifest in the flames that he hurls from Mt. Etna. The repression of Typhoeus is an unconscious expression of the universal existence of human weaknesses and impulses that are incompatible with the external world, thus, they remain submerged in the earth like a "shadow" or double, the exact opposite of Zeus and his manifestations of power.

The second mythology has already been alluded to: the volcano is Hephaestus's (or Vulcan's) metallurgy workshop. There he works "amid smoke and sparks" aided by the Cyclops "whose single eye recalls, in allegorical form, the circular shape of Etna's glowing crater"(Krafft 1991, 16). In this myth, Hephaestus was said to have made the tools for Zeus with which he could control the world (Johnston 2005), and when fire flew from the volcano, it meant Hephaestus was hard at work. Here, quite contrary to the first myth, volcanic materials harbour such power that the highest of the Olympian gods can wield them for *control* over all other things, mortal and divine. If Typhoeus's volcanic flames are powerless protestations against his loss of control, Hephaestus's lava is the very opposite. In two different Greek myths, volcanic materials represent thwarted

power on one hand and triumphant power on the other. This triumphant power of Zeus can be easily related to the "god" archetype, for Zeus is the supreme god of Olympus and uses his volcanic tools to demonstrate his immortal strength over all existence.

The third myth is one that endures in the Christian era: that volcanoes are passageways to the Underworld, where dark gods live, and where many travel but few return. In Ovid's *Metamorphoses*, Pluto leaves the Underworld through Mt. Etna (Johnston 2005, 307). This myth indicates the physical location of the Underworld as within the earth's crust, and implies that it is a place of fire, molten rock, and heat. Volcanic material, in this last myth, surrounds the world of the dead. This is the Christian equivalent of hell, where the "devil" archetype exists comfortably in his realm of fire, pain, and damnation. By placing the devil in his own geographical location, human beings can safely separate him from the "god" archetype, and all that is good in the world remains clearly defined. Interestingly enough, the myth of Hephaestus and the myth of Pluto are at first glance psychologically incompatible - how can the volcano be both the workshop of Zeus's power (the place of "god") and also the portal to Pluto's inferno (the place of the "devil")? Jung's discourses on Christian symbolism may be able to shed some light on this issue: dualities are necessary to wholeness, and good and evil are of one and the same nature (Pennachio 1993, 243). Greek and Roman mythologies are not necessarily concerned with "good" and "evil" in the Christian philosophical sense, but placing both Zeus and Pluto in close proximity to a volcano reveals that these two images of positive and negative power can exist alongside one another.

Ancient mythology reveals the great extent to which humankind personifies nature, creating metaphors out of natural occurrences because man's world is merely a mirror reflecting his psyche. In this way the volcano in the stories outlined is not a volcano at all: it is human repression, power, and fear. In the modern Western mind, mythological characters are divine personifications of nature that reveal the human mind's basic perceptions of its surroundings. But to the Greeks and the Romans, mythology was theology, and Vulcan was not a personification of fire. Vulcan *was* fire.

Neither did fire exhibit a god-like power; it *was* that power, as alive as the flame that burned to honour it.

So when, in this psychological discussion, can we call a volcano simply a volcano? After all, the material existence of the earth is not a psychological fabrication, and we cannot ignore the physical presence of volcanoes in favour of calling them representative structures of the unconscious mind. While mythology reveals their archetypal natures, the very "thingness" of volcanoes can reveal something that perhaps lurks even deeper within the human psyche, but is by no means metaphorical. I am speaking of *existence* itself. In the next section I will explore the volcano as a non-metaphor, as a concrete *thing* that makes us recall the aspects of existence that cannot be explained in human terms. For "volcanoes are descended from prehistory for brains escorted away from history"(Ricuperati "Precise and Tolerant"), and by understanding the prehistoric origins of volcanoes, we may be able to understand, once and for all, what they truly are.

THE VOLCANO AS NON-METAPHOR: THAT WHICH EXISTS

A volcano is not a metaphor; it is a description of the world before man. But what is the world before man? How can we know of it? Religion has, throughout human history, attempted to describe the origin of the world and the nature of the human being's relation to it. There are thousands of these creation stories, many of them sharing similarities that Jung would attribute to the workings of the collective unconscious. Just as Jung suggests that the collective unconscious is formed upon the experiences of man during his most primitive existence, he too suggests that there is a part of this unconscious that extends beyond primitive life into the very creation of life itself (Madden 2003). What most interests me about this assertion, and what is most relevant to a non-metaphorical analysis of volcanoes, is the description of this "creation of the world" in the context of human interpretations of the cosmos, or, that which exists before the material world.

I would like to propose that within this section, rather than seeing volcanoes as portals to the abyss of hell, which ultimately must be a metaphor, they should be seen as portals to the cosmos, where formlessness, movement, and repose exist as the center of all creation (Layton 1987). This is where Jung's "the Self" archetype serves not as a *representation of* human life, but instead as the collective memory of *existence before the ego*. Jung argues that all religious impulses come from the memory of this pre-ego self, and that before a human being develops consciousness, this formless world without thought is a very concrete reality, its remnants visible to us only through our fabricated descriptions of the cosmos: "[t]he collective unconscious, inclusive of the ordering archetype of the Self, contains 'the images of all creation.' Before we become an ego, we are of this uroboric realm. Thus, the pre-ego contains the knowledge of the archetypes but in an uroboric or undifferentiated form"(Madden 2003). The ego, or consciousness, is responsible for separating archetypes into forms understandable to the human brain (hence mythologies that allow us to interpret the volcano in human terms), but the pre-ego leaves these archetypes drifting uncategorized, unthought, but existing there all the same. In the realm of the pre-ego, nothing is defined, separated, or conscious; everything inhabits an existence without definition.

This is exactly how Ricuperati defines volcanoes in Oppeneheimer's "Precise and Tolerant," suggesting that they belong to a realm of pre-thought within the highest philosophical order. He writes that "[volcanoes] are also shapeless antennae of what happens with the excuse of gravity: objects that need no language, need no glance, need no presences that have a conscience like the rest, like the rest of nature. [T]hey are not just a metaphor. Volcanoes are the proof that the earth has something specific in it that every so often it needs to get rid of"(Ricuperati "Precise and Tolerant"). Here, Ricuperati uses language very similar to Jung's description of the pre-ego world, calling volcanoes "shapeless," hinting that the gravity that affects them is purely coincidental, that they are unlike the rest of nature because *they do not need a conscience*, nor do they need a consciousness. Does the volcano, just like the pre-ego, contain "the images of all creation?" Or is it

that the pre-ego is alluding to "an uroboric or undifferentiated form" that can be understood through the geology of volcanoes? The uroborus, the esoteric symbol of the serpent who eats his tail, denotes "a primal state involving darkness and self-destruction as well as fecundity and potential creativity. It portrays the stage which exists before delineation and separation of the opposites"(Samuels 1986, quoted from Madden 2003). The volcano in all of its mystery and potential for destruction also lies at the center of this description, for within the volcano there are no separation of opposites, nothing delineated. To understand this you must imagine that pit of lava and rock that *is* all geological time.

Surely such a thing would be beyond human comprehension, and it is even more incomprehensible to think that, rather than *containing* the images of creation, volcanoes *are* the images of all creation. We have moved beyond metaphors and gone into an indescribable mystery: what is the image of creation? But this is precisely why, during the 19th century, the volcano was considered the epitome of the *sublime*, encompassing beautiful and frightening forces that reminded one of heaven or hell, or the unknowable realms, those places not accessible to the living.

Volcanoes are ancient rocks of fire, with powers still unmeasurable by modern science. The Jungian archetype of "the Self" allows us to understand that humankind's collective memory of the birth of our existence is one of circularity, formlessness, darkness, and light. The volcano holds within its primeval nature the memory of our creation, how all of life began. This is the closest way to describe life as a spiritual geology, for what scientist would argue with the profound existence of *rock* before life?

From here it is logical to move from formlessness into form. This process is called "art."

PORTRAIT OF THE VOLCANO AS AN ARTIST

I have already discussed the psychology of volcanic behaviour, the volcano as a metaphor, or a motif that reveals an archetype in Greek and Roman mythology, and the volcano as a non-

metaphor, a *thing* that is formless, mysterious, and ingraspable by the human mind. But the volcano is also a paradox, meaning that for every part of it that is formless, there is too a great form to all of its activities. This is not such a strange paradox, and indeed Hegel writes of "form following formlessness" in his essays that appear in "Aesthetics: Lectures on Fine Art." Hegel is quoted: "In the ordinary external and internal world essentiality does indeed appear too, but in the form of a chaos of accidents, afflicted by the immediacy of the sensuous and by the capriciousness of situations, events, characters, etc. Art liberates the true content of phenomena from the true appearance [. . .] and gives them a higher actuality, born of the spirit"(Hegel *Aesthetics* DATE, 9). The argument that *art* takes on the essence of chaos and gives it higher meaning, "born of the spirit," is merely one art theory that has prevailed in modern thought. But it is broad and simple enough to be interpreted in many ways, and it is possible to say, without corrupting Hegel's art theories, that the artist is responsible for giving form to chaos.

A volcano, in its paradoxical nature, is both formless and ordered, and it is the volcano itself that gives form to its own formlessness. In this way, the volcano is, philosophically, an artist, simply by existing as both a geological void and a physical form capable of emitting lava, gas, ash, and steam that can be seen and recorded by the human eye. An artist is primarily a creator, but most of our Western notions of the modern artist come from early 20th century Europe, where artists no longer relied on wealthy patrons for their survival and as a result lived in the great material poverty of the cultural underground. According to this very particular cliché, derived mainly from the artistic world in Paris, "the artist" is in a constant battle between the survival of his living body and his art. It is important to note, then, that the artist's private life and his artistic creations should not be separated in this context. Artists like Baudelaire, Rimbaud, Modigliani, and Van Gogh are famous examples of men whose creative genius endured beyond their corporeal life, which was cut short by madness and alcoholism. These private-life, self-destructive afflictions were not necessary to the creation of artistic works, but they often went hand in hand with them. When a volcano erupts, it

can create a marvelous spectacle of sublime imagery while destroying a part of its physical form. The 1980 eruption of Mount St. Helens was one such occurrence, when an explosive Plinian eruption emitted an ash cloud that rose to 27km in height and also blew off the tip of the mountain, creating a large crater on the north side.

Twentieth century writer and theorist Anaïs Nin divides artistic creations between the genders based on her personal observations: the male artist has typically tried to become like God to create his art, while the female artist's work must be exactly like her creation of children - it must come from her own flesh and blood (Nin 1967). The gendering of the volcano has been a particularly controversial subject among volcanologists whose interests in volcanoes extends to cultural worldviews. In psychological terms, both genders are represented within a volcano: a mountain that ejects materials may represent a phallis while a caldera may represent a womb, the cradle of the generative force. But if we are to apply Anaïs Nin's suggestions (curiously, Nin lived at the base of a volcano in Guatemala for a period of her life), we see that the "god" archetype returns in male artistic creation, while female artistic creation is profoundly *of herself.* Once again, both of these constructions exist in the volcanic dialogue: the volcano's association with the gods and the power it wields, as well as a womb-like crater through which all activity occurs. These two constructions exist both at the same time, even though they are opposites -- here we encounter yet another duality.

ALCHEMY: THE PRIMITIVE SCIENCE AND THE BIRTH OF THE VOLCANO

For many centuries before the creation of modern geology, and even before the 1970s when the theory of techtonic plates was confirmed as scientifically accurate, volcanoes have been understood from a purely emotional, subjective perspective. I have already suggested the extent to which volcanoes were the subject of those seeking the *sublime* in the 19th century, and also how they were powerful embodiments of hell and the unknown. Volcanoes are artists, conforming with

both Jung's theories of pre-ego formlessness and Hegel's proposition that art is chaos given form and meaning. But where do all of these conclusions meet with science? How can we reconcile the mythological, philosophical, and psychological interpretations of volcanoes with those devised by science? To answer this question, I turn once again to Jung, but this time using his writings in *Alchemical Studies*, to prove that alchemy, the earliest science, has paved the way for modern scientists in their study of volcanoes. For in alchemy, philosophy, magic, psychology, and science converge into one practice, and so a discussion of alchemy will bring my discussion of volcanoes into a concise and rounded picture.

A paraphrase from the Hermes "tractatus aureus," Mercurius speaking: I beget light, but darkness is also of my nature (Jung 1967, 125). Alchemy has traditionally been understood as an esoteric practice of transmutation. Alchemists were concerned with transforming base metals into gold, and mastering the composition of a "philospher's stone" that would bring eternal life to he who understands the stone. Throughout most of the history of alchemy, its practitioners have suffered ridicule from popular culture, evident in satirical literary references since before the medieval age, for attempting to accomplish divine impossibilities. Stanton Linden, in his article "Francis Bacon and Alchemy: The Reformation of Vulcan," summarizes how alchemists have been generally viewed throughout history: "[o]n the one hand, the alchemist might be associated with the Renaissance magus, the possessor of forbidden and occult knowledge; on the other, he might be pictured merely as the crack-brained seeker after the philosopher's stone, the elixir of lfe, and other *ignes fatui* of the human mind"(Linden 1974, 548). This is how the allure of alchemy has survived into the modern age: it is both an esoteric secret (something that has always attracted the Western mind) and an anachronistic pseudo-science.

Some alchemical descriptions have very distinct allusions to volcanic activity, although never within these texts are the allusions so clear that one may safely assume they refer to volcanoes themselves. In fact, most allusions refer explicitly to the images and symbols that concern

them, like a tree or a stone. The point is, however, that such references seem to ignore the visible properties of the *tree* or the *stone* and instead attach to them colours and properties more logically associated with volcanoes. For instance, in Jung's study of the images of "The Philosophical Tree of Life," one such image is described as a vessel through which "living blood" flows in and out in all its transformative power:

> "The tree nymph carries the sun and is a figure composed of light. The wavy band in the background is red, and consists of living blood that flows round the grove of transformation. This indicates that the transformation is not just an airy fantasy, but is a process that reaches *down into the somatic sphere or even arises from it*"(Jung 1967, 262 italics mine).

Jung describes that the transformation brought about by such "living blood" is a very concrete, material process that extends down into the bodily realm and perhaps rises out of it, just as lava exists within the natural form of the volcano and rises out of it in eruption. The colour "red" and the word "flow" also recall the properties and actions of a volcano and not a tree. But the tree, here, is not a tree at all -- it is the metaphorical, sacred tree of *life*. It may be possible to conclude, then, that the understandable properties of volcanoes have been fitted to "the tree of life" in order to give it a greater active power. I do not claim to know the secrets of alchemy; I am merely suggesting that the language of alchemical texts unconsciously invokes volcanic images, as if the properties of *stone*, *red*, *blood*, and *flow* exist at the heart of the mystery.

Psychically, alchemy is the innate human impulse to control that which cannot be controlled. A master alchemist, presumably, is immortal, and has gathered enough power within him to create and control the elements. In essence, he is God. He is Vulcan crafting divine tools out of magma. Jung asserts that alchemy is both an early science of the elements and a philosophy that could transform the human psyche. The true power of alchemy, or its true purpose, rested not in the many attempts to make gold or a stone of eternal life, but it was actually this *psychic transformation*, which was accomplished through alchemical teachings relating *stone* to Christ (Jung 1976, 127). The alchemists tried to master the various properties of *stone* in order to bring out of it a sacred

light -- if the *stone* is Christ crucified, as the alchemists believed, then it is clear that a mastery of *stone* is a mastery of Christ, and ultimately God himself. This is where Jung sees the beginning impulses of modern science and the Age of Reason, which slowly demoted God and promoted human rationality: "[m]edieval alchemy prepared the way for the greatest intervention in the divine world order that man has ever attempted: alchemy was the dawn of the scientific age, when the daemon of the scientific spirit compelled the forces of nature to serve man"(Jung 1967, 127-28). Jung is suggesting that the scientific age is really an era of God-playing, seen in its most primitive form through the development of alchemy, where the sacred and the material first met to discuss the terms of their agreement.

Philosophical alchemy, on the other hand, is concerned with wholeness: "The alchemical operation consisted essentially in separating the prima materia, the so-called chaos, into the active principle, the soul, and the passive principle, the body, which were then reunited in personified form in the *coniunctio* or 'chymical marriage'"(Jung 1967, 122-3). This description lies dangerously close to both Jung's description of the pre-ego primordial cosmos and Hegel's suggestion that the ordering of chaos in a spiritual manner is what we call "art." The active and passive principles that rest in the soul and the body can be seen in volcanic activity, if we can call the active nature of lava the volcano's soul, and the passive nature of its geological form (that which *is acted upon by other forces*) its body. This would mean that the volcano, in a philosophical sense, is perhaps the only successful alchemist -- luckily, in this case, science would not disagree.

In 2009 the National Science Foundation published an artivle called "Alchemy in Tanzania? Gas Becomes Solid at Surface of Oldoinyo Lengai Volcano." This article claims that the Oldoinyo Lengai volcano in Tanzania is unlike any other volcano, for it erupts in bursts of solid carbon dioxide called "carbonatites." According to the National Science Foundation, "[c]arbon dioxide completely 'disappears' into the atmosphere at all other volcanoes on earth"(NSF 2009). Where most volcanoes emit carbon dioxide in its gaseous form, Oldoinyo Lengai is the only volcano that converts

this gas into a solid. The author of the article has used the metaphor of alchemy to demonstrate the volcano's miraculous transformation of natural elements into the unknown, or at least the unexpected. And this is, indeed, the closest thing to alchemy in the natural world. Based on my previous analysis of alchemists as early scientists set out to control their own nature and the natural world, imitating their very own concept of God and attempting to master Christ through material matter, I would like to add that alchemists attempt, unconsciously, to imitate volcanoes, the truly successful alchemists. Ironically it is science that proves to us how the Oldoinyo Lengai volcano creates this rare solid carbon dioxide (a mixture of high sodium content and gases that come from the upper mantle of the earth's crust), and indeed through scientific processes did the carbon dioxide gas change its form quite uniquely in Tanzania.

CONCLUSION

Early twentieth century psychology can be defined as the science of the symbolic language that the human mind speaks in response to its surroundings: it is manifest (the conscious) and it is hidden (the unconscious). At the heart of every discussion of Jung's is one basic principle: that the unconscious mind creates symbols that can be interpreted in a universal manner. Such a profoundly simple statement encompasses practically every pocket of human culture (art, religion, science, media) so that it becomes possible to analyze anything from a symbolic, psychological perspective. I have demonstrated the truth of this statement by applying the many theories and writings of early psychologists to an analysis of volcanoes, covering a broad range of topics from general psychological theory, behaviour studies, myth, existence, art, and alchemy.

But if I have concluded that *psychology* can be used to understand the basic constructions of human life, I would also like to suggest that my analysis of the volcano within this context is not purely random or coincidental. Instead, the behaviours, forms, and very existence of volcanoes on this earth, when discussed in a psychology perspective, help illuminate some of the mysteries of the

human mind. This is most evident in my discussion of the volcano as a non-metaphor, or, the physical embodiment of the memory of creation, for Jung suggests that the mind's pre-ego is a collective, lost memory of pre-existence, something that seems profoundly spiritual and yet is based in both psychological sciences and the scientific cosmos. This interpretation cannot necessarily be ignored when we compare it to the early metaphorical mythologies that place the volcano in the realm of the gods. For these myths are expressions of archetypes, universal acknowledgements of human qualities that reveal a human being's understanding of the world around him. Why should a volcano *not* be a god, then? This, now, is a matter of opinion - I can only present you with a certain amount of evidence and suggest that the question remains open to debate.

EXPERIMENTAL DEVIATION: VOLCANOES AND THE RORSCHACH

Six images taken from Google Earth of three volcanoes (Kliuchevskoi in Russia, Sakura-Jima in Japan, and Tingurahua in Ecuador) are displayed here as Rorschach images. Because I am interested in creating a "psychological language" for the volcano, a short but essential component to this paper is the following series of interactive interviews designed after the Rorschach inkblot tests. The images I use have been doctored, and they are satellite images of volcanoes and volcanic activity. Those who responded to this interview were not aware that each image is "volcanic." In this way I have engaged people to speak freely about volcanoes, and they have assigned a certain meaning to them without bringing preconceived ideas of volcanoes into their dialogue. If Freud and Jung offer perspective on the basic psychological framework of behaviour and neurosis, the Rorschach studies offer a particular way to assess personality based on visual/verbal associations.

As this is not an extensive scientific study, it was done simply as a creative deviation that might reveal something unexpected about volcanic imagery. I have pointed out interesting patterns that occurred however with certain images and the participants of this "study." I hope they prove to be interesting and provide some kind of enjoyment as well. The images begin on the next page.

1.) KLIUCHEVKOI, CENTRAL KAMCHATKA, RUSSIA

IMAGE ASSOCIATIONS:

a. A woman being chased by people with spears (noted: an "unhappy" woman).

b. Vase of flowers in sunlight.

c. Carnival clown mask with big radiating feathers around the face.

d. Shaman in a jaguar suit.

In my opinion, this was the first and most successful image that I altered to look like an inkblot test. The answers are very abstract, and yet there is a tribal similarity to three of them: in the answers of participants (a.), (c.), and (d.). The spears, feathered mask, and "shaman in jaguar suit" all recall some sort of primal rite.

2.) KLIUCHEVSKOI, CENTRAL KAMCHATKA, RUSSIA

IMAGE ASSOCIATIONS:

a. A peanut can with snakes coming out of it.

b. Cells under a microscope.

c. Cells that look like shrimp in water.

d. Count Basie

Participants (b.) and (c.) both thought that this photo looks like cells, presumably microscopic in both cases, although (c.) seemed to think that these cells were shrimp-like. No participants spoke to each other during this process and all interviews were done in different locations at different times, so it should be concluded that because two people independently came up with the same conclusion, there might be some truth to its visual projections. I cannot account for participant (d.)'s explanation of "Count Basie."

3.) SAKURA-JIMA, JAPAN

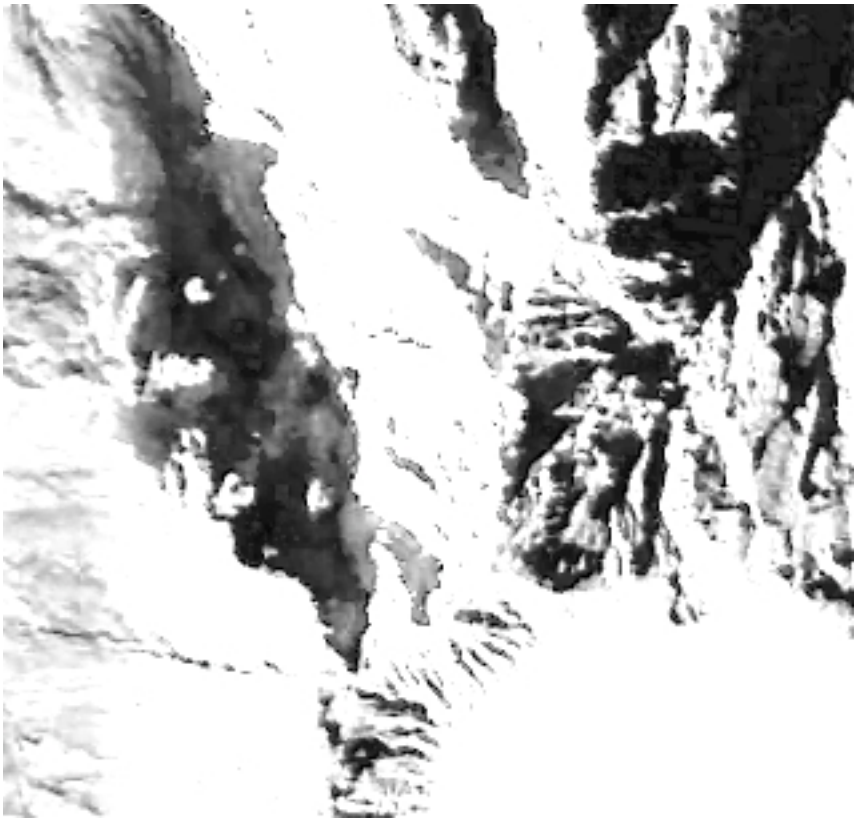

IMAGE ASSOCIATIONS:

a. Mountainside with skiiers.

b. A face on the left staring at a glacier.

c. A quarry.

d. A canyon.

In this photo, it was evident to all participants that this depicts some kind of geological form, where three people responded with something of "rock" and one responded with something of "ice." Participants (a.) and (b.) also included human beings in this picture.

4.) SAKURA-JIMA, JAPAN

IMAGE ASSOCIATIONS:

a.) The Grand Canyon.

b.) A rabid boar running.

c.) A sleeping alligator, mirrored against water.

d.) Mountainside in snow (late spring).

Once again we see the return of mountains and canyons, and this time animal imagery from participants (b.) and (c.). It would be interesting to note at this point that participants (a.) and (d.) are male while (b.) and (c.) are both female.

5.) TUNGURAHUA, ECUADOR.

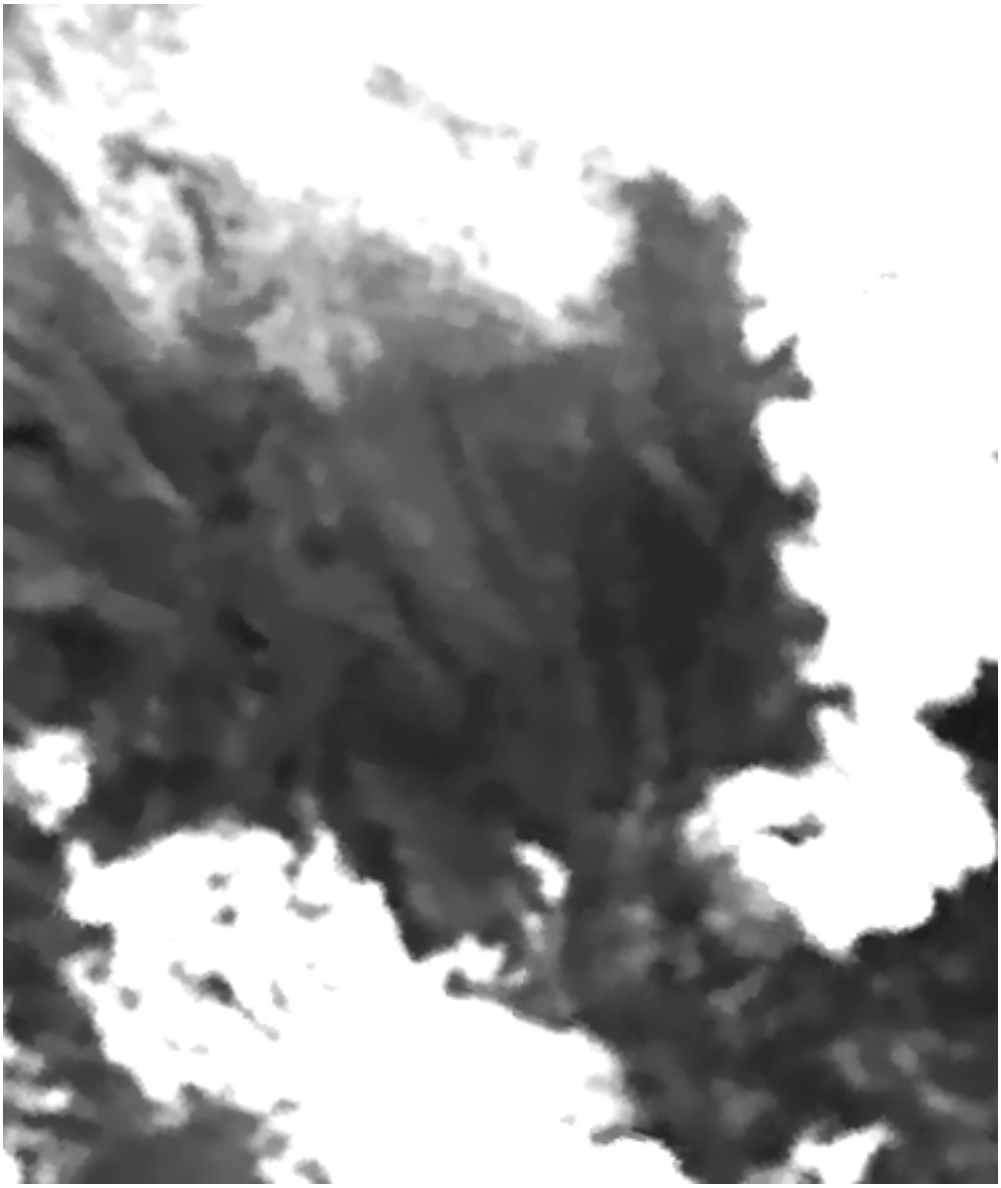

IMAGE ASSOCIATIONS:

a.) The abyss of hell.

b.) A black worlf carrying something white in its mouth.

c.) A wolf's head.

d.) Aerial map of an oil plume at sea.

The two female participants, (b.) and (c.), once again see animal imagery, this time very distinctly a wolf's head. The male participants (a.) and (d.) both see images of hell, if an "aerial map of an oil plume at sea" can be considered a metaphorical hell.

6.) TUNGURAHUA, ECUADOR.

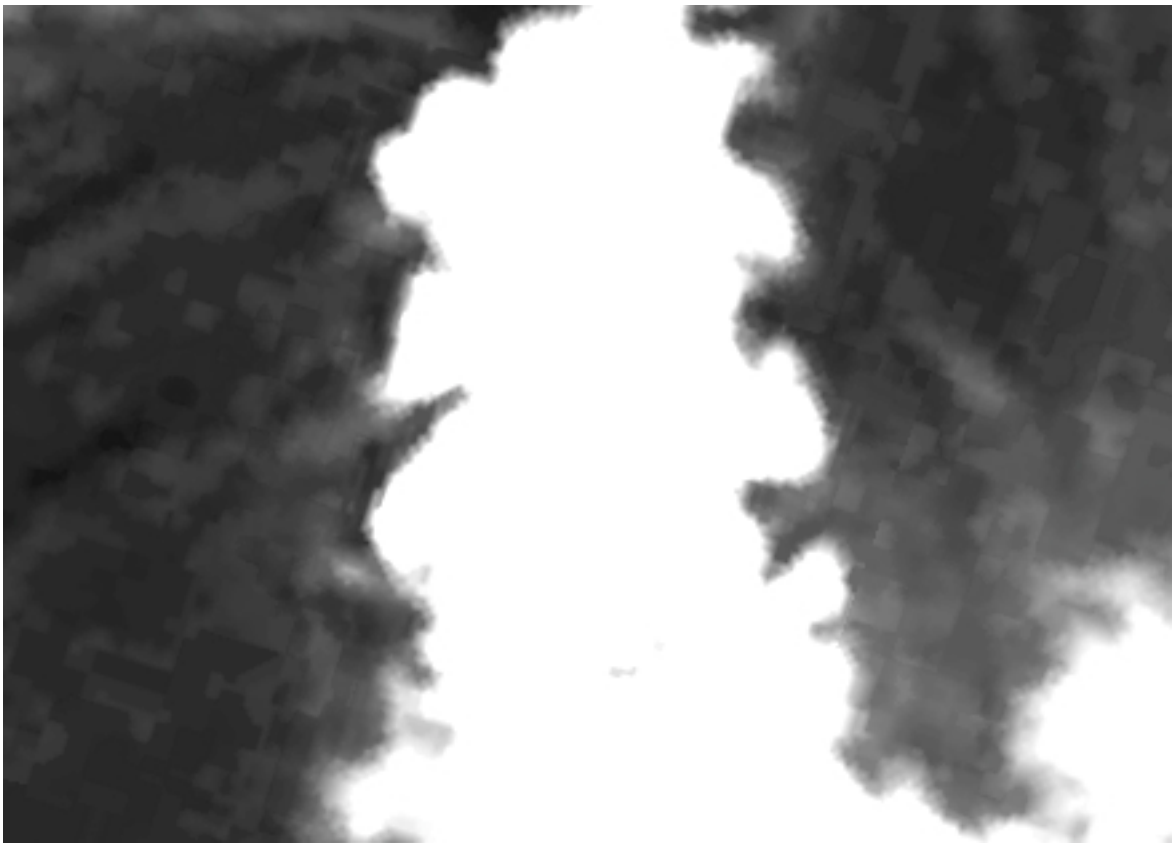

IMAGE ASSOCIATIONS:

a.) An x-ray of a spine.

b.) Looking out from inside a cave on a sunlit ocean.

c.) A "zoom-in" of something like a venus fly trap opening, with light behind it.

d.) A Rorschach of two crones back-to-back.

Participants (b.) and (c.) both noted the presence of light in this picture, while (a.) and (d.) both saw the white portion of the image as something concrete - either an image of a spine or a drafted picture (an inkblot test, in fact) of two old women standing with their backs to each other.

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