Georgia Journal of Science

Volume 77 *No. 2 Scholarly Contributions from the Membership and Others* | Article 12

2019

Art Is I, Science Is We

Imani Beverly
Atlanta University Center Robert W. Woodruff Library, ibeverly@auctr.edu

Bryan Briones
Atlanta University Center Robert W. Woodruff Library, bbriones@auctr.edu

Ronald E. Mickens
Clark Atlanta University, rmickens@cau.edu

ART IS I, SCIENCE IS WE

Imani Beverly[1*], Bryan Briones[1], and Ronald E. Mickens[2]
[1]Reference Librarian, Atlanta University Center
Robert W. Woodruff Library
Atlanta, Georgia, 30314, USA
[2]Department of Physics
Clark Atlanta University
Atlanta, Georgia, 30314, USA
*Corresponding author (ibeverly@auctr.edu)

ABSTRACT

The expression of the title has been used for some time to produce a concise summary of the major distinction between "art" and "science." Our goal is to give a fuller and deeper understanding of this statement by discussing its meaning and interpretation within the context of a precise definition of science. We conclude that "Art is I, science is we," captures accurately the fundamental difference between these two disciplines.

Keywords: art, science, personal creativity, public knowledge, logical restrictions, physical realizability

INTRODUCTION

The main purpose of this article is to provide an argument demonstrating the essential correctness of the title statement being an accurate depiction of the distinction between art and science. This way of framing the implied dichotomy is generally attributed to Claude Bernard (Gillispie 1970), who himself attributed it to an unacknowledged poet (Garrison 1928). The fame and popularity of this statement is evidenced by its frequent appearance in the texts of a large number of books such as Barrow (2014) and Livio (2017).

An advantage of viewing art and science in this way is that it also provides a concise and general characterization of these two broad disciplines, which indicates the nonequivalence of these two human-centered activities. Furthermore, the statement resolves the tension between art and science by showing that they fundamentally have different methodologies for creating and interpreting their respective areas of knowledge.

This paper is organized as follows. First, we present brief definitions of science, mathematics and art. Second, we add several relevant comments to clarify and extend these definitions. Finally, the paper ends with a summary of our conclusions on "Art is I, science is we."

WHAT IS SCIENCE?

A detailed discussion of "What is science?" was presented in a previous publication (Mickens and Patterson 2017). The two major aspects of this study can be summarized in the following statements:

(i) Science is the systematic observation, creation, analysis, and modeling of patterns that exist in the physical universe.

(ii) Science provides public knowledge, i.e., knowledge that is available for anyone to examine, test, criticize, and generalize.

A discipline can be considered scientific if and only if empirical evidence and logical analysis rule. These attributes ensure that its various domains of investigations lead to the creation of public knowledge. As a consequence, scientific activities always involve the participation of more than a single individual, i.e. science is a group activity whose major outcome is the generation of valid, accurate public knowledge (Simonyi 2012).

WHAT IS MATHEMATICS?

For our purposes, it is useful to briefly discuss the question, "What is mathematics?" We define it as follows (Mickens and Patterson 2017):

(i) Mathematics is the study, creation, analysis, and modeling of patterns existing in the abstract universe accessible to human thought and mental perception.

(ii) Mathematics is only constrained by the rules of logic.

Note that mathematical structures do not necessarily have to correspond to any actual structures in the physical universe. Since science and mathematics both study "structures," mathematics can be used as the logical consistent fundamental language of science. The importance of this result follows from the realization that ordinary spoken or written language is insufficient to explain or understand the most general scientific concepts or to allow deep understandings of their interconnections. However, both features can be accomplished with the use of mathematical structures which a priori are restricted in their formulation by the rules of logic (Simonyi 2012; Livio 2017).

Finally, just as for science, the discipline of mathematics involves group activity. The acceptance of proofs of theorems must be validated by the community of mathematicians and not rely solely on the originator of a "theorem."

WHAT IS ART?

Art cannot be sharply defined (Ede 2005; Novitz 1996; Strosberg 2015). However, most would conclude that the following disciplines should be included in this characterization: painting, sculpture, music, dance, theatre, literature, architecture, and film. We take the following statement as a working definition of art:

Art is a work, production, or creation done by one or more individuals which is presented as a symbolic representation for others to see, interpret and emotionally experience.

The following comments will help to clarify and expand this definition.

(a) What is to be included in art must be viewed within the contexts of both time and circumstance.

For example, there currently are forms of artistic expressions which did not exist a century ago. Explicit areas include digital art, electronic art and environmental art.

(b) Artistic works may give depictions of objects that cannot exist as actual objects in the physical universe.

Explicit illustrations of this phenomena include the "impossible objects" often found in the work of Maurits Cornelis Escher (Locker 2000; Shlain 2007).

(c) Art is subjective and generally expresses its creations or productions in the form of personal representations and interpretations.

For example, all love poems are unique to their individual writers. No two are exactly alike.

(d) In art, aesthetic considerations determine the value of the creation coming from a given individual or group of individuals. Thus, because of intrinsic differences between individuals in their aesthetic rules and experiences, an artistic creation may be valued differently by different individuals.

This implies that artistic creations and interpretations are unique and discrete.

(e) Art possesses another important and critical feature not held by either science or mathematics, namely, art does not of necessity have to be conceptually constrained in its representations, by either physical laws or the rules of logic.

DISCUSSION

Let us now analyze the statement, "Art is I, science is we," within the framework of what has been presented in this paper. A first major distinction between art and science is the personal nature of artistic creations versus the public nature of scientific endeavors. This implies that artistic works are generally dependent on which artists participate in the creation of the works. If the artists change, then the ensuing art production changes. However, the opposite occurs for scientific efforts, i.e., the eventually determined scientific law or principle takes a form independent of the individuals who formulated and tested its validity (Simonyi 2012).

Second, art is dependent on the corresponding emotional impacts it causes in the observers, and these impacts may vary widely from individual to individual. However, for science, the major consequence is its intellectual impact or influence and this will lead to exactly the same consequences for all persons knowledgeable in the subject matter of interest.

Third, looking back over our definitions of art and science, it may be concluded that the statement, "Art is I, science is we!" captures all the essential attributes of the answers to the questions, what is art and what is science. Further, this compact assertion allows concise characterizations of both disciplines.

Finally, it should be noted that a number of scientists have investigated the art-science connections as fostering the enhancement of creativity in science (Dibbets 2002; Root-Bernstein et al. 2008).

REFERENCES

Barrow, J.D. 2015. 100 Essential Things You Didn't Know About Math and the Arts. Norton.

Dibbets, J. 2002. Interactions between science and art. Cardiovascular Research, 56(3), 330–331.

Ede, S. 2005. Art and Science. I.B. Tauris.

Garrison, F.H. Medical proverbs, aphorisms and epigrams. Bulletin of the New York Academy of Medicine, 4(10), 979–1005.

Gillispie, C.C., ed. 1970. Claude Bernard. Dictionary of Scientific Biography. Charles Scribner's Sons.

Livio, M. 2017. Why? What Makes Us Curious. Simon & Schuster.

Locker, J.L. 2007. The Magic of M.C. Escher. Harry N. Abrams.

Mickens, R. and C. Patterson. 2019. What is science? Georgia Journal of Science, 74(2), article 3. https://digitalcommons.gaacademy.org/gjs/vol74/iss2/3.
Novitz, D. 1996. Disputes about art. Journal of Aesthetics and Art Criticism, 54(2), 153–163.
Root-Bernstein, R., L. Allen, L. Beach, R. Bhadula, J. Fast, C. Kremkow, J. Lapp, et al. 2008. Arts foster scientific success: avocations of Nobel, National Academy, Royal Society, and Sigma Xi members. Journal of Psychology of Science and Technology, 1(2), 51–63.
Shlain, L. 2007. Art and physics: parallel visions in space, time and light. HarperCollins.
Simonyi, K. 2012. A cultural history of physics. Translated by D. Kramer. CRC Press.
Strosberg, E. 2015. Art and science. Abbeville Press.