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## SCIENCE VIS-À-VIS LITERATURE AND LITERARY STUDIES: A CRITICAL STUDY

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### ABSTRACT

From the past several centuries, the enormous Science and Technological advancements have come a long way in understanding the world by unraveling its mysteries in making it a better place for all of us. The achievements of science are simply unprecedented especially in the past century. Literature as a distinct mode of human enquiry is perhaps as old as Science. And this is what links the two---If Science is a systematic domain of enquiry that builds and organizes knowledge in the form of verifiable explanations and hypothesis about the universe, Literature in its own intuitive way aims to reflect life and the general human condition since both empirical and intuitive ways of analysis are vital in understanding the enormous complexity of our life and universe. The general tendency is to think of science as one kind of human investigation and literature as another, and that the two do not have anything in common, yet in the rapidly growing discipline or genre of science fiction, we see the coming together of these two diverse disciplines, as it combines the human literary imagination with that of the scientific mind. In any case, the fountainhead of all of human enquiries is human mind and both literary imagination and scientific imagination emerge from it. Since Science has impacted our lives in all the shades, this paper will attempt to study its impact on literature, or to be more specific, literary studies. By this study, the aim is also to explore the various ways in which literary studies can further benefit from the enormous influence that Science exercises on our lives.

Keywords: Science, Arts, Literature, Life, Universe, Imagination, Technology, Poetry, Criticism.

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In his famous work, *Novum Organum Scientiarum* or (new instrument of science), 1620, the eminent 17<sup>th</sup> century British Essayist, philosopher and Scientist, Francis Bacon expressed the hope that empirical investigation will ultimately smash the old ideas and lead to greater understanding of the world and heavens. Really, in these last 400 years, Science and Scientific advancements have come a long way in understanding the world in making it a much

better/changed place for all of us. The achievements of science are simply unprecedented especially in the past century. In 19<sup>th</sup> century, the well known scientist Thomas Henry Huxley famously remarked: "It seems impossible that either nations or individuals will really advance, if their outfit draws nothing from the stores of physical science. An army without weapons of precision, and with no particular base of operations, might more hopefully enter upon a campaign on the Rhine, than a man,

devoid of knowledge of what physical science has done in the last century, upon a criticism of life " (qtd. in *Science and Literature*, 1880). And in 21<sup>st</sup> century now hardly anyone of us will disagree with Huxley's remarks.

Literature as a distinct mode of human enquiry is perhaps as old as Science. And this is what links the two---If Science is a systematic domain of enquiry that builds and organizes knowledge in the form of verifiable explanations and hypothesis about the universe, Literature in its own intuitive way aims to reflect life and the general human condition since both empirical and intuitive ways of analysis are vital in understanding the enormous complexity of our life and universe. The general tendency is to think of science as one kind of human investigation and literature as another, and that the two do not have anything in common, yet in the rapidly growing discipline or genre of science fiction and many other new emerging disciplines, we see the coming together of these two diverse disciplines, as it combines the human literary imagination with that of the scientific mind. In any case, the fountainhead of all of human enquiries is human mind and both literary imagination and scientific imagination emerge from it. If Science can said to be examining the nature of the real world and to derive logical conclusions by means of data, technology and evidence to gain an understanding of it, on the other hand, Literature, as a reflection of life and product of human imagination, aims to find truth which may not necessarily lie in the real world around us but rather in our minds and our feelings and intuitions. If Science makes us aware of the physical workings of ourselves and the universe around us, Literature aims to make us humane and sensitive to ourselves and the rest of the universe around us. Sensitivity can often pave way for a better understanding and clear paths for a more rational scientific enquiry as we all strive to make our world better. We have undoubtedly achieved great advances in Science and technology, but perhaps making Science a "bad master" has also put humanity at the perils of destruction, but instead of blaming science and technology, we as citizens of the world need to sensitize ourselves in how to make the use of science and technology for further betterment. In

this, literature has a role to play in making us aware about that sensitivity. What all this teaches us is that Science can be an inspiration for literature. Both science and literature share an intimate relationship with one another in how both have influenced and spurred each other. We can continue with this and aim to take the beneficial influences of Science and technology to the next level as we seek to improve the significance and relevance of literature and humanities for our times in which we see an aversion building towards science and scientific enquiries in view of a reassertion of the dogmatic and regressive political and social forces.

Technological gadgets for achieving the pedagogical goals is okay, but the foundational principles of scientific enquiry can also help us, who are in the arts and humanities, in a better understanding of looking at the world through the prism of intuitive and imaginative analysis. And there are just enough historical examples to back up this claim, whether we are talking of the Copernican revolution spurred by the intense Renaissance learning of Classical Greek and Roman sciences and literature. When Prussian Scientist, Nicolaus Copernicus(1473-1543) first and later Italian Scientist Galileo Galilei(1564-1642) questioned the classical view of "Geocentrism" and replaced it with "Heliocentrism", there was widespread awakening across the domains of human activity; the artists and writers now began to pose questions about existence in their own ways. It paved for Reformation in the Christianity besides other things. In England, Francis Bacon (1561-1626) was particularly influenced by this new scientific awakening which was shaking much of the Western world in the 16<sup>th</sup> century. In his writings, he advocated for a rational and scientific attitude towards learning and knowledge. There was a tilt toward more critical inquiry and humanist learning which went a long way in shaping the curriculum and new learning of the modern era which spurred the growth of science and scientific studies in the western world. Similarly, when Isaac Newton (1643-1727) popularized the ideas of his Mechanical Philosophy or what is popularly known as Deism(which saw universe as a great working machine which works on certain self-contained

laws), it significantly impacted the art and poetry of that time besides influencing a change in how people looked at the world. For instance, the famous 17<sup>th</sup> century metaphysical poet, John Donne (1572-1631), gives a poetic description to this in his poem "An Anatomy of the World" :

And now Philosophy calls all in doubt  
The elements of fire is quite put out  
The sun is lost, and the earth, and no man's wit  
Can well direct him where to look for it (1-4).

Poets, who followed John Donne like George Herbert, Andrew Marvell, Richard Crashaw, Abraham Cowley, etc. known as Metaphysicals, drew inspiration from the new Sciences and recrafted their poetry by exalting reason and intellect in their poetry by combining it with feelings and emotions. In fact, the late 17<sup>th</sup> century and early 18<sup>th</sup> century English poetry which falls under the Age of Reason is seen as an artistic reflection of the Mechanical Philosophy and the growing centrality of human reason. The famous English literary figures who were born in this era—John Dryden (1631-1700) and Alexander Pope (1688-1744) advocated for the use of reason, order and rules in a mechanical way in the poetry. Expressing the spirit of his age, Alexander Pope writes in one of his poems "An Essay on Criticism" in 1709:

Those Rules of old discovered, not devised,  
Are Nature still, but nature methodized (88-89)

John Dryden describes the new force of 'Reason' in one of his poems, "Dim as the borrowed beams of moon..." (1682) in the following lines:

To lonely, weary, wandering travelers  
Is reason to the soul;  
But he affirmed that Reason's glimmering ray  
Was Lent, not to assure our doubtful way  
But guide us upward to a better day." (2-6)

Drawing home the immense impact of Newton's scientific theories, Alexander Pope wrote in "Epitaph for Sir Isaac Newton" in 1727:

Nature and Nature's laws lay hid in Night

God said, let Newton be! And all was Light.  
(1-2)

Moreover, the scientific spirit of the Newtonian Age demanded that Christianity or religious life must become reasonable as was advocated by the famous philosopher John Locke. John Sheffield, also known as Lord Mulgrave (1648-1721) presents a poetic account of this in the following lines:

While in dark ignorance we lay afraid  
Of fancies, ghosts and every empty shade  
Great Hobbes appeared, and by plain  
reason's light  
Put such fantastic forms to shameful flight.  
(qtd. in Sutherland, 1948)

In a similar way in the 19<sup>th</sup> century, poets and artists responded to the new scientific revelations in the field of Geology (Especially, Charles Lyell's idea of Uniformitarianism—the idea that the Earth was shaped by the same scientific processes still in operation today) and Evolutionary Biology (Charles Darwin's famous theory of Origin of Species) in their own ways. Many critics have explored the huge influence of Lyell's geological studies on the poetry of Victorian Poets especially Alfred Tennyson and which led to the formulation of what is known as "Uniformitarian Poetics". In "In Memoriam. A.H.H. Canto 118", Tennyson writes:

They say,  
The solid earth whereon we tread  
In tracts of fluent heat began,  
And grew to seeming-random forms,  
The seeming prey of cyclic storms,  
Till at the last arose the man; (7-12)

According to literary historian Arthur Compton-Rickett, the poetry of Tennyson is "like the work of an inspired scientist" (90-91). The longing for rational truths under the new scientific influence was also pursued by the novelists in the Victorian era. The emphasis on scientific realism only increased afterwards. In this context, Compton-Rickett further observes: "In fiction the scientific

spirit is no less discernible: the problems of heredity and environment preoccupying the attention of the novelists. The social problems of the earlier Victorians, of Charlotte Bronte, Dickens, Kingsley and Reade give place to points in biology, psychology, pathology. The influence of Herbert Spencer and of Comte meets us in the pages of George Eliot; while the analytical methods are even more subtly followed in the fiction of George Eliot, the early writings of Mrs. Humphrey Ward, and the intimate Wessex studies of Mr. Thomas Hardy" (ibid.)

It is also an established fact that Charles Darwin's Theory of Evolution caused ripples in the Western society in the mid 19<sup>th</sup> century in the form of increased doubt and skepticism towards religious and spiritual values. In England, it caused what is popularly known as the Victorian Dilemma in which the intellectuals found themselves torn between skepticism towards faith and reluctance towards free thinking. This dilemma can be found in all the major Victorian poets like Arthur Clough, James Thomson, Matthew Arnold, and Edward Fitzgerald as all of these poets in their poetry testified to the skeptical tendencies evoked by scientific research. Some, like Robert Browning, tried to downplay this polarization in their own ways as he famously said in his poem "Pippa's Song":

God's in His heaven—

All is right with the world. (7-8)

With the dawn of the 20th century, we have indeed witnessed unprecedented advancements in science and technology that have adversely affected the traditional knowledge systems of enquiry like literature, art, and philosophy which we broadly categorize as Liberal Arts or Humanities. Notwithstanding the seemingly stark division between scientific and literary domains, literary writers and critics have drawn considerable influences from Science and Technological advancements in shaping the new contours of literature and literary studies. Since fresh and path-breaking scientific advancements and theories of the 20th century, including Albert Einstein's Theory of Relativity, Werner Heisenberg's Uncertainty Principle, Kurt Gödel's Incompleteness Theorem,

and the complexities of quantum physics, have contributed to the general decline of the previously accepted belief in the mechanistic, rational, and supremely-ordered Newtonian universe and have to a significant extent, influenced the common themes of discontinuity and unpredictability that characterizes much of the postmodern literature. And as a critic has remarked, the literary corollaries of modern scientific theories like the Chaos Theory, which establishes the complex order of disorderly systems while positing their long-term unpredictability, and Cybernetics, which views both humans and machines as complex systems of information—can be found in the writings of such figures as Donna Haraway, Italo Calvino, Don DeLillo, Stanislaw Lem, Roland Barthes, Jean Baudrillard, Jacques Derrida, and many others.

The impact of a rapidly advancing world of science and technology has also given rise to the emergence of fresh interdisciplinary disciplines or genres like Science Fiction/ Sci-Fi, Techno-Criticism, Eco-Criticism, Eco-Feminism, etc.

Science Fiction or Sci-Fi:- It was William Wilson who first used the term Science Fiction in 1851 in his book *A Little Ernest Book Upon a Great Old Subject* and Forest Ackerman who used the term Sci-Fi /sai fi/ in 1954). First exhibited in the imaginative writings of Edgar Allan Poe in America, Mary Shelley, Jules Verne, and H. G. Wells, science fiction focuses on the place of science in contemporary and future life and is concerned with the possible impacts of rapidly-accelerating technological discoveries on society and on human perceptions of reality. As such, science fiction continues to provide a viable medium of speculation and communication in a technological world. As a subgenre of fiction, it deals imaginatively with probable and improbable concepts like futuristic science and technology, space travel, time travel, parallel universes, and extraterrestrial life. Science fiction traverses the path between human speculation and scientific innovation. Prominent Sci-Fi writers include Aldous Huxley(1894-1963), Forest Ackerman (1916–2008), Douglas Adams(1952–2001), Robert Adams (1932–1990), Jules Verne, H G Wells, etc.

Techno-Criticism:- is a sub-discipline of critical theory which studies the technological transformations from the perspective of individuals and society. Technocriticism treats technological advancements not merely as linear, useful developments, but as historically specific changes in personal and social practices of research, invention, regulation, distribution, social use and discourse. These personal and social practices are studied in their changing practical and cultural significance. It documents and analyzes both their private and public uses, and often devotes special attention to the relations among these different uses and dimensions. Recurring themes in technocritical discourse include the deconstruction of the essentialist concepts such as "health", "human", "nature", or "norm." Scholars include Judy Molloy, Mathew Kirschenbaum, Katherine Hayles, Michael Joyce, etc.

Eco-Criticism:- Ecocriticism, coined by William Rueckert in his 1978 essay entitled *Literature and Ecology: An Experiment in Ecocriticism*, is the study of literature and the environment from an interdisciplinary point of view, where literature scholars analyze texts that illustrate environmental concerns and examine the various ways literature treats the subject of nature. Other ecocritics/writers include Rachel Carson, Greg Garrard, Michael Cohen).

Eco-Feminism:- Ecofeminism, first coined by French feminist Françoise d'Eaubonne in 1974, is a term that links feminist struggles with the ecological struggles. Its advocates say that paternalistic/capitalistic society has led to a harmful split between nature and culture. Early ecofeminists propagated that the split can only be healed by the feminine instinct for nurture and holistic knowledge of nature's processes. Modern ecofeminism, or feminist eco-criticism, eschews such essentialism and instead focuses more on intersectional questions, such as how the nature-culture split enables the oppression of female and nonhuman bodies. It is also an activist and academic movement that sees critical connections between the exploitation of nature and the domination over women both caused by men. Ecofeminists include Atwood, Greta Gaard, Carolyn Merchant, Mary Mellor, Vandana Shiva, etc.

What is needed is an inculcation of more interdisciplinary approaches which traverse the boundaries between Science and Humanities on the lines mentioned above. This will open up many new ways of critical enquiry and reflection. Our curriculum needs such fresh interventions in order to bring it in tune with the rapid advancements of Science and as well as to make it more appealing and interesting for the students/learners. This also might open up new avenues of possible employment besides inculcating rational sensitivity among our future generations. As we have seen, throughout the various historical eras, literature and literary studies have responded to the advancements of science and technology and in the ultimate analysis, it is the larger humanity that has benefitted out of it. The contemporary era demands a much greater synergy and blurring of boundaries between Science and Humanities to look for fresh fields of knowledge seeking. In return, Science and Scientists would also lose nothing from their interactions with arts and humanities because arts and humanities will always prepare them to fulfill their responsibilities as citizens of the world by making them more humane, sensitive, creative, interactive, truthful, and above all, will make them aware about the true needs of human society which are ever changing.

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