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Postmodern Biology: Breathing Some Soul into a Listless Life Science

Nature is earlier than man, but man is earlier than natural science.

-Carl Friedrich von Weizsäcker

In *Physics and Philosophy* Werner Heisenberg contemplates quantum theory and the physicists who enhanced the traits of this new species of science. An abstract and unclassified species that revealed nature as contradictory, uncertain, and even "absurd" at times. Early 19th century physicists were especially intrigued by this new biology because quantum laws contradicted the laws of classical Newtonian physics which led to an endless set of challenges for hungry scientists determined to formalize quantum theory to better blend in with its predecessors. However, because Quantum theory was a hybrid species born from both possibility *and* reality, "it introduced something standing in the middle between the idea of an event and the actual event" (42), referred to by Heisenberg as "a strange kind of reality" that was dangerously easy to manipulate. This essay begins with an amateur psychoanalysis of quantum theory and a brief exploration into its genealogy and birth. I will be using the insights of Roger Masters, George Stanciu, Galileo, Richard Dawkins, and Leon Kass to help bolster my argument for why it is unreasonable to believe that biological phenomena can be fully understood without first acknowledging the undeniable chemistry that exists between science and teleology and the significance of their soul connection.

Heisenberg states that "the spirit of modern physics will penetrate into the minds of many people and will connect itself in different ways with the older traditions" (32) and wonders exactly how biology, in its current stage of youthfulness, will wrap itself around the soul of such powerful, antient traditions (32). Is a deep and meaningful connection even possible for such a dualistic pairing? What could such a young and vibrant approach possibly have in common with someone as old as ancient philosophy? Heisenberg's main concern is that older traditions,

particularly the ones very set in their reality, will find the complicated nature of modern physics too difficult to relate to, causing high levels of discomfort and confusion for this older sect who will not only find modern physics a threat to their space and time but will also struggle to keep up with quantum's modern energy (32). Alternatively, physicists who closely followed the development of quantum theory throughout the 20th century will not feel as threatened by her behaviour, especially those well versed in the "Copenhagen interpretation" of this branch of science which Heisenberg notes "starts from a paradox" (46). It was a paradoxical starting point because classical physics never considered admitting to the possibility of a deficiency of knowledge within its experiments, whereas quantum theory does just this. In fact, quantum theory acknowledges *two* things according to Heisenberg "partly fact and partly our knowledge of a fact" (47) expressed in the "probability function" which accounts for possible error in the experiment, or to be more precise, "a deficiency in our knowledge of the electron" (47). And while it may be true that the language of classical physics is more exact than modern physics, modern physics can describe "a whole ensemble of possible events" (Heisenberg 54) in a way that classical physics cannot. In a sense, we see quantum theory now representing the truth. The truth about nature no less, which we realize, is contradictory. This is the "paradox" that Heisenberg was referring to.

There is an eerie quote by the late English novelist, Terry Pratchett, who once wrote "she was already learning that if you ignore the rules people will, half the time, quietly rewrite them so that they don't apply to you." In simple terms, quantum theory was the troublesome girl who ignored the rules yet was so perplexing the world had no choice but to accommodate around her. For some reason, the world behaved differently when she was around, and she behaved differently when being observed by the world. This revelation resulted, in part, from the famous "double slit experiment" (e.g. see fig. 1) which introduced, for the first time ever, an abstract mathematical quantity to the field of science. The birth of quantum theory.

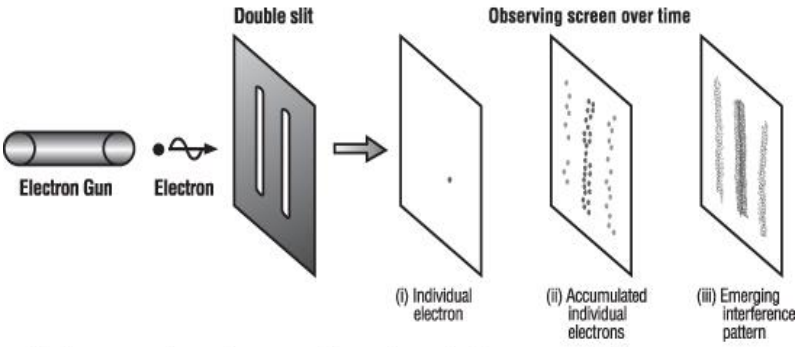

Fig. 1. The Double Slit Experiment

It was not long before quantum theory became a threatening presence in the world, and this was the case for three reasons. First, she was uprooted many times which led to risky and destructive behaviour. Second, she was a freethinker and a nonconformist which vexed her neighbours greatly. And third, she altered the reality of our sense experience because her "contrary" behaviour completely changed the way we perceive space and time. Initially, her unique *potentia** was referred to as the "probability wave" which revealed the "strange" dual character of quantum mechanical phenomenon (Heisenberg 43). It was realized at this point in history, that matter (atoms and molecules) in addition to energy or "light", could behave as both waves *and* particles as opposed to waves *or* particles, which was the formerly held belief (Heisenberg 38). Scholarly physicists unaccustomed to subjective elements within scientific theory were especially frustrated by this unpredictable behaviour, therefore, determined to come up with a formula that could calculate the probability of her (nature's) actions (Heisenberg 51). However, in *Physics and Philosophy*, Heisenberg warns us about the "subjective element in the description of atomic events, since the measuring device has been constructed by the observer" (57). He reminds us that "what we observe is not nature in itself but nature exposed to our method of questioning. Our scientific work in physics consists in asking questions about nature in a language that we possess and trying to get answers from experiment by the means that are at our disposal" (Heisenberg 57). This quote aims to reveal the rapacious nature of new biology and the various methods that scientists began using to get exactly what they wanted out of nature

*Potentia is a principle used in Aristotelian philosophy used to analyze motion and "possibility" in general. It stems from the ancient Greek word *dunamis*.

exactly when they wanted to. Within this context, we see quantum theory becoming the prey, vulnerable to manipulations, defenseless against the predatory "life" sciences and the probing tools used to answer the even more probing questions, it consciously sought to ask her. Arguably, this harassment would not have taken place if quantum theory had been given the tools that she needed to protect herself from attracting this negative attention in the first place. Thus, we confront the failure of her two very loveable yet arguably jaded parents, science and religion.

In *The Ambiguous Legacy of the Enlightenment*, Roger Masters reflects on the long and complicated relationship between religion and science and what makes their history with each other so relevant in the postmodern era we find ourselves. In 1995, Masters thought that the issues separating science and religion "too deep" and "too explosive" for resolution to occur due to "contemporary political events" (107) at the time. Presumably, he is referring to the first-ever use of atomic bombs during WWII, the devastating effects caused by the antagonism that persisted between science and religion, but most of all, the unfair advantage the West failed to communicate to his Eastern counterpart. This kind of climax was, of course, the result of dualistic and angry passions that could not be tamed between these two highly charged political bodies and the intense pressure that was building up inside them. Masters, delves even further back into the "Baconian" era of their relationship when science attempted to "conquer" and "control" his natural surroundings using modern scientific methods to manipulate the situation (108). This egotistical attitude became the hallmark of the scientific revolution and the inductive approaches that were about to dominate the time-period. For science's mistress, teleology, it was a long and calculated era of teasing and tantalizing without any skin-to-skin contact. Physicist, professor, and author Dr. George Stanciu reflects on this stage of modernity recalling some of Francis Bacon's main rules of conduct regarding foreplay. Rules that science was legally bound to due to his long-standing marriage with religion and the tangled history that held these two systems together. The rules according to Stanciu were as follows. "The scientist touches the experiment, and the experiment touches nature. The scientist has no direct contact with

nature…scientific instruments touch nature…" (Stanciu 58). According to Stanciu, this form of interplay not only "vexes nature" terribly, but is also, disturbingly, "the path to commanding nature" (59) as well. Somehow, these elusive methods worked to expose nature in a manner that turned out to be even more invasive and revealing than if she had been touched by science directly notes Stanciu, who recalls the two main admonitions Bacon made to scientists in pursuit of "the truth" in the *Great Instauration*. It should also be noted at this point, that this proposed reformation was designed deliberately to emulate (or possibly replace) biblical tradition, specifically, the six-days of creation which was "mirrored" by Bacon's six-part methodology in this work. His first admonition was that it was necessary for scientists to ignore religious principles and philosophical doctrines in pursuit of the truth because the new experimental method did not overlap with the divine and moral realms supposedly (Stanciu 60). The second one, was that knowledge must be perfected and governed so that it could fulfill its "true" purpose which was to be sought "for the benefit and use of life" (Stanciu 61). However, his article titled "The Copernican Revolution: The Defining Event of Modernity" Stanciu remarks that this second admonition reveals the major underlying flaw of Bacon's *Great Instauration* which not only implies a chaotic and spontaneous account of creation, but also conveys humans as immoral and vicious beings who must be forced into submission (61). This was a design flaw that would have a profound effect on the deep and meaningful ties between science and teleology, severing their soul connection whilst leaving science open to foster his artificial connection with religion, resulting in wedlock.

This relationship was artificial because the love between science and religion was insincere from the start with which led to a dysfunctional and strained relationship marked by codependency and mistrust. Shortly before Bacon's influence, we see signs of deceit already taking place between these two systems in Galileo's *Letter to the Grand Duchess Christina of Tuscany* written in 1615, which was written approximately five years before the *Great Insaturation* was published. When we realize that religion's family (the church) was heavily dependent on science to get astronomical information for their calendars, we begin to understand religion's key motives for pursuing science and how his intellect was *used* for religion's own

personal gain and self-seeking interests. This letter also helps to explain why religion's father, the Pope, initially gave Galileo his blessing to publish something that would, in many ways, keep science away from his mistress and soulmate, teleology. However, when science realized that religion's interest in him was superficial, it caused resentful feelings to arise, compelling science (in this case, Galileo) to deliberately anger religion's father (the Pope), by publishing his book on Copernicus' theory in Italian, giving his book a much wider readership. In Galileo's letter to the duchess, we feel a sudden shift in power, when science warns religion that her family (theologians) will have to adjust their teachings to the discoveries of science as they arise (44), which marks a turning point in history for science who seemed to take a dominant position over religion thereafter. This power shift was difficult for religion who had long been accustomed to the throne. And although religion's jurisdiction was clearly waning, science, as well as some of his contemporaries, humored religion by temporarily referring to her as the "queen of sciences" which we realize, was an insincere attempt at flattery designed specifically to help ease her into her subordinate role and the increasing demands that science places on religion as punishment for her deceit.

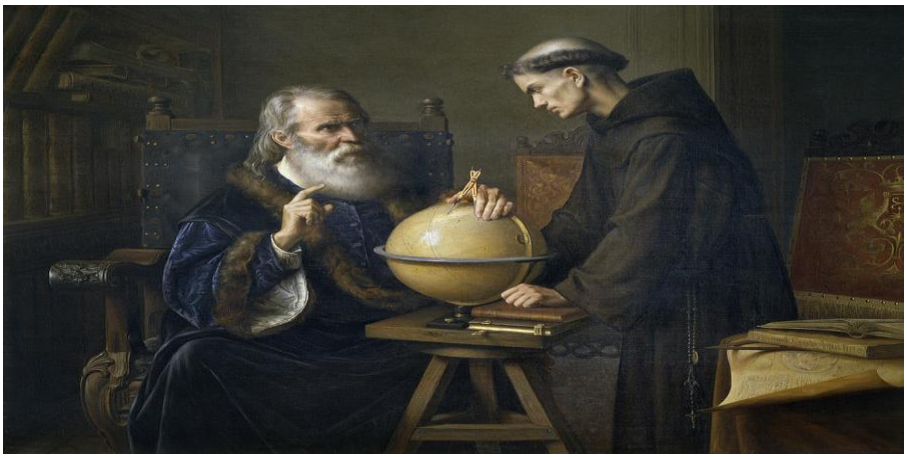

Fig. 2 Galileo Galilei demonstrating his new astronomical theories at the university of Padua by Félix Parra

Ever since sciences' elevation of power occurred in the 17th century, many self-proclaimed atheists leveraged this authority by building off and "up" from the Baconian era and the trending empirical methods which became the new standard for excellence. Whether intentional or not, many of these theorists severely lessened the validity of theology overtime,

particularly the ones that made strong arguments against the possibility of design in the universe. By 1986, Darwinian enthusiasts did not even have to look beyond the title of Richard Dawkins' popular book, *The Blind Watchmaker: Why the evidence of evolution reveals a universe without design* to feel an overall sense of satisfaction. Considered to be one of the most influential pieces of writing on evolution since Darwin himself, Dawkins presents hungry materialists with all the arguments necessary to continue upholding and defending their purposeless interpretation of nature and their place in it. In chapter 3, Dawkins uses a computer model to help illustrate "single-step selection" and "cumulative selection" in nature while fairly admitting to the program's limitations. He says that in "single-step selection", non-living things are sorted coincidentally according to the laws of physics with no interference by a moral agent. Unlike cumulative selection, each successive set of mutations (in single-step selection) does not build on preceding mutations which are inherited in the next sequence (Dawkins 58). Cumulative selection becomes a continuous, fluctuating, and unpredictable process from a biological standpoint compared to single-step selection, which is a much more determinant process, or in Dawkins words "a single coincidence" (58). This distinction is relevant to his theory because it helps to fill in critical gaps within the Darwinian premise by acknowledging the *non*random element that is missing from Darwin's theory of evolution. However, this acknowledgment still does not lead to a universe with design or intelligence according to the author who repeatedly insists that evolution has "no long-term goal" (61). In one of Dawkins most memorable lines, he loosely refers to final causes as an "absurd notion" resulting purely from "vanity" when he states:

> There is no long-distance target, no final perfection to serve as a criterion for selection, although human vanity cherishes the absurd notion that our species is the final goal of evolution. In real life, the criterion for selection is always short-term, either simple survival or, more generally, reproductive success. If, after the aeons, what looks like progress towards some distant goal seems, with hindsight, to have been achieved, this is always an incidental consequence of many generations of short-term selection. The 'watchmaker' that is cumulative selection

is blind to the future and has no long-term goal. (Dawkins 61)

Up close, these claims are not all that threatening, and may even hold some truth. However, when we examine these claims from a bird's eye view, or rather, a global perspective they can be easily mistranslated to "Our existence as a species on earth is meaningless and it would be vain to think otherwise. Our existence is the result of a random mistake, as was the existence of all our descendants.", which is likely not the message that Dawkins hopes for his readers to digest. Ironically, it is the logic that undermines humanity in this case. Logic so persuasive that words like "gods" and "deities" begin sounding like foreign concepts by comparison, and increasingly foolish sounding ones at that, especially perhaps for those who have never known religion. But are not these the very ones who need to find purpose in their life most of all? Or is it that "our" matrix only makes sense when a certain amount of us lead a purposeless existence, therefore, the "success" of society is dependent on a certain portion of us being faithless and leading materialistic lifestyles? Let me defend this accusation from my agnostic position in the following paragraph.

When scientific materialism becomes the leading doctrine in any given civilization, religion is no longer considered a civic virtue. Consequently, any moral and ethical beliefs and values bound to theology take a back seat to scientific materialism and the leading thinkers powering the revolution. We now live in a society that has become heavily invested in the principles of this secular doctrine because in many ways our survival is now dependent on citizens becoming followers of scientific materialism. However, the looming question remains: Do we want to provide humans with a coherent argument that effortlessly justifies ones materialistic lifestyle? Do we, as a society, deserve this vindication? In my opinion, any civilizations which have not already fallen victim to this doctrine, should take this as a lesson learned. A lesson that the West learned first and now we are reflecting on that lesson. For those who feel unsatisfied or discomforted by their reflections, it is because scientific materialism has led us to an incomplete understanding of ourselves and the universe.

This is because biological phenomena cannot be fully understood without acknowledging the intrinsic and transcendent purposiveness of the living organism in question. Thus, we are

directed back to Aristotle's teleological view of nature which recognizes final causes. As Leon Kass says in *Toward a More Natural Science*, "we must regard living things as purposive beings" because Aristotle's "that for the sake of which" continues to be an "indispensable part of an understanding of natural phenomena" (254). Living things come to be by a process that has a natural end or *telos**. And while it is true that all living things do have a structural element to them which can be explained in mechanistic terms, a mature organism functions as one whole "in characteristic ways above and beyond merely maintaining itself" (Kass 254), hence, we need to support this natural need to thrive. How can we best support this need? We need to revert to a teleological natural science again because this is how it was always meant to be. Science and teleology, were always meant to be together because they are each one half that, together, form one whole. Simply stated, these two fields need each other. But they need each other *because* they love each other. Religion and science on the other hand, love each other because they need each other. Do you see the difference? In another book by Kass titled *Leading a Worthy Life: Finding Meaning in Modern Times*, Kass refers to these two systems as "the twin sources of Western Civilization" (187) and reminds us that religion and science, was formally "science [and] philosophy" or even "divine revelation and human reason" to the ancients (187). This evolution is significant because not only does it show us that religion was an artificial construct that obstructed the natural chemistry between science and teleology but that science and teleology, have always had a connection. Better yet, a *soul* connection. Kass explains how the "new sciences" (genetics, neurobiology, and evolutionary psychology) differ from the ancient sciences and why these differences matter, literally. In fact, the term "life science" sounds more like an oxymoron after he is finished outlining biology's main characteristics, none of which can explain "what life is or what is responsible for it" (192) and argues that modern science "has made enormous progress precisely by its metaphysical indifference to questions of being, cause, purpose, inwardness, hierarchy, and the goodness and badness of things" (190). This suggests that religion has, in many ways, enabled her partner over the years, passively allowing science's ego to become inflated, ironically, due to his own selfish demands. Worst of all, this unhealthy

*Télos is a Greek word used to explain the inner purposiveness of something. Aristotle frequently used this word in his philosophy when referring to the "end", "goal", or "objective" of a living thing.

marriage has prevented science from re-establishing a meaningful connection with teleology who would not only share his everlasting passion for the truth but would also help nurture his spirituality while fulfilling this passion.

Thus, we see an unconsummated union between our two most eminent systems (teleology and science) leaving science largely untouched by teleology, or perhaps more accurately, teleology untouched by science. Why is it so crucial that these two fields penetrate? Because "soulless science" *longs* for spiritual penetration according to Kass who describes modern biology as a single and self-sufficient discipline that is entirely void of "feeling, passion, awareness, imagination, desire, love, hate, and thought" (192). Sadly, we learn that it is the long-term objectification of science which has caused this emptiness that "diminishes the significance of our felt inwardness" (192) as stated by Kass, who connects science's emptiness to a lack of morality. Yet Kass assures us that "such moral poverty need not be embarrassing either to science or to religion [since] scientists never claimed to speak on moral matters, and religion remains available to speak where science is silent" (194). However, it remains to be seen what kind of after-effects religions' proxy power will have on science in the long run and whether these two systems will realize this codependency and their need to separate from each other. At the risk of sounding dramatic, the fate of humanity rests on this divorce taking place essentially.

Without a belief in the soul, how far can our life sciences take us? What is science without teleology? What is teleology without science? Are these two systems symbolic of the dualism that exists in nature, and if so, which is "mind" and which is "matter"? Which is "waves" and which is "particles"? The truth of the matter is that we will only be able to gain this knowledge when biology and teleology realize their soul connection. Hence, the time has come for science and religion to divorce so that science can be with teleology instead because science and teleology were designed for each other. Because teleology and science have undeniable chemistry with each other and because teleology loves science in a way that religion does not and cannot. Because teleology's love for science is unconditional, eternal, and true and because science and teleology are "one soul inhabiting two bodies" which even the wise Aristotle believes *is* love.

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