

# Dialogue between Science and Art

**Ma Ming Yan**  
**English, CW Chu College**

## 1. Introduction

On the presumable dichotomy between science and art, Albert Einstein famously said: “After a certain high level of technical skill is achieved, science and art tend to coalesce in esthetics, plasticity, and form. The greatest scientists are always artists as well.” Salvador Edward Luria echoes this sentiment in “The Way of the Imagination”, stating the common grounds between the two fields. He exposes the fallacy of the common assumption that just because science relies heavily on logic and experimental verification, imagination does not play a part in the practice of science. To advance his view, he introduces three main arguments. First of all, he argues that the work of the scientist is “a succession of imaginative efforts” (Luria 158). Then he argues that scientific hypotheses possess “aesthetic qualities” (159). Finally, he puts forward the idea that like artists, scientists display “uniqueness” (161) in their style of work. In the first half of the paper, the views of different scientists based on some of Luria’s arguments will be explored. Then I will offer my own viewpoints as well as discuss the importance of imagination in Romantic and Modernist poetry.

## 2. The Role of Imagination in Scientific Discovery

### 2.1 Imagination in the Scientific Method

Luria argues that the process of analyzing scientific data is “a succession of imaginative efforts” (158). In *The Beginning of Western Science*, Lindberg promotes a similar view in his discussion of imaginative elements found in the development of kinematics. Lindberg gives the example of the Merton scholars from the fourteenth century and points out the “philosophical underpinnings” (Lindberg 37) of their kinematic achievement. The emergence of velocity as a new measure of motion exemplifies the imaginative efforts of the scholars. Lindberg observes that velocity is “quite an abstract concept” that was not immediately available to the observation of moving bodies, and had to be “invented by natural philosophers and imposed on the phenomena” (37). For example, it was impossible for the medieval scholars to realistically identify an instance of uniformly accelerated motion. Hence, while developing the conceptual framework containing such abstract ideas as “velocity” and “instantaneous velocity”, the scholars had to rely on their imagination in forming “a coherent picture” (Luria 158). Lindberg establishes medieval kinematics as “a totally abstract endeavor” reliant on the human imagination, which begot a variety of theorems hugely influential in the development of kinematics (43). Therefore, Lindberg echoes Luria’s view that the scientific process of generating ideas and theorems requires imaginative efforts.

### 2.2 Science as a Pursuit of Beauty

Luria argues that scientists construct hypotheses not only for interpreting data, but also for satisfying their “aesthetic sense” (Luria 159). Correspondingly, Poincaré in *Science and Method* argues that science is

fundamentally an aesthetic pursuit. First, Poincaré argues that a “special intuition” or “sensibility” that enables one to “guess hidden harmonies and relations” directs one to make useful discoveries in the fields of mathematics and physics (169–176). Poincaré argues that mathematicians possess in mind “the feeling of mathematical beauty” which takes into account “the harmony of numbers and forms and of geometric elegance” (175). He suggests that mathematical demonstrations serve to satisfy the “aesthetic requirements” of the mathematician (175). Second, Poincaré argues that a scientist takes pleasure in studying nature “because it is beautiful” (165). He suggests that scientific inquisition is motivated by the scientist’s desire for an “intimate beauty which comes from the harmonious order of [nature]” (165). Poincaré supports his claim that science is fundamentally an aesthetic pursuit by identifying the tendency of science towards “economy of thought” and “of effort” (166). According to him, mathematicians and scientists naturally occupy themselves with “simple facts” that are beautiful because of their innate aesthetic sense (163–166). Therefore, both Luria and Poincaré believe that scientists seek to discern “a quality of simplicity or sweep” (Luria 159) in their data because the very aim of science is to satisfy the “aesthetic sense of the scientist” (159). On the contrary, Rosalind Franklin appeared to disagree with the idea that simplicity or beauty should be speculated on during scientific analysis. According to Watson in *DNA: The Secret of Life*, Franklin “had insisted that no model-building could commence before she collected much more extensive diffraction data” (Watson 127). From the description, Franklin appeared to be a firm believer of accurate, substantial data as the only sound basis for scientific hypotheses. She believed that testing out hypotheses largely based on intuition would result in a waste of time and unnecessary “distraction[s]” (Watson 129). Contrary to Luria and Poincaré’s

notion of science as driven by the aesthetic sense, Franklin held that science should be founded on concrete and objective data.

### 2.3 Imagination and Experimental Verification

Having established the significant role of imagination in scientific work, Luria remarks that scientific imagination is “restrained by experimental verification”, which he deems “a more exacting” form of validation than that available to works of art (162). Newton and Poincaré both asserted the necessity of combining imagination with experimental verification. Poincaré’s theory of the “subliminal ego” stipulates that fruitful unconscious work be “first preceded and then followed by a period of conscious work” (173–174). He states that it is necessary to verify the results of the sudden illumination however absolute is the feeling of certainty that accompanies the inspiration (173). Poincaré assigns equal significance to unconscious work and conscious work as manifested in “[t]he subliminal ego is in no way inferior to the conscious ego” (174). Since the subliminal ego responsible for unconscious work is “divined by a delicate intuition” (175) which is subjective, one can infer that Poincaré considers subjective imagination as equally important as objective experimental verification in scientific endeavors. Sharing a similar view, Newton however attaches greater importance to the objective component of the scientific process. He pointedly “declined to credit authors who tossed off general statements without being able to prove them mathematically or fit them into a valid framework of dynamics” (Cohen 51). Newton believes that “a complete physics with mathematical methods” must be applied to prove claims emanated from intuition for the claims to be legitimate rather than “general” (51). It is apparent that Newton regards experimental verification as more conclusive than the imagination in scientific work. Differing in

the degree of importance each attached to the subjective and the objective, both Poincaré and Newton nevertheless deemed it necessary to combine the imagination with objective verification in scientific enquiries.

### 3. My Viewpoints

I believe that human imagination and creativity can be manifested in different forms. Luria has aptly pointed out that imagination is not exclusive to the artistic approach to reality. I would like to argue that similarly, objectivity and precision are not exclusive to the scientific approach. Luria states that art “makes it possible to communicate emotions without claim to truth or objectivity” (162). The statement is true in many instances, but that is not to say that art has no claim to objectivity at all. In fact, the questions of impersonality and objectivity are crucial to Modernist poetry. The modernist literary movement is characterized by a pointed effort to overturn traditional emphasis on subjectivity in literature. Modernist writers such as James Joyce believed in the impersonality of the artist. In his famous work *Dubliners*, Joyce takes pains to provide an accurate, realistic description of the city and its inhabitants. The narrator in the stories also tends towards objectivity. He never interrupts the narrative of events by giving explicit comments, and rarely does he imply personal opinions through diction or other literary devices. The general objectiveness of the narratives renders the collection of short stories almost scientific. Apart from objectivity, precision in form and structure is also highly valued in literature, especially in poetry. Fixed verse poetry for example, demands strict adherence to the established guidelines concerning meter, rhyme scheme and such. Considering the prominence of objectivity and precision in literature, it is clear that both art and science appeal to a diverse range of experiences, objective and subjective.

## **4. The Importance of Imagination in Literature**

### **4.1 The Importance of Imagination in Creating Beauty**

Having discussed at length the role of objectivity and precision in literature, we shall go on to discuss the importance of imagination in literature in terms of two prominent literary figures: John Keats and T.S. Eliot. Keats and Eliot, representing two very different poetic traditions, both used imagination as a major theme in their works. Keats believed human imagination to be synonymous with creation. Keats's poetry stems from imagination in the sense that the world of his poetry is predominantly artificial. In his poem "Ode On A Grecian Urn", by describing in detail the images on a marble urn crafted in ancient Greece, Keats sets up a contrast between the world of imagination and the real world. Keats demonstrates the power of imagination in allowing one to transcend the restrictions of physical station, space and time. Using the ancient Grecian urn as a symbol of enduring art, Keats asserts the crucial role of imagination in the creative process and in the apprehension of beauty.

### **4.2 The Importance of Imagination in Understanding Meaning**

Like Keats, Eliot was also concerned with the powers of imagination in the interpretation of the human experience as shown in his use of symbolism, a literary device that employs certain objects as vehicles for communicating meaning through imagination. In "The Waste Land", Eliot makes use of a number of symbolic images such as the wasteland and water to express central themes of death and rebirth. The pervasiveness of symbolism in Eliot's works implies the poet's preoccupation with the role of imagination in creating mental connections between every day objects and meaning. Both

Keats and Eliot feature human imagination in their poetry to demonstrate the role of imagination as a powerful means to apprehend beauty and meaning, the contemplation of which create the fundamentals of literature.

## 5. Conclusion

The debate concerning the presumable polar opposites of science and art has been very much misguided. Even Luria, who argued for similarities between the two fields seem to have committed the common mistake of ascribing rationality only to science but not to art. Subjective imagination certainly exerts considerable influence over the creative process of writers and poets. In the same vein, objectivity has a prominent role to play in literature. Therefore, I maintain that far from being distinct domains that share occasional, incidental similarities, art and science share fundamental correspondences because both appeal to a diverse range of experiences, objective and subjective. Art and science, like warmth and coldness, in their sharp distinction justify not differences essential in nature, but differences in degree.

## Works Cited

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## Teacher’s comment:

There is a common impression that science is rigorous and objective, while art is emotional and tends to be subjective. Some people even ascribe rationality only to science but not to art. Such a position can be found in



Salvador Luria's *A Slot Machine, A Broken Test Tube: An Autobiography*, in which Luria compares artistic creation and scientific discovery in the chapter "The Way of the Imagination". Ming Yan responds to Luria's position in the essay. She agrees with him that imagination is not exclusive to the artistic approach to reality, but she also points out that neither objectivity nor precision are exclusive to the scientific approach. In other words, Luria made a mistake.

Reading the essay was a joyful experience. Ming Yan's deep reflection on the UGFN core-texts and her expertise (English literature) is inspiring. The reader will appreciate her effort in making connections between science and art. She uses a lot of examples to illustrate the importance of imagination in literature. It is therefore of no surprise that the essay is very convincing.  
(Wong Wing Hung)