



## **Neurochemical Effect on Creativity of the Romantic Writers: A Theoretical Framework of Econeurochemical Critical Reading**

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### **Abstract**

All the living beings are neurobiologically driven beings. Creative writers and artists are no exception to it. We as literary critics, think that creative writers and artists are also living beings and they are mostly driven by neuro-chemical reactions in the brain. In the world of neurology, each body and the parts of the body are the cause of all the information received by the neurons and through certain processes, they are revealed in the form of Human behavior. Creativity is one of the human behaviors which is mostly governed by neuro psychological impacts of the external world. The paper argues for this kind of neuro chemical reactions, processes, and knowledge receptions as subject matters of romantic poets. The romantic poets were deeply influenced by the French Revolution, and Tambora eruption effects. The paper presents how these effects were received by the poets neurologically and being under some certain neurotransmitters and neuromodulators like norepinephrine (NE) and Epinephrine, Histamine, and Serotonin, and how they could use a specific kind of diction which is conceptualized as “Climatoglossia”. Climatoglossia is defined for interpreting used images and symbols concerning severe shifts in the climate of Europe and Britain as reflected in the select poems of Byron, Shelley, Campbell, and Keats.

**Key words:** Climate Change, Climatoglossia, Ecocriticism, Environmental Humanities, Neurocognitive literary studies, Neurochemical and Creativity, Romanticism.

## **1. Introduction**

Imagery in Romantic poetry is examined in terms of visual descriptive imagery of nature and natural phenomena. There are plethora of critical works studying natural beauty in Romantic poetry, but this paper argues for studying neurochemical reactions to upbring a new creativity under the post-Tambora eruption effects and climate change in select poems of Romantic poets. The global climate change and cooling temperatures induced by the eruption of Mount Tambora (1815) heavily influenced major works of the Romantic era. The poets under its influence used unique images and symbols to reflect apocalyptic anxiety, Year Without a Summer, volcanic winter, reduction in global temperatures caused by volcanic ash (tephra), and glass mirroring, an unforgettable severe climate change. For addressing anxiety and distress, the poets have used images and symbols in the select poems.

The paper is an intersectional study of basic neurochemical transmitters, poetry, climate change, and ecology. It aims to trace the neurochemical transmitters that received the effect of the French Revolution and Tambora eruption effects in Romantic writers. Its major impact is traced to their inclinations towards Nature and fondness of isolation letting them enjoy an escapist mindset. Under this impact, the ecological words are often used by the Romantics. For addressing isolation, suffering, sadness, melancholia, anxiety and distress, the poets have used images and symbols in the select poems.

## **2. Basics of Neurochemical Transmitters, Consciousness and Creativity**

Otto Loewi's groundbreaking experiments, which were themselves motivated by a dream, first introduced the idea of chemical neurotransmission in the 1920s (Neuroscientifically Challenged). He showed that by transferring the ventricular fluid of a stimulated frog heart onto an unstimulated frog heart, he could mimic the effects of a (parasympathetic) nerve stimulus on the unstimulated heart (Neuroscientifically Challenged). It was later discovered that the neurotransmitter produced from these parasympathetic nerve fibers was acetylcholine (Neuroscientifically Challenged). A crucial function in vertebrate neuromuscular junctions and the autonomic nervous system's synaptic transmission. And acetylcholine plays pivotal role in the control of wakefulness and REM sleep. Some have even gone as far as to call acetylcholine “a neurotransmitter correlates of consciousness” (Perry et al 26). The brain contains between 1 billion and 100 billion neurons. A cell body, dendrites, and an axon make up a neuron. The nucleus and cytoplasm are found inside the cell body. The electrically excitable axon spreads from the cell body and, before reaching the nerve terminals, frequently gives rise to numerous smaller branches (Axon). To communicate with other neurons, dendrites extend from the cell body of the neuron. Synapses are the places of contact where two neurons can interact. Synapses formed by the tips of other neurons' axons cover the dendrites and cell body (Pickel and Segal).

Axons, which can be as short as a fraction of an inch or as long as three feet or more, are the pathway through which neurons transmit electrical impulses as a means of communication (Axon). The multilayer myelin coating that covers many axons helps to speed up the passage of electrical signals along the axon (Axon). In the brain and the peripheral nervous system, this sheath is composed of specialized cells termed oligodendrocytes and Schwann cells (Axon).

Ion channels, which are water-filled, selectively permeable molecular tunnels that pass through the cell membrane and permit ions—electrically charged atoms—or tiny molecules to enter or leave the cell—are involved in the opening and closing of nerve impulses (Ramachandran 1-12). The movement of these ions generates an electrical current that results in minute voltage variations across the cell membrane of the neuron(1-12). The difference in charge between the interior and outside of the cell determines whether a neuron can produce an electrical impulse (1-12). At one location on the membrane of the cell, the electrical potential dramatically reverses as a nerve impulse starts as the neuron changes from an internal negative charge to a positive charge state (1-12). The alteration, known as an action potential, then travels at velocities of up to several hundred miles per hour along the axon membrane. A neuron may be able to fire impulses numerous times per second in this fashion.

These voltage adjustments cause neurotransmitters, the brain's chemical messengers, to be released at the end of an axon. Nerve terminals produce neurotransmitters, which then diffuse throughout the intrasynaptic region and bind to receptors on the target cell's surface (Wetmore et al. 2238-2239). The subsequent cell uses these receptors as on-and-off switches. Every receptor has a distinctively formed area that can recognize a specific chemical messenger only (Wetmore et al.). Like how a key fits into a lock, a neurotransmitter can be found here (Wetmore et al. 2239). Additionally, when the transmitter is present, this interaction modifies the membrane potential of the target cell and results in a response, such as the production of an action potential, the contraction of a muscle, the stimulation of enzyme activity, or the inhibition of neurotransmitter release from the target cell.

Thus, every brain activity is conducted by a neurochemical (Siegel, 9), which is a tiny organic molecule or peptide. The roles of these neurochemicals are studied via neurochemistry. A body cannot operate without chemical messengers called neurotransmitters. They are responsible for transporting chemical "messages" from one neuron (nerve cell) to the subsequent target cell (Perry et al. 26). The following target cell might be a gland, muscle, or another nerve cell. The monoamine neurotransmitter norepinephrine, sometimes referred to as noradrenaline, is involved in arousal, pain perception, executive function, regulating body temperature, and other activities (Perry et al.). Adrenaline, also known as epinephrine, is a monoamine neurotransmitter that participates in the combat response and elevates blood sugar levels while also increasing cardiac output, blood supply to muscles, and dilated pupils (Perry et al.). Serotonin is a monoamine neurotransmitter that regulates a variety of functions, including hunger, mood, sleep, and body temperature. Monoamine neurotransmitter histamine is involved in arousal, pain, regulating body temperature, and hunger (Perry et al.). *Neurochemistry of Consciousness: Neurotransmitters in Mind* (Perry et al. 26) gives basic understanding of the major systems that irrigate the cortex with neuromodulators and neurotransmitters, like noradrenalin, serotonin, dopamine, acetylcholine, etc. and how they are implicated with consciousness. Neurochemicals affect human consciousness (Perry et al. 26), and creativity is affected by consciousness (Khalil 2019, Rahaman 2020). Creativity is an individual's ability to produce works of art such as novels, poetry, drama, and prose to reflect socio-cultural contexts.

### **3. Ecological Impact on Creative Neurochemicals: Subject of Neurocognitive Studies**

Creativity is a sign of mental health and emotional well-being. It has a promising potential to heal the creator's suffering. It is a multifarious construct involving plural processes, dichotomies, and

conditions. Neurocognitive literary studies focus on the relationship between neurochemistry and creativity (Rahaman) have also been connected to ecology. The term ecology is derived from the Greek words *oikos* which means “household,” and *logos*, meaning “study” (Smith and Pimm). Thus, “the study of the environmental house includes all the organisms in it and all the functional processes that make the house habitable” (Odum and Barrett 2). In simple words, a confederation of the biological components of the environment with the physical ones is Ecology (Ecology). There are various types of ecology: “Terrestrial” and “Marine” ecology deal with the interaction of terrestrial and marine animals with their respective environments (Webb 535-41), Microbial ecology examines how microbes mediate a lot of organic and inorganic processes essential to the working of biosphere and their interaction with humans and other substrates (Kirchman 2-9); Human ecology tends to deal with sub-social phenomena and the relation of humans with their physical universe (Hawley 398-405; Park 1-15); Conservation ecology studies management of biodiversity via different methods for the functioning of ecosystem (Schwartz et al.; Brussard 6-12); Population ecology deals with the structure and dynamics of population (Rockwood) and Climate ecology refers to the study of alterations in global or local climate, its influence upon humankind and their response to it (Root and Schneider 334-41). Since Literature reflects human and post-human conditions and discourses, it encapsulates the impressions of ecologies in it. This relationship between literature and the ecological themes present in it paves way for “Literary ecology” as analyzed by Cheryll Glotfelty and Harold Fromm in *The Ecocriticism Reader* (1996). To clarify this intersectional knowledge system, William Rueckert wrote “Literature and Ecology: Experiment in Ecocriticism” (1978), Carl Kroeber “Home at Grasmere: Ecological Holiness” (1974), Jonathan Bate *Romantic Ecology: Wordsworth and the Environmental Tradition* (1991), Raymond Williams wrote *The Country and the City* (1973), and

Laurence Coupe edited *The Green Studies Reader* (2000). These are some publications which established this mode of literary thinking. Lawrence Buell's *The Environmental Imagination: Thoreau, Nature Writing, and the Formation of American Culture* (1995) finds new ways to understand nature-human relationship, the place of nature in Western intellectual thought and reassessment of literary and cultural considerations on nature with Henry David Thoreau's *Walden* (1854) as yardstick. Moreover, Enlightenment literature and romantic literature reflect these ecologies in their works. Among them, Thoreau's *Walden*, Wordsworth's poetry, and Emerson's essays are best suited examples, but the problem is that there is no such theory as to explain systematically how to trace climate imageries in literature and how natural calamities and related frightening tales and narratives can be studied in terms of climate and climate change discourses. Hence, seeing its necessity, this paper studies Romantic literature in terms of climate ecological principles, catastrophes and post-Tambora effects with an outcome to be known as climate literary theory.

#### **4. Intersectional Literary Criticism: Climate, Climate Change and Literature**

Intersectional literary criticism started from literary critical practices of Matthew Arnold (1822-1888), Sigmund Freud (1856-1939), I.A. Richards (1893-1979), William Empson (1906-1984), and Northrop Frye (1912-1991). Climatoglossia is the result of such an intersection of Literary study with atmospheric science. Atmospheric science is an intersection of physical and chemical studies to study the earth's atmospheric structure and its dynamics (Pielke). It is an interdisciplinary field of study and is divided in three parts: "Meteorology" which studies weather forecast, "aeronomy" which studies physical and chemical components of the upper atmosphere, and "climatology" which studies long-term atmospheric patterns of a region.

Climate of a region is studied in Climatology (Pielke). Climate is defined in terms of the atmospheric conditions like temperature, pressure, humidity, speed of wind, direction of the wind, solar radiation, and precipitation (frequency, amount, and type) of a particular zone which are observed and documented over a lengthened period, up to 30 years unlike weather wherein these aforementioned factors are documented on day-to-day basis (Rafferty 1). Earlier, the definition of climate has been limited to the induction of numerical means of weather which is not the case in present day climatology. The modern definition of climate includes average weather, variations, different occurrences, and various other phenomena (Rohli and Vega 3-6). A change or variation may occur in the climate of a region because of man driven activities or certain natural events. To this modification scientists call “climate change” (Rafferty 1). Rapid industrialization, burning of fossil fuels which release greenhouse gases like carbon dioxide and methane and other developmental activities in the present times are the prime causes of climate change (Hardy 3-20; Park 196-198) which ultimately have a direct negative impact on human life, agriculture (Hardy 117-28; Mendelsohn et al. 753-71), forest (Hardy 112), water (77-95), sea-level (132) and economy (Hamilton et al. 245-54). Climate change influences our mental health too (Susanta: 3). Scientists estimate that climate change causes forced migration because of its adverse effects resulting in an increased population of “climate refugees” or “environmental refugees” (Ahsan et al.: 1-15). On the other hand, nature-induced climate change is also responsible for the shifts in climatic conditions of the earth. Volcanic eruptions (Robock 191-95) and variations in the earth’s orbit (Raymo and Huybers 284-85) are major sources of natural climate change. Five major ice ages are examples which can help us to understand the role of nature in climate change.



The Merriam Webster Dictionary defines literature as “writings in prose or verse especially writings having excellence of form or expression and expressing ideas of permanent or universal interest” (Literature). However, this definition of literature is surrounded by controversy that if other forms like oral literature (not transcribed), films, essays or graphical illustrations can be included in the conventional understanding of literature as an art form. The definition of literature which includes memoirs, letter collections, history, learned treatises, et cetera as well as poems, novels, and plays (printed) came only after Samuel Johnson’s dictionary in 1755 (Miller 13-14). The restricted sense of literature as: comprising of poems, plays, and novels is even more recent (13-14). However, in all the forms be it poetry, drama, prose, films or the letters, a major portion of literature is inspired by some outside events happening in real life. Literature echoes human life and what happens in it. It is defined in terms of imitation (Simpson 279-91) and direct impression of life (James). Its function lies with “sublimity” (Longinus) and gaining insights to the truth (Emerson). For example, there is tremendous impact of French revolution on the poetry of William Wordsworth, William Blake, and Samuel Taylor Coleridge (Ferber 108-09; Ostle 93-94). Thus, climate change, a global event with disastrous consequences for humankind is assuredly going to influence the literary writings and these consequences are portrayed by the writers in the plot, subplot, metaphors, or imagery.

### **5. Neurotransmitters Impressions on the Uses of Literary Devices**

Literary devices are the means for writers to express their beliefs and ideas, communicate meaning and accentuate significant themes in a text. There are various literary devices like Assonance (Dupriez 72), Flashbacks (189-91), Hyperbole (215-16) and Metabole (274). A most used literary device which is very central to poetry is ‘Imagery.’ Imagery appeals to the senses of

the readers via highly descriptive and symbolic language and strong imagery instantaneously paints a visual/mental image in the mind of a reader (221). Images have a symbolic significance and for a brief period, they assign a second meaning to the text, which is not literal but analogical, symbolic, or metaphorical (222). There are diverse types of imagery: Literal or Descriptive imagery describes things as they are without attempting to convey any symbolic or hidden meaning (Riffaterre 107-10), Color imagery pertains to the visualization of colors mentioned in a text and physically out of the sight of a reader (Doak and Doak 208-10) and Auditory imagery pertains to music, noise, and different sounds (Reisberg 1-5). Additionally, there is a wide range of imagery discourses explored in various research papers, for instances, “dream imagery” (Herndon 538-45), “funeral imagery” (Chandler 239-50), “clothing imagery” (Rose 29-44), “eye imagery” (Newton 694-712), “sexual imagery” (Berry 301-16), “apocalyptic imagery” (Malloy 82-95), “moon imagery” (Koprince 14-17), “circular imagery” (Boies 350-55), “battle imagery” (Manheim 129-35), “animal imagery” (Cohen 164-80), “fire imagery” (Hurst 236-37), “musical imagery” (Weber and Brown 411-26), “reflexive imagery” (Keach 49-69), “jewel imagery” (Patterson 495-520), and “mirror imagery” (Lasser 274-77; Spector 85-107).

All these types of imagery are present in literature and researchers have studied them extensively, but the “climatic imagery” is often neglected or conceptualized with illustrations of the other forms of imagery. The consequences include:

- a. Overshadowing of the significance of climatic imagery
- b. Gap in scope of studying the nature of the climate, its variations (climate change) and human interaction with it.

### **Climate Imagery: Concept**

Climate imagery in the simplest of words is defined as the images formed in the mind of a reader when the reader studies the descriptions of climate in a work of literature, the changes it undergoes (climate change), the interaction of characters with their climate, and their response to the variations. Climate imagery is paid less attention when we study climate in the visual descriptions of natural imagery as there are only descriptions of the climate (good and bad). There is a need to study climate imagery independently so that it does not lose its significance.

In amalgamation with the other types of imageries, climate imagery loses its significance as we only study the descriptions of the climate. The researchers only assess the images and neglect the relationship between man and climate in a text. They barely evaluate the variations in climate and the response of characters to such variations. Thus, there is a need to put forth climate imagery and approach it independently for a better understanding. Climate imagery tends to include picturization of climate, climate change, human interaction with the climate, and their response to it. It could be studied via sounds of events like thunder, rain, volcanic eruptions, winds, and characters interacting with such forces of nature. In addition to it, the color of vegetation in the setting, subjective experiences of a character like hunger because of draught and movement of animals, vegetation, flowers, human displacement could help in studying climate imagery. Moreover, smell of flowers, breeze, air quality, smog can all help us to put forth climatic imageries and approach them independently.

The reflections of climate in a particular text are often inspired by conditions around the authors and poets and they are helpful in conducting climatic assessment of the age a text is written in. These climatic assessments are important for the future of humankind to opt for

developmental models and frame policies which can rectify the previous mistakes or aid in continuing the suitable ones. Climate imagery, thus, serves the higher purpose of assistance in climatic assessment of a region via literature that is produced there and ultimately serves as a bedrock for Environmental Humanities.

### **Climatoglossia**

Climatoglossia is the result of neurochemical impacts of shocking implications of Tambora eruptions. Romantic poems, written after the Tambora eruption, are full of imagery related to the climatic conditions but at the same time, there are plentiful words and phrases referring to the climate and climate change. The words and phrases that allude to or serve as a direct reference to the climate or climate change in a literary work are classified as Climatoglossia. It simply means a glossary of climate inspired diction in literature. Climatoglossia governs the meaning and helps us to understand the type of climate being discussed in a text. It determines the existence of climate consciousness in human society in a text. Authors employ climatoglossia in order to instill climate awareness in the mind of the readers. There is a diversity in the usage of climatoglossia as the words/phrases can either be completely scientific (names of the phenomena or beings) or poetical. Climatoglossia serves as a bedrock for intersectional literary studies that connect atmospheric science to Literary texts.

Examples cited below like “glaciers creep,” “fading fire,” “darkness,” “air was cooling,” “pale,” “vivid light,” “massy,” “grey,” “blackening,” and “imprisoned ray” and so on set out as examples of Tambora effects in the Romantic poetry. These examples present the climate change witnessed during the period 1815-1819 and are classified as Climatoglossia.

### **6. Tambora Effects through Climatoglossia in Romantic Poetry**

German Romanticism is the precursor of the Romantic movement in England (Seyhan 1). There had been a slow development of the movement for an extended period before it turned into a revolution in the 18th century (Furst 31). The poets associated with the Romantic movement have often been called 'nature poets' who describe the beauty of nature, worship it, and call for going back to nature (Peckham 6). They preferred emotion over reason and pushed the boundaries of art (Barzun). They believed imagination to be fundamental to poetry and their stress upon the imagination was strengthened by religious and metaphysical considerations (Bowra 1-2). Natural imagery in the case of Romantic poets has been studied by researchers extensively, however, after the eruption of Mount Tambora (Wood) in 1815, there was a drift in the imagery employed by the Romantic poets. The images of the beauty of nature were overpowered by the images of Tambora induced climate change in 1816 when the world witnessed negligible sunlight (Stommel and Stommel 7-8), climatic disasters, cooling temperatures (particularly in Europe and North America), crop failure, and a complete year without a summer (Stommel and Stommel 176-87; Skeen 51-67). The effects of the eruption lasted for two or three years (Post) and it was only after that, the climate started to stabilize. Spring arrived much later as there was not enough sunlight but rain, hailstorms, and snow during the summer (Boers 51-53; Charles River Editors).

Mary Shelley and P. B. Shelley in their travel narrative *History of a Six Weeks' Tour*, published anonymously, describe two trips the first one taken by Mary Shelley with her stepsister Claire Clairmont across Europe in 1814 and the second one by P. B. Shelley and Mary Shelley to Lake Geneva in 1816 where they met Lord Byron. Tambora effects were experienced by the poets Lord Byron and P. B. Shelley in Geneva. It influenced their poetical works at that time. Those changes also led to the creation of one of the greatest English novel Mary Shelley's

*Frankenstein* (Higgins 55-59). The climatic conditions at the time of the writing of *Frankenstein* are traced in the novel identically. The scenes are dramatized based on the changing weather (68-75). This environmental darkness post Tambora eruption pictured in the novel is manifested throughout the romantic poetry.

Lord Byron's "Darkness" (1816) expounds the severe shift in the climatic conditions post Tambora eruption. He dreams of the sun growing out of fire which has led to the stars roaming in the darkness of this everlasting universe. Byron further says that the planet earth because of this phenomenon has darkened and stands without any path to follow. It is cold and icy floating blindly in the darkness of the cosmos. Though the morning is conventionally engaging in its course of action, it is unable to bring out the day:

I had a dream, which was not all a dream.

The *bright sun* was *extinguished*, and the stars

Did *wander darkling* in the eternal space,

*Rayless* and *pathless* and the *icy earth*

*Swung blind* and *blackening* in the moonless air.

Morn came and went and came, and *brought no day*. (Byron 468) (Authors' Italics)

Lord Byron's *Manfred* (1816-1817) Act I, Scene I talks about the death of the sun comparing it with a lamp which he says will not burn for a longer period. This is a direct reference to the fading of sunlight in 1816 post Tambora eruption.

The second part of Byron's *The Prisoner of Chillon* (1816) paints the picture of Chillon's dungeon in which the narrator of the poem and his brothers are imprisoned. The setting of the

scene is again a reference to the meager sunlight present throughout the summer of the year 1816 which came to be known as “Year Without a Summer.” It was a direct repercussion of mount Tambora. The poet describes the dungeon as “deep,” “old,” “massy” and “grey” which represents the image of the earth (inhabitable) in the absence of decent amount of sunlight. Percy Bysshe Shelley’s “Hymn to Intellectual Beauty” (1817) asks why there is no sunlight to weave rainbows over the mountains and rivers of the poet’s state? Why should the season of summer fade and fail to arrive in the state that the poet used to witness earlier? John Keats’ “I Stood Tiptoe Upon a Little Hill” gives a direct reference to the cooling and lower temperatures of 1816 as the year is known to be the second coldest year in the Northern hemisphere since 1400. “I stood tiptoe upon a little hill; The *air was cooling* and so very still.” (Keats 14) (Authors’ Italics).

The composition of Lord Byron’s “Prometheus” (1816) is a direct reference to the atmospheric cooling witnessed in the subsequent years of the eruption of Mount Tambora. In one of the Greek myths, Prometheus was tortured by Zeus for stealing fire and giving it back to the humankind as they were suffering from the cooling on the Earth (Raggio 44-62). The Scottish poet Thomas Campbell’s “The Last Man” displays similar apocalyptic and dystopian anxiety with reference to the diminishing sunlight. The phrases ‘face is cold’ and ‘race is run’ are direct indications towards the year without the summer (1816) when the world witnessed freezing temperatures even during the hottest months of the year. The poet captures the fading sunlight witnessed all over the world post Tambora eruption.

Ee’n I am weary in yon skies.

To watch thy *fading fire*;

Test of all sumless agonies

Behold not me expire. (199-201) (Authors' Italics)

Campbell again talks about watching the fading fire of the sun as extraordinarily little sunlight passed through the atmosphere after the eruption of Mount Tambora.

In Lord Byron's *Childe Harold's Pilgrimage* Canto III, Byron says that the daytime passes as it used to even though the storms stop the sun from coming out - a climatic condition common during the year without a summer. "The *day drags* through though *storms keep out the sun*; And thus, the heart will break, yet brokenly live on." (Byron 225) (Authors' Italics). Climatoglossia, hence, helps in understanding the type of climate being discussed in a text and relates atmospheric science to literary studies. Lord Byron's "Darkness" (...bright sun was extinguished) and *The Prisoner of Chillon* (...imprison'd ray, ...livid light), P. B. Shelley's *Mont Blanc* (...glaciers creep) and Thomas Campbell's "The Last Man" (...proud Sun, thy face is cold, thy race is run) are also some other examples of Climatoglossia.

## **Conclusion**

Imagery is a poetic device. The cited imageries are results of neurochemical reactions reflect the sense of objects being described or referred to as objects. Imageries reflecting isolation, sleeplessness, isolation, escapism, climate, catastrophic climate, climate change and its impacts on humans are neurochemical impact, which could not be a part of systematic study of literature.



The research paper attains the outcomes of the need of approaching and analyzing climate imagery critically and independently. Climate imagery aids in understanding the reasons of atmospheric transformation and its impact on other natural phenomena and humans both. They help to get ideas about climate, climate change, its causes, its effects and how people respond to such alterations. It is observed how descriptions of natural calamities and catastrophes are present in Romantic poetry: the reflections of post Tambora eruption through climate imageries, for example. The paper also conceptualizes Climatoglossia as glossary of words and phrases referring to the descriptions of climate and climate change which also aid in extracting climate imagery in a literary work.

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