

Exploring the Interface between Scientific Diction and Literacy Through an Analysis of Ladé Wosornu's "Chemistry" and "The Street"

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ABSTRACT This paper analyzes two poems by the Ghanaian surgeon turned poet – Ladé Wosornu – in order to demonstrate how the poet's use of scientific diction to achieve a literary purpose can enhance the literacy horizon of the reader. In both "Chemistry" and "The Street", the poet deploys images and concepts from chemistry, physics, biology, and general technology to facilitate his poetic intentions. An effective appreciation of the poems requires some amount of dictionary work, imaginative flights, and critical thinking, which could impact the literacy horizon of the reader.

INTRODUCTION

One of the intellectual domains in which language is used to respond to the beautiful complexity of life experiences is poetry. The language of poetry carries much more weight than individual phrases usually do in prose; the poet has to concentrate meaning and emotions in a selection of language that often aims to communicate deep feelings and profound ideas within the space of a few words (Leech 2014). The reader of poetry is thus inevitably involved in a process that requires the exercise of unraveling the meaning behind the selective packaging of words and phrases in the poems. When this linguistic selectivity is blended with scientific diction in order to converge scientific meaning with poetic intentions, the process of appreciation tends to involve a level of complexity requiring the reader's exercise of scientific knowledge and literary interpretative skills. This exercise has enormous implications for the reader in terms of development of literacy – that is, the individual's power of self-expression and critical thought. Hodges (2014), for example, recognizes the potentialities of the use of poetry to enhance literacy skills, while Ramirez and Jimenez-Silva (2014) emphasize the role of poetry as a means of communication and a literacy enhancement tool for English language learners. A review of the literature on the use of literary texts in the language classroom depicts an increasing endorsement of this

approach (Bobkina and Dominguez 2014; Vardell and Wong 2015). In this paper, therefore, the researchers analyze two poems by a Ghanaian surgeon – Ladé Wosornu – who has gained recognition on the West African literary scene, some of his poems having been prescribed by the West African Examinations Council to be studied for the senior secondary school examination, in order to demonstrate how the poet's use of scientific diction to achieve a literary purpose can enhance the literacy horizon of the reader, especially in the language classroom.

Objectives

One of the objectives of this paper is to demonstrate how scientific terms as used in poetry can provide contexts for readers not only to explore the meanings of such terms but also to appreciate how they contribute to unraveling poetic intentions. Another objective, albeit related to the first, is to illustrate how the process of reading with the accompanying dictionary work should promote literacy.

The next section provides a broad overview of the association between science and poetry, which is followed by an explanation of the conceptual framework for the study. Subsequent sections outline the biography of Ladé Wosornu, and analyze and discuss the two poems – "Chemistry" and "The Street". The last section concludes the paper.

Science and Poetry

From the earliest of times, science (used here to cover natural physical and applied sciences) and poetry have lived in seemingly symbiotic relationship. Poets have drawn on science or scientific phenomena as their legitimate subject area. In many cases, the poets themselves have also been keen or practising scientists who have drawn on their professional experiences or borrowed largely from terminologies akin to their subject areas to convey their intentions. There are also contemporary scientists who have drawn on the phenomenon of poetry to explain psychological disorders in patients (Saunders 2014).

As early as Biblical times poets such as David and Job described thoroughly such astronomical subjects as the “heavens, firmament” (Genesis 1:6; Psalm 19:1) and “Arcturas, Orion, Pleiades” (Job 9:9; Job 38:31)¹. This trend continued right through the Middle Ages where a spirit of enquiry dominated all actions in Europe and where poetry itself was looked upon as a science (Cartwright 2007; Mandall 2011; Iyengar 2014; Riva et al. 2015).

William Shakespeare, the greatest poet in English of all time, naturally borrowed a large portion of his diction from science or scientific phenomena. Shakespeare’s case was particularly so because in his day sciences such as medicine and astronomy were becoming more and more useful and the general Elizabethan view was that the science of astronomy could be appealed to in matters to do with people’s everyday lives (MacLane 2000). In his poems, *Venus* and *Adonis*, he uses such medical vocabulary as “burning fevers, ague, pale, faint, life-poisoning pestilence, infirmities, maladies” and many more of such scientific phraseology (See Stanza 24-26)². This usage is a common feature of Shakespeare’s work and indeed characterizes his plays as well. For instance, in *Macbeth*, there is common resort to medical diction as exemplified by the following: “disease, practice, infected minds, physician” (see Act 5, Scene 1). The practice has continued over the years. John Keats who at a point trained as a surgeon, commonly used such terms as “ague, pallid, grew faint, feeble, dizzy, drowsy, Morphean amulet” (in “The Eve of St. Agnes”) “swoon” (in “Would I were as steadfast as thou art”)³.

In modern times, the dominance of science and technology has found its counterpart in poetic diction too. T.S. Eliot uses such words as “levitation” in his poetry often (see “Macavity, the Mystery Cat”, Eliot 1969). The American poet, Ferlinghetti’s (1958) “In Goya’s Greatest Scenes We Seem to See” uses words such as “cement skies, tumbrels, concrete continent, bland bill boards, strung-out citizens, painted cars, engines” and many others.

The Gambian poet, Lenrie Peters, himself a surgeon also shows a clear leaning towards scientific diction. For instance, in his poem “The Fire Has Gone Out”, he uses such expressions as “aching gout”, “typhoon”, and “arteries stiffen” (see Nwoga 1967). The Malawian poet, Felix Mnthali (1982) also has a poem entitled “Symbiosis in Chejusu” among others. Other African scientists who have written poetry are Agostinho Neto and Ngudia Wendel of Angola, Birago Diop – a veterinary surgeon from Senegal, Zimbabwe’s Kristina Rungano, a computer scientist, and the medical doctor R.E.G. Armatloe of Ghana.

Conceptual Framework

The conceptual underpinning for this paper derives from Cartwright’s (2007) conceptual framework for incorporating literature and science studies into teaching/pedagogy, which proposes that interactions between science and literature can be categorized into eight; namely, “(1) Science as a source of images, metaphors or explanatory devices; (2) Science derided, rejected and satirized – the foolish virtuosi; (3) Science as provoking cognitive dissonance requiring intellectual accommodation and negotiation; (4) Science celebrated – the scientist as hero, or science applauded as evidence of Divine power; (5) Didactic verse – poems of science; (6) The Romantic dismissal: science as cold and inhuman; (7) Scientific irresponsibility: Faust and Frankenstein figures; (8) Literature or science claiming ontological primacy.” (p. 117). Of relevance to this paper is the first category – Science as a source of images, metaphors or explanatory devices. In this category, the author uses science along with other cultural material to achieve some literary purpose. To illustrate, Cartwright cites the case of Chaucer who uses astrology to explain the behavior of his characters. He also refers to the preponderant deploy-

ment of astronomy (across the ages) to craft metaphorical relationships; Thomas Hardy's use of "evolutionary motifs" (p.118) from the discipline of biology to reconnect humanity to nature; and generally, creative writers use of motifs from physics and information science. From the perspective of this conceptual framework, Wosornu's use of science locates itself within the first category, and his diction spans botany, chemistry, information technology, physics and geology.

Arguably, creative writers' use of scientific images or explanatory devices to facilitate their intentions has implications for the reading process. In the process of reading, the reader would have to consider the literal meanings of these scientific terms; then relate these meanings to the literary contexts in order to arrive at the literary purpose or intentions of the poet. The poet's use of scientific diction could, therefore, thrust the reader into a more participative or interactive reading process involving unraveling the link between literal scientific meanings and poetic intentions. This process, the researchers contend, should enhance literacy which in this paper is defined briefly as the individual's capacity for self-expression and critical thought.

The Poet, Ladé Wosornu

Ladé Wosornu was born at Galo-sota, a village in the Volta Region, Ghana in 1939. His father was a herbalist who practised holistic medicine, including obstetrics. His mother was a trader; however, she was also a gifted "Akpalu"⁴ performer with a tremendous capacity for recall. As a professor of surgery on one side and a poet on the other, Wosornu appears to have been "gifted" in equal measure by both parents. He has three collections of poems: *Eté – A Woman of Africa and Other Poems* (1995); *Journey Without End and Other Poems* (1997) and *Celestial Bride and Other Poems* (2002). Ladé Wosornu is very conscious of his background as a scientist in the exercise of his poetic inclinations. At the Harare International *Book Fair* in Zimbabwe (*Indaba* 2001), he proclaimed:

Except that the house of my surrogate mother is full of test tubes, mathematical sets and microscopes. She compels accurate observation and methodical measurement. In that surrogate house, the pen is a late acquisition. This is why the ingredients which spice my poems

include numbers, chemistry, physics and medical terms.

He also said:

By insisting upon precision and dissection, the surgeon in me wars with the poet in me. He compels the poet to walk another proverbial knife's edge. It is that line between being precise and being pedantic. It is your province. Not mine, to judge whether I remain safe on the edge of discernment.

Deeply aware of the tensions inherent in his literary craft, Ladé Wosornu leaves its assessment to the community of readers and critics. The analysis and discussion in subsequent sections of this paper is not so much an attempt to assess how successful Ladé Wosornu's literary craft is but rather an exemplification of how he has been able to interlock scientific meaning with poetic intentions, and thereby engage our intellect in intensely creative ways.

ANALYSIS AND DISCUSSION

The analysis and discussion focus on two of Wosornu's poems: "Chemistry" and "The Street". "Chemistry" is a love poem; and the poet is praising the spiritual qualities of the loved one. In order to convey this message, the poet uses seemingly outlandish scientific jargon like "chemistry", "organic chemistry", "hydrogen bond", "convex lens", and "vanishing point".

Chemistry

- Though in the flesh we are apart
 In spirit you bind us together.
 Like a tantalizing hydrogen bond
 A puzzle of organic chemistry,
 5 Tie that binds: Mocker
 Of limited physical sense,
 Invisible convex lens:
 You focus my mind
 To vanishing point.
 10 And there you stand lit
 As if by flames in wells of oil.
 The deeper the frost of silence
 The blacker the veil of night,
 The starker your beauty is revealed.
 15 Self-luminous thing, uncoverable light:
 My love, you yourself are the tie that binds.
 How then can you hope to be concealed
 Behind barriers fashioned by human minds?

The very title of the poem "Chemistry" evokes both the scientific process of substance combination or interactions and the figurative meaning of synthesis of emotions or qualities. In regular dictionary definitions, "Chemistry" as a scientific area of study is defined as the science that deals with the characteristics of simple substances and the changes that take place when they combine to form other substances, and the laws of their behaviour under various conditions; whereas in ordinary usage, "chemistry" means the complex emotional or psychological interaction, typically when experienced as a powerful mutual attraction (For example, "Their affair was triggered by intense sexual chemistry"), or simply, "harmony" or "compatible bonding". Used as the title of the poem, the word "chemistry" would, conceivably, suggest scientific associations to the reader and shape the reader's interpretation of the poem. In other words, in the figurative world of literary interpretation, the scientific connections or associations evoked by the word "chemistry" become a necessary part of unraveling the meaning of the poem. This is further accentuated in line 4, with the poet's reference to "organic chemistry" (the branch of chemistry that deals with compounds of carbon). The probing reader may embark upon dictionary work at this stage. The dictionary search would yield further clarifications for the qualifier "organic", which has two meanings: (a) reference to something relating to, or derived from living matter; and (b) relating to, or denoting compounds containing carbons. Furnished with these meanings, the reader may consider "organic" as making reference to "living matter"; therefore, the collocation "organic chemistry" may be understood as referring to the bonding between two living beings. The choice of scientific diction then motivates the convergence between scientific meaning and poetic intention, which in turn kindles associations that make the poetic experience unique and intellectually stimulating. The reader is immersed in an interpretative process that involves exploring the conceptual and experiential relationship between the scientific diction and the poetic intentions; a process which, it is being suggested, would take the reader on the enlightening paths of literacy.

"Like a tantalizing hydrogen bond" (line 3): With this simile, the poet captures the strength of the relationship between the persona and the object of his love. The source of the simile is the

scientific concept "hydrogen bond" which is generally defined as a chemical bond in which the hydrogen atom of one molecule is attracted to the electronegative atom of another molecule, as in compounds containing nitrogen, oxygen, or fluorine. The *New Scientist* (as quoted in *The World Book Dictionary* 1996) offers the following illuminating explanation of the concept – "Hydrogen bonds hold life's molecules in shape, and play a vital role in enzyme catalysis, the action of drugs and anesthetics, and taste." A standard dictionary definition of hydrogen bond is as follows: "a weak bond between two molecules resulting from electrostatic attraction between a proton in one molecule and an electronegative atom in the other". The word "weak" in "a weak bond" underlines the fragile link between the couple, and by extension the non-physical nature of the "togetherness" as captured in lines 1 and 2 – "Though in the flesh we are apart/In spirit you bind us together".

Another example of scientific diction in verse one is "convex lens" which is a familiar term from Physics. First, let us consider the meaning of "lens" since it is the qualified item. A dictionary definition of "lens" is "a curved piece of glass or plastic that makes things look larger, smaller or clearer when you look through it." The word "convex" is defined as "having an outline or surface curved like the exterior of a circle or sphere". The dictionary then suggests comparing "convex" with "concave". It defines "concave" as "having an outline or surface that curves inwards like the interior of a circle or sphere". A key difference between the two is that while a concave lens is thinner at the centre, a convex lens is thicker at the centre. The contrast between "convex" and "concave" lies with the words, "curve outwards" for convex and "curve inwards" for concave. Of relevance in this context is the phrase "vanishing point" (line 9) which is explained as the point at which receding parallel lines viewed in perspective appear to converge; and (b) the point at which something that has been growing smaller or increasingly faint disappears altogether.

Convex captures the sense of an outward projection which makes the image of "vanishing point" more powerful. The poet in essence draws from the image of light, along with the phenomenon of refraction to transport the reader into the metaphysical world of his object of love. The object of love is "self-luminous"; that is, it

possesses in itself the property of emitting light, with an implied comparison to celestial bodies like the sun and stars. It is a relationship captured in scientific terms but at the same time deeply metaphysical. Through scientific diction, therefore, we come to terms with the abstractness of the poet's experience. But the journey to that point is a learning one – we have to interrogate aspects of Chemistry and Physics through dictionary work. This interface between poetry and science finds validation in the research by Vardell and Wong (2015) who point out that "...poetry's brevity, conceptual focus, and carefully chosen vocabulary make it a natural teaching tool for connecting with science, whether to jump-start or introduce a topic, present examples of terminology or concepts, provide closure that is concept-rich, or extend a science topic further" (p.16-17).

The Street

- Built to please the eye and sub-serve
the foot
Our streets are no longer beauty's domain.
With dust untamed by asphalt, grass or tar
Without pavement, foot-path, embankment
5 Portholes [sic] filled and re-filled with
loose red earth.
Our streets were open and foetid trash
cans.
Man traps, roads unworthy of vehicles.
Shops spill their plastic contents
Like dismembered pregnant uteri
10 Blood, foetal parts, liquor and all
The street is an extension of homes,
It is market, battlefield, play-pen, loo.
It is the living, dining and guest room.
The street is unforgiving, and, for some
15 It is bridal suite and the final berth.

"The Street" is a descriptive piece which dwells on human activity on a particular landscape. It is an irony aimed at initiating social comment, possibly an attack on the people of his time. The poem is ironical but there is also a note of pathos because of the imagery of dismemberment and devastation, which is captured vividly by the scientific terms: asphalt, tar, uteri, foetal.

Each of these words is examined closely: "asphalt" is defined as "a mixture of dark bituminous pitch with sand or gravel, used for surfacing roads" etc., and "tar" refers to "a dark, thick flammable liquid distilled from wood or coal, consisting of a mixture of hydrocarbons, resins, alcohol, and other compounds. It is used in road making and for coating and preserving timber". The definitions might be somewhat technical even though to a large extent the words in question have crept into ordinary usage, and people generally know the difference between an asphalted or tarred road and the opposite. These scientific words enable the reader to visualize not only the society's incapacity to sustain technological advances but also its tragic acquiescence to the blight of urbanization.

In the second stanza the dismemberment and devastation of society is reflected in the analogy of the "uteri", the uteri or the womb as a bodily organ. It is used in medical and technical contexts. "Foetal" is the adjectival form of "foetus" which refers to "the unborn or un-hatched offspring of a mammal, in particular, an unborn human more than eight weeks after conception". The link with abortion "dismembered pregnant uteri" suggests a lifeless society. Therefore, through a simile the poem links the disorderliness and chaos with a medical phenomenon. We also encounter the word "plastic" (line 8) which is defined in most dictionaries as "an artificial substance mainly derived from petrochemicals and when soft can be shaped into different forms and used for a wide range of things". It is also noted for its non-biodegradable nature making it a serious environmental threat. The overflowing plastic goods from the shop are compared with "dismembered pregnant uteri", which indeed is the consequence of a surgical procedure and evokes a ghastly imagery of blood and mutilated human parts. The apparent incongruity of the comparison rather brings into sharp focus the visual dimension of the repulsive world being portrayed. Additionally, it raises ethical and moral concerns: dealing in plastic products is as abominable as the violence unleashed upon the foetus. The world Wosornu describes is not only disorderly but also morally and ethically depraved and repugnant; and he conveys this sense through the exploitation of scientific diction.

In sum, the scientific terms combined with the outlandish collocations transport the reader

unto paths of lexical inquiry with the added element of critical thinking. Arguably, the scientific terms help the reader to conceptualize and visualize the poetic experience. The process of engaging these words and collocations; the process of interrogating the relationship between the scientific reference and the surrounding information is an exercise that should be intellectually challenging, with the added value that the reader becomes more enlightened.

CONCLUSION

It has been demonstrated from the foregoing that the use of scientific diction in poetry leading to a convergence of scientific meaning and poetic intention compels the reader to respond to an array of associations – the practical, the scientific, the aesthetic, and the philosophical. In crafting his poetic intentions or meaning, Ladé Wosornu makes scientific diction an integral part of his structuring of content. His diction straddles common scientific words to very specialized terms. An effective appreciation of the poems requires some amount of dictionary work, imaginative flights, and critical thinking, which could impact the literacy horizon of the reader.

RECOMMENDATIONS

In the process of reading poetry, the reader would have to consider the literal meanings of words; then relate these meanings to the literary contexts in order to arrive at the literary purpose or intentions of the poet. Furthermore, a good dictionary should always be at hand as it would help clarify the exact meaning of words as used by the poet. This will greatly enhance the absolute comprehension of the poet's diction.

NOTES

- 1 All references to the Bible are from *The Authorized King James Version* (2001).
- 2 All references to Shakespeare's works are from *The Complete Works of William Shakespeare*. (2006). New Lanark, Scotland: Geddes & Grosset.
- 3 Extracts from Keats from Anstey (1995)
- 4 The poems and songs of the celebrated late 20th century Ewe poet Vinoko Akpalu.

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