

Original Paper

Science and Literature: Distances and Approaches

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Abstract

The Academy and other formal institutions that deal with knowledge tend to treat Science and Literature as distinct areas, each with very particular ways and methods of building knowledge. However, in certain aspects—perhaps the most important—both carry and disseminate their messages through the same symbolism and vehicle of communication, that is, the word. Both Science and Literature are useful, beautiful and edifying mechanisms, which can be used by the same person, in the same context or creative process, thanks to the proliferation of communication technologies, especially books, magazines, articles, computers and smartphones. In other words: these two segments are continuous or complementary, since all Sciences and technologies refer to reality, and this, in a broad sense, is an indivisible unit. This means that arbitrary divisions of knowledge help in the effort to organize studies, research and their products, but the established division is always compulsory and alienating, hence the urgent need for true interdisciplinary, considering that knowledge is one, with a universalizing character. This article aims to analyze the intricacies of these two areas of knowledge, drawing parallels between their construction processes and verifying the reasons for their distances and approaches over time.

Keywords

epistemology, interdisciplinarity, scientific method

Introduction

Like every area of human knowledge, both Science and Literature are defined according to their objects of study. Thus, in general terms, Science is conceived as the human effort to understand reality systematically and through evidence. Literature is understood as the art of using words aesthetically, enabling them to convey ideas and emotions in a beautiful and captivating manner. Furthermore, both Science and Literature are built on two major foundations or aspects: the body of works they create and

the method or process they employ in their construction. In the first case, knowledge systematization prevails, and in the second, the type of method utilized.

Some scholars argue that Science and Literature are two fields characterized by distinct approaches and methods, and therefore, they should continue to maintain their own principles and paths. Others advocate that both literature and science work with words, especially writing, and as such, they are naturally similar and serve the same purpose. Hence, it is important to conduct a careful analysis of the methodology they employ, or rather, that is employed within them, in order to gain a clearer understanding of what sets apart and what unites these two important branches of human knowledge.

The method is a rational, coherent and planned procedure for conducting research, aiming to reach a theoretical-practical product or result that resolves or clarifies an initially posed question. As the name suggests, it is a path designed to better approach and understand the issues raised and the reality observed.

The method has a liberal and universalist character, allowing it to be replicated by anyone in any place, time or circumstance. It also has a refreshing character, as it aims to overcome the researcher's individual limitations and give a certain degree of security to the observations, experiences, analyzes and interpretations that are made in his name. This means that the method is important to provide legitimacy to the investigative or analytical process.

It is generally used in scientific research, but can be used in any minimally organized and investigative human activity. Thus, although the method used in Science is called scientific, it does not have any scientificity whatsoever, being just an instrument for its construction.

The main scientific methods are the dialectical, inductive, deductive, and hypothetic-deductive methods. The dialectical method arises from the confrontation of ideas, the semantic interplay between provisional questions and answers, always seeking consensus or common understanding through refutations or even disputes; it involves a systemic and continuous dynamics of thought, where a thesis is presented and worked upon in juxtaposition with its opposition (antithesis), with the aim of reaching a satisfactory outcome (synthesis).

The inductive method starts from specific observations to reach general conclusions; in other words, by observing the constancy or regularity of observed phenomena, it is possible to proclaim a generalization in the form of a general or universal law. In this case, the conclusion is broader or more extensive than the reality of specific facts, which is inherently inconsistent. To try to address this situation, statistical tests are employed to indicate the expected margin of error, but even then, the logical inconsistency of applying the properties of parts to the whole is not eliminated. In other words, the inductive conclusion is always something probable but not necessarily true. Despite this limitation, it is the common method used in the natural or experimental sciences.

The deductive method, unlike the previous one, starts from generalizations of known facts to confirm specific cases. In this case, the fact resulting from the conclusion is logically valid but very limited, adding no new knowledge to what is already known. In other words, the conclusions are purely formal, deduced from logic, but only confirm what is already known; nothing new is added to the body of previous knowledge. Despite this limitation, it is a method widely used in the study of mathematical sciences.

The inductive-deductive method is a combination of the two methods mentioned above. It begins with observation for induction, then deduces, and returns to observation, the phenomenon, or the initial problem. Some authors refer to this method as "analysis and synthesis," with analysis encompassing the phases of observation and experimentation and synthesis representing the phase of conclusions, discoveries, and generalizations.

A derived form is the hypothetic-deductive method, which presumes that it is not always necessary to start with the observation of phenomena to generate a hypothesis; it can emerge spontaneously and immediately from imagination, intuition, or common sense. Its proposition is hypothetical, and its verification is carried out through the deductive method. It means that there is no standardized method for all sciences, and no method, by itself, is "scientific." In other words, scientificity does not reside in the method itself but in what can be intellectually constructed based on it; the method is simply a guide for science and not its essence. It serves to direct and not to determine what is valid and true or not.

Sometimes, a particular method is used in isolation, but typically they are employed in combination and simultaneously, with one method complementing the other in the investigative process. Every method is simply a tool for discovery or advancement in knowledge; it can be repeated at any time and place by anyone, but it does not guarantee any truth. Furthermore, no method, whether used alone or in combination, is static or permanent; quite the opposite, it is always subject to change and adaptation to new circumstances, phenomena, or objects of study. The method is a path, not a destination. Its role is to guide the investigator's steps in the quest for understanding unknown phenomena or distinguishing between similar phenomena. Therefore, every method should be open to innovation and adaptation, depending on the nature of the hypotheses raised, as well as the creativity and boldness of the researcher. If science relied solely on fixed and immutable methods, it would stagnate, and it would hardly be more than a factory for producing objects rather than generating new knowledge.

Indeed, it could be argued that Science often divides the whole into its constituent parts to better understand it, while Literature generally takes the opposite approach, bringing together the parts to gain a better view of the whole. However, this is not always the case: in many instances, science also combines after division, and literature divides after bringing together. This is one of the fundamental assumptions underlying the connection between Science and Literature.

Another fundamental assumption of the connection between Science and Literature is language. Language is the primary tool of human communication, and both fields use it to represent reality. Language is also an indispensable element in the creation of a text (from the Latin "texere," meaning to weave). In this context, weaving means bringing words together to create concepts, convey information, evoke emotions, establish principles, and convey values. This means that texts are foundational and disseminating elements of knowledge and culture. Language and text form the foundation of both Science and Literature, and it is through them that books, articles, dissertations, theses, treaties, norms, fables, tales, and speeches are constructed.

Texts are human creations and therefore they always carry traces of subjectivity; hence there is no such thing as a purely objective or exempt text, as claimed by some naive scientists who claim the right to express the truth devoid of any trace of emotion. Text and language are cultural heritages that no human being can fully get rid of.

A text serves the purpose of communication, and therefore, it involves both a sender (who conveys the message's content) and a receiver who receives it; thus, each of them is engaged in the same process. This is why a text is always a construction that only fully realizes itself when there is interaction or engagement between these two agents. Therefore, with the aim of achieving a well-coordinated and harmonious engagement, the sender should always be attentive to the profile of the receiver, and as a result, the text should contain language appropriate to them. This is the reason why a text intended for the scientific community may have a denser and more concise language, while a text aimed at children may use a lighter and more imaginative language.

After all, to what extent do literary and scientific languages typically differ? Science tends to use a concise and monotonous language, based on technical terms specific to the field and aimed at informing and proving. On the other hand, Literature tends to employ a figurative language with the aim of entertaining and stimulating the imagination. As a rule of thumb, scientific discourse is directed toward a select audience, typically peers in the same field, while literary discourse addresses a broader audience, including both peers and the general public.

In general, scientific text is characterized by a referential and denotative language, meaning it is grounded in the real sense of words and aims to avoid different interpretations. On the other hand, literary text is composed of an emotional, metaphorical, and connotative language, based on figurative meaning, which can accommodate various interpretations. However, it is worth noting that there are literary texts that are primarily descriptive, and conversely, there are scientific texts that incorporate figurative language, especially when they have an educational purpose.

Scientific language is primarily explanatory, seeking to inform with precision, but this doesn't mean it should be averse to figures of speech. In many cases, this resource is of fundamental importance to emphasize or add expressiveness to communication and to better convey the information. An example

of this is metaphor, which involves an implicit comparison through words or expressions with a figurative sense.

It is often said that Science is based on objectivity while Literature is rooted in subjectivity, but these two realms are so complex that it is difficult to discern where one ends and the other begins. As stated by Popper, theories precede and guide observation because the human mind is inherently saturated with theories. Thus, scientific objectivity can be similar to that of a literary figure, as both are human beings filled with innate or acquired theories from personal experiences. In this case, objectivity does not depend on the impartiality of the scientist or writer but rather on social discourse and the cultural tradition in which they have always been immersed, whether consciously or unconsciously. In other words, knowledge develops through the free competition of thought, ideas, and theories. There is no knowledge given a priori.

Many argue that objectivity is characteristic of Science and that it can lose its identity if it adopts literary language. Before taking sides, it is important to thoroughly analyze objectivity. Many epistemologists consider that it is nothing special, much less something unique to science. Objectivity is simply the ability to organize subjectivity; every observed object is nothing more than its image instilled in the mind of the observing subject; as a result, each person describes it in their own way. This serves to show that objectivity is relative, and both the scientist and the literary figure can be objective.

Literature and Science are both constructed through language, yet each occupies a distinct place in academic curricula. Literature is typically associated with the field of humanities, while Science is associated with the natural sciences. However, this separation is purely administrative, as human knowledge is unified, and both humanity and culture are offspring and expressions of nature. Both science and literature are integral parts of culture; they are two sides of the same coin. There are no epistemological reasons for artificial separation, let alone hierarchization of the type of information each offers. In other words, both literary and scientific works are equally important and should be regarded as such.

Many argue that Science is a neutral activity and Literature a biased one, but this is neither true nor plausible for two basic reasons: first, because there is no absolute neutrality in any human activity; everything is imbued with subjectivities, reflecting various social interrelationships, starting with the educational and cultural process in which individuals are shaped. The second reason is that Science (and scientists) also have their own tendencies and economic and political interests, whether they are openly revealed or not.

It is also common to claim that Science is focused on rationality and Literature on enchantment, but this is also questionable because both rationality and enchantment are natural attributes of human

beings and often operate together. Enchantment without rationality would be pure foolishness, and rationality without enchantment would be pure apathy.

Due to its strong connection to metaphor, the transfiguration of reality, and the freedom of language, it is often claimed that literary works are based on fantasy, while scientific works are based on reality, and therefore, they are seen as irreconcilable. Perhaps this is why in academia, scientific papers are not considered part of literature, even when they are written in a refined and enchanting language. Similarly, literary works are not typically treated as part of science, even when they address data and information about nature, society, and its phenomena. Clearly, this is a type of intellectual inconsistency that cannot be sustained and should be combated so that the sense of humanity and collective construction prevails.

Also, because literature is strongly linked to subjectivity, it is commonly said that literary knowledge is incapable of producing true knowledge, which is considered a prerogative of scientific knowledge. At this point, it is opportune to reflect on the real meaning of truth, as it is a true chimera, always desired but never possessed by any individual, group, or culture. To claim possession of the truth is the most foolish and perverse lie.

According to the Austrian-British epistemologist Karl Popper, truth does not belong to, nor is it of interest to, Science. Science is based on hypotheses, which should not claim to be true but merely approximate to the truth. Absolute truth does not exist and is not relevant in the scientific field, which is always subject to methodical doubt and the postulation of new hypotheses. Every hypothesis is made to be tested, meaning it allows for experiments and statements that may eventually lead to its rejection. Therefore, every scientist should be interested in challenging a hypothesis to replace it with another, rather than defending it vehemently. In this context, the scientist's job is not to find or possess the truth but to work tirelessly in its pursuit. Thus, truth is a utopia that guides research. True knowledge is not a destination but a way of traveling.

According to this principle, Science is built through a Darwinian process, in which hypotheses and theories evolve through trial and error, with the most adapted or explanatory ones surviving at the expense of others that become extinct or take a backseat. In this case, both successes and errors are indispensable in the construction of knowledge, and as such, no science should claim to possess the truth, only to constantly seek it. Clearly, the process of seeking truth is a right, attribute, or desire that should belong to all forms of knowledge, not just to science.

According to Popper, there are three types of worlds: the material world, the psychological world, and the world of knowledge. The material world consists of embodied and well-structured objects such as animals, plants, and rocks and is studied by natural sciences like Biology, Physics, and Chemistry. The psychological world deals with subjective experiences like feelings and dreams and is studied by mind sciences like Psychology. The world of knowledge is formed by the collective body of knowledge,

including literature, religion, visual arts, scientific knowledge, and all others. Clearly, the world of knowledge does not solely belong to science but to all of humanity.

Whether due to the desire to possess the truth or unfounded mutual antipathies, the fact remains that Science and Literature continue to be separate, especially within academia. In academia, scientific works are rarely treated in the field of Literature, even when they are described in refined and enchanting language. Similarly, literary works are seldom treated in the field of sciences, even when they address relevant biological, biogeographical, or socioeconomic data and information. Unfortunately, there are few inspiring examples of integrated work between scientists and literary figures. Instead, it seems there is a discourse of silence, an uncompromising dichotomy, and a gap that needs to be overcome in the name of coherence and common sense.

The dichotomy between Literature and Science can also be easily observed in curricula, course structures, and even in the physical arrangements of university departments, which often resemble demarcated territories, each with its own defenders, sometimes even bellicose. What a narrow perception! What kind of professional can be expected to graduate from such a disintegrated and alienating academic environment? Certainly, a professional marked by egocentrism and arrogance, which does not bode well for the humanism generally advocated by both fields. Humanism is built on the foundations of tolerance, respectability, and cooperation.

In general, both Science and Literature work to understand and explain the phenomena of the universe, all of which are naturally complex and beyond the reach of any word, mathematical equation, or statistical test. Everything, in all times and places, is not fully knowable by human beings. Knowledge is always an act of approximation to reality and truth, but never its definitive possession. Both scientific and literary discourse are seekers of truths, but not their owners. Therefore, it is pertinent to propose that Science and Literature are branches of the same epistemological rhizome, that both are producers of universal knowledge and promoters of the conditions for a truly free, diverse, and authentic life.

Science and Literature may differ in methodological details, degrees of freedom of expression, and other operational aspects, but not in their conceptual structure or their ultimate purpose in constructing knowledge. Both aim to understand reality, regardless of the type of discourse adopted. Both are professions of faith in what reason can produce. Scientific discourse presents truth to the world as a dream; literary discourse presents the dream to the world as truth. But who can establish definitive boundaries between these two aspects of human nature?

Discussion

In the closing session of the World Conference on Arts Education: Developing Creative Capacities for the 21st Century, organized by UNESCO, the physician and neuroscientist António Damásio emphasized that, as a result of advances in science and information and communication technologies

(ICTs), the world is changing at an unprecedented scale and speed, bringing about many concerns and conflicts of understanding and interest. The progress of science and technology poses the challenge to societies of educating competent, informed, creative, and innovative citizens. Therefore, it is not enough to invest in science and technology; it is necessary and urgent to provide education in arts and humanities. Such disciplines should not and cannot be considered as epistemological or cultural luxuries but as a necessity, as they are crucial for the holistic education of human beings, encompassing a harmonious and simultaneous development of emotion and rationality.

On the same occasion, the manager and president of the Calouste Gulbenkian Foundation, Emílio Rui Vilar, emphasized that an appropriate conception of society implies not only the pursuit of truth, goodness, and abundance but also of beauty and pleasure. In an era where cultural consumption becomes widespread and the boundaries between science, art, and entertainment blur, critical thinking is more necessary than ever. In this context, sustainable development requires the simultaneous and equal participation of all dimensions of human knowledge.

The speeches of these two thinkers, as well as many others who have been studying the educational process and new social trends worldwide, point to the same issue: the need for complementarity between Art and Science. The development of a society based solely on one of these aspects is not sustainable, it is unbalanced and even dangerous in the long run.

Although scientific and literary languages may appear distinct, the motivation for knowledge is always the same. Therefore, it is possible and desirable for these two realms to interact so that knowledge can be fertilized and enriched. After all, rainbows, the sun, water, birds, plants, and all other beings that are objects of Science are also objects of Literature. Few objects in Literature, such as faith, pain, love, suffering, and so many other emotions, were disregarded by the emerging Sciences, but they are now being explored through Psychology, Anthropology, and Neuroscience, among others. Most likely, these and perhaps future sciences will become increasingly interested in this essentially human dimension that was on the margins of scientific investigation for centuries due to incompetence, intolerance, or intransigence.

Scientific texts are typically characterized by hermetic language, incomprehensible formulas, and explanations accessible only to a limited audience. Even works of popular science are often read primarily by experts, losing their intended wider public dimension. It is evident that such works lack a greater allure or charm to attract the lay audience. This is also the task of educators, writers, literary figures, scientists, and all those truly committed to the construction and dissemination of knowledge and the values associated with it.

Due to their formation within an extremely materialistic science, the vast majority of scientists are unable to develop a well-crafted, harmonious, and accessible language for the general public. On the other hand, having been trained in an extremely subjective and discursive field of knowledge, most

literary figures cannot delve into the intricacies of scientific rigor, and their texts often lack substance. Unfortunately, they themselves have little interest in changing this condition, perhaps out of fear of being misunderstood or even punished by the leaders or communities they belong to, which are usually specialized and exclusive. These two extremes end up hindering the interaction of discourses and the understanding of the processes and phenomena they seek to unveil. As a result, the loss is not only for them but for everyone who could benefit from closer collaboration on both sides.

Certainly, if science cultivated beauty more, it would be much more attractive. The beauty of Literature (and also of Science) is essential to attract readers, inspire young minds, spark new ideas, make intellectual work more enjoyable, and even more effective. It may seem paradoxical to emphasize the importance of beauty in scientific works, as Science is always seen as an activity linked to rigor and neutrality, but this is crystal clear in its coherence. Precision does not exclude beauty, and neutrality is nothing more than an arrogant and unfounded premise. Beauty does not harm any type of knowledge, whether it is essentially literary or scientific. In fact, beauty is fundamental to all knowledge because it serves as the driving force that awakens curiosity, motivates reading, stimulates investigation.

Science and Literature are entities or instances that deal with language; both are lenses to see and interpret external and internal phenomena, including intelligence, feelings, emotions, and everything else that naturally occurs in the world and in human beings. Therefore, every science should be interested in all phenomena and not just those that are part of its secular paradigms or are purely materialistic. All knowledge, to be universally shared, must contain a certain dose of poetry.

Thinking poetically is to express objective things in an elegant way. Thus, when the poet Fernando Pessoa states that a poet is a pretender, it is not meant that they are a liar or falsifier of truth, but simply that they can also convey meaning between the lines. In the end—and most importantly—Poetry, Literature, and Science complement each other; they are all human creations, wonderful languages, authentic bridges to progress and creative evolution.

All great scientists are incredibly creative and intuitive. For them, the scientific process calculates, ponders, validates, and demonstrates, but it is imagination that creates. On the other hand, all scientific creation has nothing to do with seriousness or obtuseness of thought. Scientific language can and perhaps should be beautiful to better capture the attention and pleasure of its audience. In other words, knowledge is naturally beautiful, and its advocates do not need to fear this in order to establish themselves as its followers or leaders.

To carry beauty, scientific language doesn't necessarily need to use poems; it can also appear in the form of equations. For example, the mass-energy equivalence, according to the famous equation $E = MC^2$, as well as the expression that "gravitational force is directly proportional to the product of masses and inversely proportional to the square of the distance between them," are highly aesthetic and also poetic expressions.

It's also important to consider that certain poems carry a lot of knowledge, while some scientific articles can be coarse and very poor, pure verbosity. All of this serves to demonstrate that, a priori, there is no clear line of demarcation between poetic and scientific texts. In this case, it's not appropriate to say that poetry bears the mark of aesthetics, while the scientific article must be neutral or aesthetically null. Beauty can be absent or present in both, and in the latter case, both are literary, endowed with the art of writing.

Well-constructed language that is aesthetically pleasing becomes a source of enchantment, and this is essential in the educational process and the promotion of human knowledge. Without enchantment, teaching and learning can become dull and even unworkable. Enchantment should not only be a stimulus for educating children but also a means to pursue broad and profound personal knowledge. Therefore, there is no reason to hide or demonize enchantment in scientific practices and discourse.

Literature and Science are usually considered as distinct lines of human knowledge, each with its own logic and procedures. However, there is an extensive list of logical and operational assumptions that denote the connectivity between them, starting with language, the basic tool of human communication and expression. It is evident that scientific language can be constructed with elegance without losing its vigor. Similarly, literary language can assume the rigor of epistemic knowledge without losing its identity and value.

Based on the postulates outlined above, one can say that a good scientist is not only one who discovers or invents things but also one who is enchanted by them and makes this enchantment the banner of their preaching on behalf of knowledge that is no longer just their own but belongs to the collective.

A good scientist is one who can navigate the intricacies that separate science from other forms of knowledge and delve into the unknown. Therefore, it is desirable that they know how to use and interpret metaphors, as these are also portraits of the reality that surrounds us. Likewise, a good writer is one who has the ability to navigate the intricacies that separate literature from other forms of knowledge and make it an ode to beauty, human development, and the common good.

For many, the utility of Science seems obvious due to the constant advancements and benefits it brings to health, the production of medicines and food, the fight against pests and diseases; to provide comfort and even increase human longevity. However, science has also contributed to the increased depletion of natural resources, environmental contamination, and even the threat to human survival through the weaponry it helped build. For many others, the utility of Literature can be evaluated through its aesthetic sense, the emotions it evokes, and the pleasure it provides. However, Literature can also contribute to evil, the perversion of ideas, discomfort, and the annihilation of the spirit, to the increase of conflicts, and even to the call for war.

Therefore, from the perspective of utility and epistemological relevance, it is impossible to separate Science and Literature, as both can be beneficial or harmful, beautiful or ugly, depending on how they

are used and with what intention. This means that both are two sides of the same coin and can contribute both to the enhancement and depreciation of human conditions and environmental conditions. In this scenario of complexities and uncertainties, perhaps the most important thing is to provide conditions for the boundaries between them to be erased, allowing humanity to extract the best possible from both, for the understanding of life, the world, and ourselves.

Perspectives

The separation between natural sciences and humanities, and more simply between science and literature, is old, but such separation lacks plausible justification, as human knowledge is naturally unified, epistemologically interconnected, and socially constructed. In this case, such division is arbitrary and often the result of misunderstanding, intolerance, or prejudice, which has led to the formation of two relatively isolated cultures with little dialogue between them.

Anyone who associates fiction with literature and truth with science is mistaken. Fiction is the best interpreter of reality when reality, for any reason, becomes utopian and dream-like. On the other hand, all knowledge, no matter how true it may seem, is always uncertain and provisional. Therefore, any hypothesis that claims to be scientific must be testable, meaning it should allow for experiments that can confirm or reject its formal propositions. Hypotheses inherently carry the ever-looming possibility of being replaced by others that are more suitable or explanatory of the phenomena they address and attempt to explain or understand.

Both the literary and the scientific communities strive for the recognition of their works, perhaps because the ideas and data contained within them are destined to become outdated or even forgotten. However, the sense of temporality appears to differ between the realms of literature and the sciences. For literary works, the past matters little, and in many cases, the older a work is, the more valuable it becomes. The revival of Greek art during the Enlightenment is a clear example of this. On the other hand, for scientific works, the past often holds significant importance, and in many cases, it is either overshadowed by novelty or relegated to the background. An example of this is the straightforward replacement of one theory with another, as seen in the transition from geocentrism to heliocentrism.

Determining whether a particular text has a literary or scientific language can be quite complex, especially when analyzing its content rather than just its presentation. However, this may not be as important when one is seeking something that is enjoyable, informative, or constructive within the text. Clearly, both languages are capable of delivering these qualities.

The difference in language does not affect the nature of the object of study; it merely highlights one or more of its aspects. Hence, the limitation of specific sciences, as they are structurally fragmented in their approaches, only focusing on those aspects related to their fields of study while arbitrarily disregarding the rest of reality, as if it had no bearing on the acquisition of minimally true knowledge.

It's important to note that both Science and Literature develop within a certain epistemological and social context, but they also create their own contexts. In this case, the contexts are both determined by and determine the meaning of the concept, and thus all the explanations, guidelines, and strategies adopted in their name. This means that both Literature and Science influence society, but they are also influenced by it. It's undoubtedly a mutually beneficial and constructive relationship.

Each in its own way, both Science and Literature deal with imagination, which is a form, medium, and tool of creation. In other words, imagination is a source of creative inspiration, as can be easily seen in the myth of Icarus, which propelled the development of aviation. Similarly, Leonardo da Vinci's artistic drawings were the spark for the development of the helicopter, diving suit, submarine, and other marvelous machines later created by humanity. This clearly demonstrates that both Literature (and art in general) and Science are fundamental for technological, scientific, and social innovation.

It is a historical fact that eminent philosophers of ancient Greece, starting with Socrates, viewed Literature and art in general with a certain sense of falsification because they operate as representations of reality and not reality itself. However, it was through these representations that concepts were created, refined, and disseminated. It was also thanks to the principle of the possibility of falsification that scientific theories gained their status of effectiveness, excellence, and affirmation.

Many argue that Literature should enlighten and teach through emotion and inspiration, while Science should do the same through reasoning and reflection. It's important to consider that these resources are not mutually exclusive; on the contrary, they complement each other. Furthermore, when well combined, they can promote human knowledge with much more efficiency, effectiveness, and pleasure. Therefore, it is expected that scientific texts are enriched with a certain literary quality, while literary texts are also enriched by scientific discoveries and productions.

It is customary to refer to mathematics and natural sciences (physics, geology, astronomy, chemistry, and biology) as "hard sciences." Typically, the characteristics associated with such sciences include quantifiable data, controlled experiments, testable predictions, mathematical models, statistical tests, and high levels of consensus within the scientific community. Recently, some scholars have also included certain aspects of psychology studied by neuroscience in this category. However, interestingly, little is said about their counterpart, that is, "soft sciences," perhaps because, in this case, hardness has a positive connotation, while softness has a negative connotation. In any case, with the intention of providing more coherence to this play of adjectives, it is important to affirm that every science has its own value, regardless of the degree of hardness or softness that may be attributed to it. This means that no science should be categorized into models of adjectives, as these often only serve to reinforce bonds of prejudice and injustice.

Perhaps with the intention of combating this foolish tendency to hierarchize between the sciences, numerous scholars have been engaged in very educational and inspiring work. For example, Lisa

Zunshine and Brian Boyd study the relationship between Literature and cognition and between Literature and evolution, respectively. David S. Miall also stands out for developing empirical methods for the study of literary reading. In Brazil, there is an international group of studies in empirical linguistics and literature based at the Federal University of Rio de Janeiro, coordinated by Sônia Zyngier, and part of the international project "Redes" (research and development in empirical studies). It is also worth mentioning Richard Dawkins, a combination of writer, cosmologist, biologist, and speaker, and Mia Couto (Antonio Emílio Couto), a mixture of a doctor, biologist, journalist, and writer. One can also refer to past thinkers who made fabulous contributions to the integration of knowledge, being themselves examples of this, such as: Leonardo da Vinci, a leader in intellectual production of his time, a Renaissance figure who excelled in both art and human anatomy, as well as engineering; Johann Wolfgang von Goethe, passionate about light and other aspects of physics, but primarily known as a poet; Galileo Galilei and Isaac Newton, both cosmologists and mathematicians, who made revolutionary contributions to physics; Charles Darwin, a prominent figure in biological evolution, but also a writer in the field of sociology, especially in his fight against labor exploitation by industrial magnates; Alfred Wallace, a notable English researcher who studied biological evolution, landscapes, ethnicities, and forms of socio-economic development; Arthur Charles Clarke, a novelist and inventor in the fields of physics, mathematics, and electronic devices; Gaston Bachelard, a professor of physics and mathematics who advocated for the "scientific spirit" as the hallmark of science but also defended literature as the best instrument of human expression.

In other words, there are strong indications that the separatist movements of the past are losing ground to the collaborative movements of the present, and everything suggests that these will eventually win this unseemly battle among sciences that should, by the nature of their work, be cooperative rather than rivals, let alone enemies.

We are well aware of the difficulty in dealing with both Science and Literature simultaneously. Beyond the lack of talent and personal interest, there is also the deeply rooted historical prejudice in academia, where these two realms of knowledge are treated in separate buildings, departments, and disciplines, with profound consequences for the education of young people, which should always be based on the notion of integrity and collaboration rather than exclusion and selfishness. Perhaps that's why there have been so few scientists capable of using poetic language to communicate the results of their research. Similarly, there have been so few literati capable of handling scientific information in their writings.

Literature and Science emerge at different times and occupy different positions in the tree of human knowledge, but both are rooted in the same substrate of human rationality and creativity. This means that these two branches of knowledge should be considered as belonging to the same genealogical tree of wisdom and inheritors of the same human aspiration to understand, love, and be happy.

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