

A “Consilience of Equal Regard:”

Stephen Jay Gould on the Relation of Science and Religion

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Abstract

This paper considers the views of the American biologist Stephen Jay Gould on the relation of science and religion in the context of his important critique of Edward O. Wilson’s *Consilience* (1998). Gould is best known for his celebrated notion of “non-overlapping magisteria,” which is often seen in somewhat negative terms as inhibiting dialogue. However, as a result of his critique of Wilson’s unificationist approach to knowledge, Gould later made increased use of the more positive notion of a “consilience of equal regard,” which recognized the porous nature of disciplinary divides and the propriety of interdisciplinary dialogue. His final approach to the relation of science and religion, set out in *The Hedgehog, the Fox, and the Magister’s Pox* (2003), published after Gould’s death, affirms the distinctiveness and autonomy of science and religion on the one hand, while encouraging their constructive dialogue and productive interaction on the other. This, it is argued, should now be seen as Gould’s definitive statement on this question.

The paleontologist and evolutionary biologist Stephen Jay Gould, one of America's finest scientific communicators (Allmon, Kelley, and Ross 2009), made fundamental contributions to evolutionary biology, not least through his development of the ideas of "punctuated evolution" (Gould 2002, 759–61; Eldredge 2013) and evolutionary "spandrels" (Müller, 2013), and his use of the decidedly 1990s metaphor of "rewinding the tape" of evolution to highlight the importance of contingency within the evolutionary process (Beatty 2006; Turner 2011). His reputation as a scientific educationalist is based on his masterpiece *The Structure of Evolutionary Theory* (Ayala, 2005). Gould is, however, probably best known to readers of this journal for his notion of "Non-Overlapping Magisteria (NOMA)" (Gould 1997; Gould 1998, 269–83), particularly as this is set out in his book *Rocks of Ages* (Gould, 1999).

Gould was not a religious person, and self-defined as an "agnostic in the wise sense of T. H. Huxley" (Gould 1999, 8–9). Yet he considered the interaction of science and the humanities in general, and religion in particular, to be a topic of significant cultural concern, better framed in terms of conversation rather than antagonism (Gould and Purcell 2000). In the late 1990s, Gould argued that science and religion represent separate and nonconflicting realms or "domains of authority (*magisteria*)," suggesting that he found this idea in Pope Pius XII's encyclical *Humani Generis* (Gould, 1997). For Gould, science deals with the empirical realm, and develops theories to explain the observed facts of nature; religion deals with the realms of ultimate meaning and value. While both these *magisteria* are essential for human fulfillment, they represent different outcomes of different rational processes. Gould's early formulation of this principle, which is best seen in *Rocks of Ages* (1999), takes the following form:

I do not see how science and religion could be unified, or even synthesized, under any common scheme of explanation or analysis; but I also do not understand why the two

enterprises should experience any conflict. Science tries to document the factual character of the natural world, and to develop theories that coordinate and explain these facts. Religion, on the other hand, operates in the equally important, but utterly different, realm of human purposes, meanings, and values – subjects that the factual domain of science might illuminate, but can never resolve (Gould 1999, 4; cf. Gould 2003, 87).

Gould's concept of "non-overlapping magisteria," generally interpreted as asserting the "independence" of science and religion (Barbour 2000, 95–7; 99–100), has been criticized as an impediment to progress in the field of science and religion. Two representative criticisms should be noted. John Polkinghorne suggested that this view was "neither experientially supported nor rationally justifiable." For Polkinghorne, Gould offers a "rationally unsupportable" account of the relation of science and religion, which is rendered problematic through even the "most cursory acquaintance with the intellectual history of the last four centuries," which makes it quite clear that they cannot "be isolated from each other in watertight compartments" (Polkinghorne 2005, 44). The philosopher John Caiazza considered it to represent an unwelcome, if unintended, reprise of the medieval philosopher Siger of Brabant's problematic notion of a "double truth" (Caiazza 2005, 11–12), which resolves contradictions between intellectual domains such as theology and philosophy by treating them as "contrary truths," each of which is valid within its own domain. Although recent scholarship has raised significant doubts about whether Siger of Brabant explicitly held such views (Giletti, 2021), Caiazza's concern about the intellectual isolationism that Gould's approach appears to entail remains significant.

Yet these representative expressions of concern relate to Gould's formulation of NOMA in the late 1990s. This paper argues that Gould's critical reading of Edward O. Wilson's *Consilience* (1998) appears to have prompted him to modify his earlier approach. In *The Hedgehog, the Fox, and the Magister's Pox* (2003), published after his death, Gould offers a more nuanced and expanded account of his earlier approach, which represents his most considered assessment of the relation of the sciences and humanities (York and Clark 2005, 290–3), reframing the notion of “non-overlapping magisteria” in more positive terms as a “consilience of equal regard.” This paper will consider this final articulation of his position, exploring how it emerged, how it meets some of the criticisms directed against his earlier position, and noting some unresolved issues that appear to require further engagement.

What is “Consilience”?

The term “consilience” was first introduced by the British empirical philosopher William Whewell (1794–1866) in the 1840s as a result of his dissatisfaction with Aristotle's account of how it was possible to proceed from observations to general principles. Whewell's main criticism of Aristotle was that he failed to give adequate attention to the need to introduce new ideas or concepts, such as some kind of “organizing principle,” which was integral to the process of scientific explanation (Niiniluoto 1994, 52–4). Whewell invented the term *consilience*, drawing on a Latin root meaning “jumping together” to refer to this process of leaping from an assembly of observations to their explanation through some “coordinating principle” which was not strictly and unambiguously disclosed by those individual observations themselves. Whewell envisaged an imaginative act of leaping beyond what the observations disclosed, and using this resulting interpretative framework to coordinate those observations. The degree of coordination – or “colligation” – that this framework afforded could be seen as an indication of its reliability (Cowles 2016; Dethier 2018).

So why did Gould become interested in the relatively obscure British philosopher William Whewell, and the neglected notion of consilience? The answer lies in the first of three mottos that Charles Darwin included on the title page of his *Origin of Species* (1859). Darwin here reproduced a brief passage from Whewell, stressing the importance of establishing general laws underlying the phenomena of the material world. “But with regard to the material world, we can at least go so far as this – we can perceive that events are brought about not by insulated interpositions of Divine power, exerted in each particular case, but by the establishment of general laws” (Darwin 1859). This passage, taken from Whewell’s influential “Bridgewater Treatise” of 1834 (Whewell 1834, 356; cf. Topham 2010), hints at the importance of Whewell’s empirical philosophy to Darwin’s own intellectual development.

In a paper of 1975, Michael Ruse argued that Whewell’s notion of the consilience of inductions was of decisive importance in enabling Darwin’s appreciation of the evidential virtues of his theory of natural selection from 1838 onwards (Ruse 1975; cf. Ruse 1979). In a careful 1986 study of Darwin’s historical methodology, which draws on Ruse’s analysis, Gould offered an insightful account of how Darwin was able to weave together seemingly disparate and disconnected biological arguments to yield a coherent theory – despite the fact that this evidence did not, and could not, prove his theory – as writers such as Thomas H. Huxley hoped it would, through some dramatic and conclusive experiment. Gould summarizes Darwin’s methodological insight incisively using Whewell’s terminology: “Huxley sought the elusive crucial experiment; Darwin strove for attainable consilience” (Gould 1986, 65; cf. Gould, 2002, 108–11).

Gould's appreciation of Whewell's importance in helping Darwin develop his theory of natural selection is clearly grounded in a good understanding of Whewell's intellectual method, which is analysed in some detail in *The Hedgehog, the Fox, and the Magister's Pox* (2003). As Gould's editor Leslie Meredith notes, this work, which was published after Gould's death, is unusual. Most of Gould's popular works took the form of collections of already-published essays (Gould 2003, xi); this late book, however, is an original work, devoting more than 100 pages to a detailed account of Whewell's theory of consilience, and a critique of Wilson's use of this concept in his *Consilience: The Unity of Knowledge* (1998).

Probably reflecting the emphasis placed on the notion in Wilson's *Consilience*, the term "consilience" has now come back into fashion after an extended period of neglect as a way of stimulating and informing discussions of the relation of the natural sciences and the humanities (Carbonell 2011; Di Rocco 2018). In what follows, we shall consider Wilson's *Consilience*, both as a work of importance in itself (Wilson, 1998a), but also a stimulus to Gould's further reflections on the relation of the natural sciences and the humanities in general, and religion in particular.

E. O. Wilson on Consilience

Although Wilson is today better known for his abandonment of "kin selection," a theory that he helped popularize during the 1970s (Gibson 2013), he attracted much attention around the turn of the century for his unificationist approach to knowledge, set out in his 1998 work *Consilience*. "We are drowning in information, while starving for wisdom. The world henceforth will be run by synthesizers, people able to put together the right information at the right time, think critically about it, and make important choices wisely" (Wilson, 1998, 294). This emphasis on "synthesizers" can be seen as the culmination of the unificationist program

that he initiated twenty years earlier with the publication of his *Sociobiology* (Carbonell, 2011, 346–6). Wilson presents the idea of consilience in this 1998 manifesto for the unification of human knowledge in terms of the “basic scientific principle of cross-disciplinary consistency” (Lo 2013, 270).

Wilson notes the growing trend to regard the natural sciences, social sciences, and humanities as separated “by an epistemological discontinuity, in particular by possession of different categories of truth, autonomous ways of knowing, and languages largely untranslatable into those of the natural sciences” (Wilson 1998b, 17). Gould also recognizes this concern, and shares Wilson’s concern to counter the trend towards intellectual fragmentation. Yet their strategies for achieving this goal, and their respective understandings of the nature of consilience, diverge significantly.

Wilson’s formulation of the “unity of knowledge” in terms of “universal consilience” sets out an intellectual framework for holding together the plurality of insights that arise across the disciplines. Throughout his works, Wilson appears to exhibit “what might be called a general unification wish” evident in his “desire to produce order out of chaos” (Seegerstrale 2006, 47). In line with Wilson’s earlier writings, this approach to the unification of human knowledge is based on a “metaphysical worldview” which privileges the scientific method over those of the humanities. While Wilson intertwines the natural sciences, the social sciences and the humanities in his notion of consilience, there is never any doubt about the dominant partner in this synthesis.

The central idea of the consilience world view is that all tangible phenomena, from the birth of stars to the workings of social institutions, are based on material processes

that are ultimately reducible, however long and tortuous the sequences, to the laws of physics (Wilson 1998a, 291).

Wilson considers this a natural and reasonable consequence of the superior explanatory capacities of the natural sciences. For Wilson, consilience is ultimately a “metaphysical world view,” which is “allegiant to the habits of thought that have worked so well in exploring the material universe.” While it “cannot be proved with logic from first principles or grounded in any definitive set of empirical tests,” it still claims to offer the best way of rationalizing the intellectual habits of the social sciences and humanities (Wilson 1998a, 9). Wilson himself concedes that such theories are “working hypotheses,” promissory notes rather than proven scientific facts (Wilson 1998a, 248–54).

Wilson’s approach to the pursuit of unity of knowledge is illustrated by his understanding of the place of philosophy within this spectrum of possibilities. “Philosophy, the contemplation of the unknown, is a shrinking domain. We have the common goal of turning as much philosophy as possible into science” (Wilson 1998a, 11). Wilson anticipated being criticized for his “ontological reductionism” and “scientism,” but treated this as a badge of honor (Wilson 1998a, 11). These reductionist and scientistic tendencies are especially evident in his account of the origins and nature of religion (López 2011), in which the perceived explanatory power of evolutionary theory plays a decisive role. Wilson cites in his support Alexander Rosenberg, who he generously lauds as one of philosophy’s “most distinguished practitioners.” Rosenberg would today be seen as representing a philosophically controversial strong form of scientism, which reduces reality to what physics is able to disclose (Rosenberg 2011; cf. Pigliucci 2016; Ridder, Peels, and van Woudenberg 2018).

Although Wilson occasionally presents his project as a dialogue between the sciences and humanities, it has to be said that both the dominant intellectual substance and the rhetorical tone of *Consilience* is that of the natural sciences conquering the humanities (Bernstein 1998; Burnett 1998; McCarthy 1999, 842–63). Where some aim to encourage dialogue between the sciences and humanities, a close analysis of the rhetoric of *Consilience* suggests that it seems to have been intended to “fuel interdisciplinary hostilities” (Ceccarelli 2001, 128–56). It is, for example, difficult to instance points at which Wilson explicitly allows that the humanities might help achieve a better understanding or implementation of the natural sciences. While many will be sympathetic to Wilson’s appeal for the synthesis of the various elements of human knowledge in the quest for wisdom, there seems to be no two-way traffic envisaged in the pursuit of human wisdom; the only hope of progress in achieving wisdom appears to lie in increasing the influence of the natural sciences. Wilson’s critics thus point, for example, to his explicitly stated desire to capture “the moral realm and render it under scientific and material control” (Seegerstrale 2006, 47; cf. Klinefelter 2000).

Though presenting his approach as a responsible quest for a foundation of the unity of human knowledge, Wilson ultimately lays a theoretical framework for the scientific domination of the humanities through the use of scientific “bridging disciplines.” “Confidence in the unity of knowledge – universal consilience – rests ultimately on the hypothesis that all mental activity is material in nature and occurs in a manner consistent with the causal explanations of the natural sciences” (Wilson 1998b, 18).

Wilson’s assertion of the intellectual hegemony of the natural sciences, particularly evolutionary science, is grounded in the capacity of the sciences to position and reductively explain other disciplines through what might now be described as a “metaphysics of power

and influence” (Corry 2019, 216). In his important study of the rationale of theory choice in considering rival moral traditions, the philosopher Alasdair MacIntyre makes the point that a worldview or narrative which seeks to achieve intellectual or cultural hegemony over its rivals needs to show that it is “able to include its rivals within it, not only to retell their stories as episodes within its story, but to tell the story of the telling of their stories as such episodes” (MacIntyre 1990, 81). MacIntyre’s reflections cast light on Wilson’s strategy at this point. For Wilson, it is important to be able to show that the social sciences, the humanities, and religion can all be located, accommodated and evaluated within the greater explanatory capacity of the natural sciences. To claim to be able to explain something scientifically is thus an implicit assertion of the intellectual hegemony of the natural sciences.

Wilson’s understanding and implementation of the concept of consilience suggests that it has little value for those concerned with fostering a two-way intellectual dialogue between, and mutual understanding of, science and the humanities. Recognizing this point, some scholars have more recently sought an approach to consilience which avoids such an explicit privileging of the natural sciences. Slingerland and Collard, for example, argue that Wilson’s approach creates the impression that “consilience involves the sciences engulfing the humanities – a prospect that is understandably off-putting for humanists ... it is better to think of consilience as an attempt to develop a new, shared framework for the sciences and humanities” (Slingerland and Collard, 2011, 4), including the relation of science and religion. Yet it has to be said that even those who have subsequently expressed a preference for this more sophisticated “second wave” of consilience still offer in practice what many would consider to be a reductionist account of the origins of religion (e.g., Norenzayan and Gervais 2011), apparently on the basis of the questionable assumption that to offer reasons for the historical origins of religion amounts to an explanation of its contemporary utility or appeal.

Yet our concern in this paper focusses on the significant challenge to Wilson’s interpretation of the notion of “consilience” offered in 2003 by Gould. In what follows, I shall set out Gould’s concerns about Wilson’s approach to consilience, and explore how Gould’s own approach to this topic – which he considers to represent a retrieval and reappropriation of Whewell’s original idea – can be used to develop a viable working relationship between the natural sciences and the humanities in general, and religion in particular.

Gould’s Critique of Wilson

Gould’s critique of Wilson’s understanding and application of the notion of consilience has two main components. First, Gould demonstrates that Wilson misrepresents William Whewell’s concept of consilience, in effect repurposing it for his agenda of establishing scientific dominion over the humanities; second, he sets out significant critiques of some of its individual elements (Gould 2003, 205–15). Gould’s analysis leads him to conclude that Wilson has adapted Whewell’s ideas for his own purposes, suppressing those elements he finds inconvenient, and extending those he finds congenial to the point at which they become inconsistent with Whewell’s position. Gould’s close reading of Wilson’s *Consilience* indicates that Wilson has little interest in engaging Whewell, fails to appreciate Whewell’s significance as a philosopher of science in enabling Darwin to move from a mass of observations to a coherent theory, and appropriates Whewell’s term for his own ends.

For Gould, Whewell was concerned to understand “the process of induction, or movement from repeated observations to general conclusion” (Gould 2003, 207). He developed the concept of consilience in order to account for a “‘jumping together’ of disparate facts into a common structure of explanation” (Gould 2003, 209). Gould suggests that Darwin’s *Origin*

of Species represents “the most brilliant example ever constructed for the power and efficacy of consilience as a method of proof in natural history” (Gould 2003, 211). It enabled Darwin to make “coordinated sense” of a set of seemingly disparate observations.

Yet Whewell did not treat consilience as a method of *reduction*. Indeed, Whewell’s own analysis points to consilience being seen as *additive*. The phenomena are not denied or diminished; something is *added to them*, in order to explain them. “There is a New Element added to the combination [of instances] by the very act of thought by which they were combined” (Whewell 1847, vol. 2, 48). Whewell held that this “act of thought” was to be understood as a mental operation of bringing together a number of empirical facts by “superinducing” upon them a way of thinking which unites the facts. For Whewell, this renders them capable of being expressed by a general law, which both identifies and illuminates the “true bond of Unity by which the phenomena are held together” (Whewell 1847, vol. 2, 46). A similar point is made later in the nineteenth century by the American philosopher Charles S. Peirce, in a discussion of the nature of theoretical explanation which parallels Whewell’s reflections on deficiencies in Aristotle’s account of induction (Flórez 2014). For Peirce, a good theory “adds something to [observations] ... because the addition serves to render intelligible what without it, is unintelligible” (McKaughen 2008, 466).

Gould clearly sees that Whewell’s concern is not to diminish nature, but to enable a more effective human comprehension of its interconnections. Gould’s critique of reductionist accounts of scientific explanation, such as that he finds in Wilson’s *Consilience* (York and Clark 2005, 292–3), is partly grounded in his realization that explanation *adds* something to observations to render them intelligible and coherence. Perhaps more significantly, Gould rightly discerned that Whewell does not consider that the explanatory styles and strategies

deployed in the natural sciences can be extended into the humanities (Gould 2003, 215). Whewell, Gould argues, does not understand consilience in terms of “a single consilient chain” that can be applied to all disciplines, leading to the “unification of all knowledge along a single chain of rising complexity,” arguing instead for “irreducible different ways of knowing” (Gould 2003, 254). Where Whewell “regarded the humanities (particularly moral and religious reasoning) as a set of logically and inherently separate ways of knowing,” Gould points out that Wilson wants to subsume them within the “single reductionist chain” offered by the natural sciences (Gould 2003, 255).

Gould thus recognizes a multiplicity of valid research methods, adapted to their specific objects of interpretation and disciplinary fields of study, and rejects Wilson’s notion of evolutionary theory as a single research method that can be used universally. Wilson, in developing his point, insists that evolutionary theory is not merely a resource from which the humanities can benefit; it is a controlling paradigm by which they are to be understood. This is particularly clear in his remarkable preface to a collection of essays on what we might call “Darwinian Lit-Crit” (Wilson 2005; cf. Pinker 2007), which appeared too late to be considered by Gould, but nevertheless exhibits precisely the concerns he identified. Wilson here speaks of the “sciences and the humanities united”, while setting this bold affirmation in a context which clearly privileges the sciences.

Gould points out that Wilson appears to believe that speculative accounts of the origins of human moral values or artistic tastes confirms their present utility and validity:

Wilson makes a doubly false transition: first, from this speculative theory about *origins* to a claim about *current and continuing utility of the arts*; second, and more

serious, from a claim that the magisterium of science about the emotional utility of art to a definition of truth and beauty in the magisterium of ethics (Gould 2003, 241).

Although Gould makes this point with reference to aesthetic issues, it is part of his broader critique of Wilson, perhaps seen at its most effective in his faulting of Wilson's speculative argument for an objective scientific basis for ethics (Gould 2003, 241–6).

Gould notes that while a case can be made for the evolutionary origin of ethics, this issue is located on “an irrelevant periphery of the great moral debates in the history of scholarship and human life.” For Gould, science can help us with such “non-empirical questions about the meaning of existence and the definition of goodness,” without dislodging their primary location “within the logics and methods of the magisterium of the humanities” (Gould 2003, 246). Gould argues that Wilson, in pursuing his “reductive consilience,” ends up believing not merely that biological accounts may be offered for the *origins* of human ethics or the artistic sensibilities of humanity, but that these may tell us what these moral and aesthetic values *ought* to be.

Gould on the “Non-Overlapping Magisteria” of Science and Religion

What, then, is the implication of Gould's exposition of the notion of consilience for an understanding of the relationship of science and religion? To appreciate the importance of Gould's 2003 discussion of this issue, we first need to explore its earlier formulation. By 2000, Gould was well-known for his advocacy of the “Non-Overlapping Magisteria” of science and religion, which he describes as a “humane, sensible, and wonderfully workable solution to the great nonproblem of our times” (Gould 1999, 92). In 1999, Gould spoke of a “respectful noninterference” between science and religion, and at points framed the distinction between them in terms of the distinct realms of empirical facts (“how the heavens

go”) on the one hand, and meaning and morality (“how to go to heaven”) on the other (Gould 1999, 5–6).

Although Gould has been a vigorous defender of an evolutionary outlook in public debate (Sheldon 2014), he has offered little in the way of indicating how possible tensions between science and religion on this important point might be resolved, other than observing that, from his perspective, there could not be any meaningful conflict between them. Yet there are clearly some inconsistencies in the manner in which Gould engages the relation of science and religion. At this stage, however, Gould’s approach was more a way of demarcating intellectual territories than a conceptual proposal for resolving the tensions between science and religion, making no attempt to engage the methodological divergences between science and religion, or take account of the important distinction between “religion” and “theology” (Logsdon 2016). Yet, in fairness to Gould, this was not his intention; at this stage, his was an exercise in cultural cartography, designed to affirm the integrity of what he considered to be two quite distinct intellectual territories, and minimize the risk of cultural warfare or intellectual invasion. He did not wish to stifle conversations across intellectual disciplines, and in his own writings demonstrated a remarkable facility with cultural and intellectual history (York and Clark 2005).

Gould is alert to the distinct identity of various disciplines within the humanities, as we noted in considering his views on moral philosophy and aesthetics. Gould’s affirmation of the importance of religion partly reflects his high regard for the humanities as a whole, considered as a set of magisteria distinct from, and independent of, the natural sciences. It is essential to appreciate that Gould’s views on science and religion are framed by his broader understanding of the relation of the natural sciences and humanities. Yet Gould sees religion

as having a distinct identity and significance relating to its engagement with questions of meaning and values.

The lack of conflict between science and religion arises from a lack of overlap between their respective domains of professional expertise – science in the empirical constitution of the universe, and religion in the search for proper ethical values and the spiritual meaning of our lives (Gould 1998, 271).

Some theologians have suggested that this kind of approach is somewhat simplistic, and needed nuancing if it is to be intellectually credible or of real value in facilitating and informing dialogue between science and faith (Logsdon 2016, 530–4).

While every definition of religion – and its corresponding category of “non-religion” – is open to challenge (Jong 2015), Gould offers a definition of religion that has probably made his task more problematic than need have been the case. For Gould, religion designates “all moral discourse on principles that might activate the ideal of universal fellowship among people” (Gould 1999, 62). This understanding of religion is clearly inadequate, not least in that it does not correspond to what most people understand by religion – for example, as including belief in God. How, for example, could Gould’s definition cope with the case of the Cottingham Fairies of 1917, which generated a significant discussion about the scientific status of spiritualism (Branford 2011)? This, it must be conceded, represents a problem that Gould was ill equipped to meet.

Yet in 2003, Gould set out to model a “consilience of equal regard” that acknowledged the differences between, yet embraced the distinct character and values of, the multiple forms of knowledge that constitute human wisdom. Gould thus sought to demarcate the territorial identity and integrity of science and religion with the intention of encouraging dialogue and

discourse across disciplinary boundaries (Gould 2003, 259). He argues that the natural sciences and humanities are distinct, yet not for that reason incompatible, forms of human knowledge, and urges his readers to find ways of bringing them together. We shall explore and assess this later view in what follows.

Gould on a “Consilience of Equal Regard” between Science and Religion

As a result of his critical engagement with Wilson’s *Consilience*, Gould’s final reflections on the relation of science and religion focus more on the positive benefits of their dialogical interaction, rather than the essentially neutral or negative benefits accruing from their non-interference. While many have been critical of Gould’s earlier approach to the relation of science and religion (e.g., Karuvelil 2012), locating his views within the context of his understanding of Whewell’s concept of “consilience” allows them to be seen in a more considered and positive manner. This framework allows us to fill in some of the assumptions and strategies that lie behind Gould’s thinking on this question.

When viewed through the prism of Whewell’s concept of consilience, Gould can be seen not as arguing for the *isolation* of science and religion, but as insisting upon their *distinctiveness* in terms of their intellectual methods and cultural outcomes, as a prelude to meaningful conversations. For Whewell, we must “utilize the two domains to our maximal benefit when we recognize the different light that each can shine upon a common quest for deeper understanding of our lives and surroundings in all their complexity and variety” (Gould 2003, 251). For Gould, science and religion constitute distinct intellectual territories, but their boundaries are porous, encouraging dialogue and exploration. Where Wilson tends to think of science as a superpower exercising influence over smaller intellectual nations, Gould sees them as autonomous nations, engaged in dialogue and collaboration for their greater good

(Gould 2003, 155–7). Gould’s retrieval of Whewell’s concept of consilience is part of this broader strategy of avoiding both scientific over-reach into religious issues, as well as religious intrusion on scientific territory. This concern was evident in the 1990s, when it was generally framed in terms of the impossibility of contradiction between science and religion, when these are constrained within their proper territories.

In the course of developing his 2003 theme of a “Consilience of Equal Regard” between science and religion, Gould set this in the context of four broad concerns about how the relationship between science and religion should be construed which go beyond his concerns about disciplinary encroachment. First, Gould considered that, given the pervasive presence of religion within American culture, it was self-defeating for science to declare that religion was its enemy, despite vociferous voices insisting that this was the case. Second, Gould recalled his own youthful embrace of the myth of the “warfare of science and religion,” while noting that his own wider reading in the humanities now persuaded him that this was “a nineteenth-century invention” (Gould 2003, 85–95). Gould’s deep familiarity with the history of the natural sciences, particularly biology, which made him suspicious of the simplistic “warfare narrative,” has been the cause of much positive comment (Blaser 1999). The contrast with Richard Dawkins’s historically uninformed assessment of substantially the same issues is particularly striking (McGrath 2015, 144–55).

Third, Gould was concerned about how easy it was to lapse into absolute dichotomous thinking, in which commitment to one belief was held to be necessarily exclusive to other beliefs (Gould 2003, 69–112). Reflecting on the myth of the warfare of science and religion, he located the real problem in a refusal to accept the complexity of the issues, and to descend into ridicule rather than serious intellectual engagement.

I came to realize that most of the starkness and uncompromising opposition in all these episodes of defueling dichotomy arises not from any position actually taken by any party in the debate, but rather from the strawmen of extremity invented by one side to discredit the other and win the argument by ridicule (Gould 2003, 9).

Gould could see no valid reason why intelligent people should not hold a plurality of beliefs across disciplinary boundaries. Science and religion might not be in conflict, or be methodologically capable of contradiction; they could, however, certainly talk to each other. For Gould, it is natural that we should find ourselves engaging a plurality of ideas, reflecting the different intellectual methods by which these were secured (Gould 2003, 81–4). Gould’s case could now be strengthened by drawing on contemporary sociological analysis, which makes it clear that human beings regularly weave together a series of narratives and values, even though these might appear to diverge at points of importance. The sociologist Christian Smith, for example, has documented how we use multiple narratives to make sense of different aspects of our world, despite the fact that these narratives are often competitive and at points mutually exclusive (Smith 2009, 63–94).

This leads us into Gould’s fourth point, which is essential both to understanding his position in relation to science and religion, and to grasping how this fits into his larger intellectual vision. Acknowledging the importance of both the sciences and the humanities, Gould affirmed the value and potential productivity of interdisciplinary conversations: “what a power we could forge together if we could all pledge to honor both of our truly different and necessary ways, and then join them in full respect, in the service of a common goal” (Gould, 2003, 8; cf. Gould and Purcell 2000). Why should we not “enjoy the differences” between

these disciplines, while at the same time “find some meaningful order in the totality?” (Gould 2003, 190).

Throughout this 2003 discussion, Gould affirms both the reality and the intellectual necessity of differences between the sciences and humanities, while at the time insisting on their potential for synergy. Gould’s argument here parallels the growing recognition of the necessity and propriety of using different research methods for the investigation of different aspects of our world (McGrath 2019). Gould’s positive engagement with religion is to be located within his programmatic embrace of the humanities in general as an essential and appropriate extension of the human encounter with our world, and our capacity to make sense of it and live within it. The “legitimate magisterium of science” is not an *exclusive* magisterium that can be uncritically and consistently applied to everything – which is a core element of his criticism of Wilson’s notion of consilience.

Mary Midgley, one of the more significant recent philosophical critics of aggressive scientific reductionism (Kidd 2016), lends Gould some support in this enterprise, pointing out that science is not “an isolated monarchy,” but is rather “a republic, doing constant business with the other republics around it” (Midgley 2005, 195). Midgley’s critique of the *monarchia* of the natural sciences is a helpful way of challenging the over-reach of scientism, and a reminder that the natural sciences are part of a wider federal framework of human knowledge production – including matters of religion (McGrath 2020).

In her critique of Wilson’s *Consilience*, Midgley again emphasizes the necessity of discipline-specific research methods, and affirms the value of the ensuing plurality of

insights, which she considers that Wilson has signally failed to grasp in his pursuit of an idealized unification:

The painful truth is that there are lots of kinds of explanation. The thought patterns which we use in understanding language, or in doing mathematics, or in trying to grasp each other's motives, or in historical research, or in responding to works of art, are not just superficial layers of folk psychology laid over a single basic pattern prescribed by physical science. Instead, they are appropriate devices evolved for dealing with many quite different kinds of human situation, only one of which confronts science (Midgley 1998, 23).

Gould develops a similar line of argument, insisting on the recognition of a plurality of scientific and other insights. Consilience “arises from a patchwork of independent affirmations, not by subsumption under an imposed ensign of false union” (Gould 2003, 20). In making this penetrating criticism of Wilson’s unificatory imperialism, Gould offers us an attractive alternative intellectual vision of “quilting a diverse collection of separate patches into a beautiful and integrated coat of many colors” (Gould 2003, 15), even if he does not ultimately resolve how its components are initially to be *brought together*, and subsequently to be *held together*. His concern is to achieve a limited unification without reductive distortion.

Responding to Criticisms of Gould’s Approach

In the light of this analysis, it is difficult to see how the criticisms of Polkinghorne or Caiazza noted earlier in this paper can be fully sustained in relation to his later position (Polkinghorne 2005; Caiazza 2005). In fairness to both of these critics of Gould, I gladly concede that his works of the late 1990s are certainly open to such interpretations at points; the views set out

in those earlier works are, however, significantly qualified by Gould's extended analysis in *The Hedgehog, the Fox, and the Magister's Pox* (2003), which is not engaged by either Polkinghorne nor Caiazza. As the analysis set out in this article has made clear, Gould's final position is that science and religion need to maintain their *distinctiveness* and *integrity*, particularly in the face of the rapacious intellectual territorial claims of Wilson and others; they can, however, engage in meaningful and productive dialogue, leading to some degree of integration of their perspectives without loss of disciplinary integrity.

Polkinghorne expresses an entirely reasonable concern about the intellectual isolationism apparently entailed – and certainly implied – by Gould's original formulation of the NOMA principle during the late 1990s (Polkinghorne 2005). Yet Gould clearly opens the door to conversations and reflections across disciplinary boundaries in *The Hedgehog, the Fox, and the Magister's Pox*. Indeed, some might argue that Gould's own extensive interaction with history and the arts shows that such interdisciplinary instincts and interests are deeply embedded within his intellectual mindset (York and Clark, 2005), and were simply awaiting conceptual formalization.

A similar concern was expressed by Ursula Goodenough, who rightly observed that Gould's earlier approach struggled to cope with the realities of the engagement of science and religion. "If there is a membrane separating the magisteria of science and religion, it is decidedly semipermeable" (Goodenough 1999, 267). While Goodenough suggests that this permeability partially reflects some inconsistencies within Gould's analysis, it is clear that she, like Polkinghorne, is aware of the significance of the multiple conversations already taking place across such disciplinary barriers, to which she herself contributed around that time (Goodenough, 1998; Goodenough, 2001).

Caiazza's concern is that Gould's concept of "non-overlapping magisteria" which are incapable of contradicting each other seems to represent an inappropriate intellectual regression to Siger of Brabant's unsatisfactory idea of a "double truth" (Caiazza 2005, 11–12). While there is merit in this concern, irrespective of whether Siger of Brabant actually took this position, Gould's later formulation of his position helps clarify the point at issue. What Gould has recognized, in common with many other interdisciplinary scholars, is that such attempts to work across disciplines leads to a plurality of partial truths, which require integration.

In this paper, I have already cited the leading British public philosopher Mary Midgley, who is certainly no proponent of a "double truth". Yet she makes precisely the point with which Gould is concerned in her final book, *What is Philosophy for?*

On the one hand, I want to emphasize that there really *is* only one world, but also – on the other – that this world is so complex, so various that we need dozens of distinct thought-patterns to understand it. We can't reduce all these ways of thinking to any single model. Instead, we have to use all our philosophical tools to bring these distinct kinds of thought together (Midgley 2018, 193).

Midgley's point is that multiple disciplines – such as science and religion – yield an unintegrated plurality of perspectives on reality. It is the task of philosophy, in her view, to find a means for the integration of these partial insights. These insights may indeed appear to be incompatible at times; this, I take it, is Caiazza's concern. Yet as the philosopher Alexander Rueger notes, these difficulties need to be resolved at the level of the "Unified Theory" itself. "What might look like incompatible assumptions with respect to the whole

system may turn out to be perfectly in harmony if assigned to separate, exclusive regions rather than to the system as a whole” (Rueger 2005, 580). I share Caiazza’s rejection of the notion of double truth; the field of science and religion, however, arguably involves attempting to *correlate*, and where possible to *integrate*, a complex set of partial truths.

Perhaps this is where Gould’s approach requires further development. The attractive intellectual agenda of “quilting a diverse collection of separate patches into a beautiful and integrated coat of many colors” (Gould 2003, 15) requires reflection on what framework might be used to lend theoretical substance to the vision that Gould presents in essentially aspirational terms. What theoretical threads – to use an image originally deployed by Whewell – might be used to hold these patches together in a coherent whole? How might this take account of the concerns of those such as Nancy Cartwright, who propose localized disciplinary pockets of knowledge (Cartwright 1999)? While such challenges can certainly be engaged (Anderson 2001; McGrath 2019, 204–26), it is significant that even Mary Midgley, one of the most significant advocates of such an approach, failed to develop such a theoretical framework (McGrath 2020, 854), even if she offered some imaginatively helpful means of envisaging such correlations.

Conclusion

Gould is often presented as a representative of an approach to science and religion which emphasizes their independence, and hence their disconnectedness, thus isolating them from meaningful interaction or dialogue. This paper has sought to bring out the intellectual depth of Gould’s 2003 position on this matter as a matter of importance in itself, highlighting the importance of his engagement with intellectual history, while pointing to his potential contribution to the kind of interdisciplinary dialogue that lies at the heart of the field of

science and religion. Gould's bold statement of the relation of science and the humanities sets his views on science and religion in their proper context:

I too seek a consilience, a "jumping together" of science and the humanities into far greater and more fruitful contact and coherence – but a *consilience of equal regard* that respects the inherent differences, acknowledges the comparable but distinct worthiness, understands the absolute necessity of both domains to any life deemed intellectually and spiritually "full," and seeks to emphasize and nurture the numerous regions of actual overlap and common concern (Gould 2003, 259).

It seems that Gould's anxiety at Wilson's flawed account of consilience led him to expand his earlier understanding of the relation of science and religion, allowing both that there are "numerous regions of actual overlap," and actively encouraging their exploration and nurture.

Far from placing some kind of embargo on intellectual traffic between these disciplines, Gould is concerned to maintain their integrity and autonomy in the face of Wilson's approach in *Consilience*. Gould recaptures something of the scope and breadth of Whewell's original vision, in which we are called on to "recognize the different light" that science and religion "each can shine upon a common quest for deeper understanding of our lives and surroundings in all their complexity and variety" (Gould 2003, 251). He offers us an (admittedly underdeveloped) intellectual framework for an informed and productive conversation between science and religion, two of the most prominent patches of Gould's "beautiful and integrated coat." Perhaps we need to draw on others to help solidify and consolidate their interaction and the integration of their outcomes; yet Gould surely lays a foundation on which we may build further.

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