**Born in the *WR:***

**THE DEVELOPMENT of THOMAS HUXLEY’S VIEWS on SCIENCE and RELIGION in the *WESTMINSTER REVIEW* 1854-1860**

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Department of Science and Technology Studies

York University

Toronto, Ontario, Canada

***Supervisor: Prof. B. Lightman F.R.S.C.***

W.I. Atkinson

YU 211359007

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**Abstract.** Scholarship on the public writings of T.H. Huxley has concentrated on his time as a public figure c.1860-95. This paper presents and examines Huxley’s earlier views (particularly on science and religion) as developed in the *Westminster Review* 1854-60.

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**Note on Source Abbreviations:**

 **LH**: Leonard Huxley, *Life and Letters of Thomas Henry Huxley* Vol.1 (1900)

 **AD**: Adrian Desmond, *Huxley: The Devil’s Disciple* Vol.1 (1994)

 ***WR***: *Westminster Review* ed. John Chapman 1854-60 (London UK)

**I / THESIS & FOREWORD**

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his paper studies a key but underexamined source of the influential output of letters, lectures, and popularizations that fountained forth from Thomas Huxley 1860-1895: that is, Hal’s1 early writings in the *Westminster Review* 1854-60. It is here that he forged his life’s approach to descriptive thought and prescriptive action, particularly *in re* the science/religion debate.

 An axiom of Hal and his allies was that “nothing will come of nothing”2. As Hal’s lifelong ally John Tyndall expressed it in a popular science text, “Every occurrence in Nature is preceded by other occurrences which are its causes, and succeeded by others which are its effects.”3 That axiom forbids events without demonstrable natural origins, *viz*. miracles. As well as strict causality Huxley, Tyndall *et al.* insisted on verifiable laboratory evidence, and construed ‘religion’ as a supra-logical awe distinct from formal theology.4 This set of contentions constitutes the agnostic gospel through which Huxley and his acolytes would transform British science; the midcentury *Westminster Review (WR)* shows how that process was begun.

For example, the 14,000-word *Origin of Species* review that appeared on pp 541-570 in the 1860 April edition of the liberal quarterly(*WR* 17-2) was anonymous; yet scientific London knew that the reviewer was a 34-year-old biologist named T.H. Huxley, elected to the Royal Society in 1851, given its Gold Medal in 1852, and a contributor to the *WR* since early 1854.

**II / THE *WR***

To the autumn of 1853, Hal Huxley’s life had comprised twenty-eight straight *anni horribiles*. He had apprenticed in disciplines for which he had little interest; pursued biological research aboard a roach-infested tub in the Antipodes5; and after half a decade returned to a homeland whose idea of science was mired in theology, tainted by patronage, and miserably underfunded to boot. By 1853 Hal had been discharged as an assistant naval surgeon and First Lieutenant, and was rooming with relatives while eking out a living through hack writing. Being showered with accolades for his earlier work on invertebrate morphology was all very well; disinterested praise had been the reward for British men of science6 since Boyle and Hooke. But such accolades presupposed that science was undertaken by wealthy gentlemen, and Hal was not of that class. Instead he must scrounge out £600 *p.a*. to marry his fiancée Henrietta, and establish himself in society.

It was an uphill fight; a man without Hal’s dazzling intelligence and jaw-dropping work ethic might have despaired. Yet what should have been Hal’s job trap, *viz.* writing throughout the 1850s for the *Westminster Review* at fifteen shillings per printed page7, he turned into an occasion for advancement*.* Even after attaining a meagre but steady income by succeeding to Edward Forbes’s London professorships, his friend and mentor having decamped to the University of Edinburgh, Hal did not abandon his piecework reviewing. As a result we have a fascinating record of the development of young Huxley’s views in his formative, pre-fame period 1854-60 – not just on science but on philosophy, theology, religion, and contemporary literature, but also (and equally importantly) their relationships to one another, and to society as a whole.

The *Westminster* had been founded by the English utilitarian philosopher Jeremy Bentham in 1823. The new periodical used the third embodiment of the *Edinburgh Review* as its model, but in tone and content positioned itself as the *Edinburgh’s* radical-leftist opponent. Both periodicals were quarterlies whose publisher determined editorial position; in both, contributors summarized, compared, and assessed current books felt to be of interest to the review’s target audience. The *WR* aimed at educated upper-middle-class intellectuals with a classical education and a reformist bent8, and like the *Edinburgh* its writers were anonymous. While modern historians have outed the authors of many articles in both *WR* and the *Edinburgh*9, for both periodicals anonymity encouraged writers to express themselves freely10.

Hal’s recruiting publisher was John Chapman, who in 1851-2 had staked his fortune to buy and revivify a moribund *WR.* As well as Huxley, Chapman enrolled Mary Ann Evans, who as ‘George Eliot’ would write some of the 19th century’s greatest novels; John Stuart Mill, son of *WR* co-founder James Mill; and G.H. Lewes, a writer almost as Germanophilic as Huxley.11 Under Chapman, the *WR* generally functioned as the common voice of a progressive, like-minded collective. Through it Hal as a young but ambitious unknown made his first forays out of highly structured learned discourse circulated among a tiny audience (*i.e.* scientific papers) into the vastly wider realm of public debate. He led off in the January 1854 issue with a review of his erstwhile colleague Jock MacGillivray’s account of the HMS *Rattlesnake* voyage, Hal coyly quoting his own shipboard diaries as “a letter selected from our own correspondence.”12

In a sense the adolescent Huxley was already preparing for *WR*. In 1900 his son Leonard, five years after the death of his father, published *Life and Letters of Thomas Henry Huxley*. While Leonard’s two volumes constitute “a labour of love amounting to hero-worship”13, the editor-son’s portrait seems not unduly distorted.One of LH’s first citations is a private journal entry made by a 14-year-old Hal in 1840:

Let us suppose then that an Eon – a something with no quality but that of existence – this Eon endued with all the intelligence, mental qualities, and that in the highest degree – is God . . . At the creation we may suppose that a portion of the Eon was separated from the intelligence, and it was ordained – it became a natural law – that it [*viz*. the Creation] should have the properties of gravitation, *etc*. – that is, it should give to man the ideas of those properties. The Eon in this state is matter in the abstract. Matter, then, is Eon in the simplest form in which it possesses qualities appreciable by the senses.**14**

 Deep thoughts for a teenager! Yet Hal held commensurate views for his remaining 55 years. Not only was he steadfast in his assertion that only men of science6 such as himself should have final say on scientific matters; *every* field, he maintained, must support its statements with empirical proof that is reproducible at will by expert practitioners. Even humanistic disciplines such as theology must strive to be scientific; the alternative was for them to descend into mumbo-jumbo.

Hal’s empiricism runs through his *WR* science articles like an endoskeleton, linking such disparate disciplines as physics, biology, geology, and astronomy into a coherent but wide-ranging whole. Writing in the *WR,* Huxley addressed the great scientific issues of his day. Among them were theoretical explanations for changes in biomorphology, as well as possible mechanisms for the emergence of new species (setting the stage for *Origin of Species* in 1859); attribution of both the Irish potato blight and European vine disease not to “atmospheric changes or subterranean exhalations” but to fungal microorganisms, an insight anticipating Pasteur; and a laudatory review of Darwin’s meticulous work on barnacles, another *Origin* precursor.

In 1860 April, Hal’s 30-page *WR* piece reviewed Charles Darwin’s theoretical reimagining of species origin. This time Huxley’s cover was blown; it was common knowledge among the *cognoscenti* that no one but Hal could have written this review, one as brilliant, eloquent, and empirically justified as the work it assessed. *L’enfant terrible* Hal here attains his authorial apex in the *WR*, saluting his friend’s achievement but wisely cautioning his readers that natural selection was still but a theory. In a later, Popperian sense it is a falsifiable hypothesis, whatever its empirical power as a near-term explanandum15. Science, Hal saw and said, is eternally contingent.

**III / NON-SCIENTIFIC *WR* ARTICLES: A LIMITED WAR**

In general, Huxley holds his *WR* scientific pieces to clear issues of scientific naturalism. Paradoxically, it is in his *non-*scientific articles that Hal most vigorously lays out his prescriptive concept of how science and religious belief might most profitably interrelate. Thus Hal discourses on *Theology, Philosophy, and Politics* in 1854 July; *Theology* alone in 1855 April; *Theology and Philosophy* in 1855 October and 1856 January. In these supposedly non-scientific articles Hal set out his deepest arguments on religion, science, society, and theology – the latter a category that he always held to be distinct from religion16. It is in the 1854 *WR* that Hal launches his lifelong campaign of championing science over alternative world views. He assesses recent theological books for Britain’s progressives, emphasizing works by Germany’s ‘learned class’ among whom

[s]criptural studies retain their value and repute; pursued, however, far less than with us [*i.e.* the British], in the interest and under the prejudgment of dogma, and more with the simple desire to recover on any terms the true picture of the past. Partisanship, no doubt, there is . . . but it must, at least, use the weapons of erudition and the critical intellect.**17**

 As an Anglophone conversant with spoken and written German Hal was in a privileged position *vis-à-vis* most of his countrymen. Not surprisingly, he uses his linguistic advantage to attack and deconstruct Holy Writ (as well as the British propensity for trite natural theology) along Germanic lines, and ridicules theology and its ‘gnosticisms’**18** as presumptuously dictating His properties and proclivities to Almighty God. For Hal, buoyed by a *Deutscheliebischen* scholarship inaccessible to unilingual critics**19**, theology is a *human* enterprise: whoever describes God and His laws and demands must back up his arguments with hard data. Hal’s is a scientificapproach.

 For Hal, religion did not interact with science only; it also affected politics. In the second *WR* issue to which he contributed (1854 April, 61-120) Hal in Article VI draws a parallel between Russia and England, whose Anglican élite held national politics and science in a near-stranglehold20. In praising the guerilla campaigns of the ‘Prophet-Warrior Schamyl’ against “the flax-haired Christian dogs” of “infidel Muscovy” (Schamyl’s words), Huxley contrasted

the grovelling idolatry of the Greco-Russian church . . . [with] the moral of Schamyl’s history, showing as it does what youthful vigour there yet is in Islam, and how much nobler is the nationality of the free Caucasian than that of the slavish Russ.**21**

Hal does more here than reflect the anti-Russian sentiment in Britain, which with France had declared war on Russia a week before (1854 March 28). In his *WR* articles he gave vent to the opinion, acquired in adolescence and reinforced during and immediately after his time aboard *HMS* *Rattlesnake*, that his homeland saw science not as a remunerative profession but as the pastime of gentlemen dilettantes22. To Huxley the essential struggle was between not science and religion but rather science and *established* religion, with the latter’s stress on strict theology23. All Hal’s life he would maintain this approach. If this be a conflict hypothesis, it is a limited war: Hal never exhibited a problem with religion or religious emotion *per se* **60**.

**IV / NON-SCIENTIFIC *WR* ARTICLES: CLOSE READINGS**

***WR* 62-121 (1854 July).** As the Crimean War gets underway, Huxley laments war’s harsh effects on the free flow of scientific information across international borders: “The storm that gathers over Europe announces its approach by the gradual spread of silence over the more tranquil forms of speech and thought”24. It is a nicely worded statement of the international freemasonry of science in which Huxley believes25. To combat a militaristic restriction of free scholarly co-operation across borders, Hal (as usual) extols Germany’s tradition of historico-philological Scriptural criticism and presents as exemplars five German books that, taken together, deconstruct Holy Writ and obviate its literalist interpretation. Huxley pens no panegyric: the books he assesses come in for sharp correction, especially Lekebusch; but Hal saves his real vitriol for his fellow Anglophones. “We are not aware,” he writes, “of any Continental theology . . . that can be compared with the typical and prophetic literature that disgraces England and America.”26 The American author C.H. Putnam, for example, he pillories as “deal[ing] with the Scriptures as a shapeless lump of possibilities, from which he may carve the idols of his thought.”27

This is not an isolated dismissal. Throughout his *WR* scientific and non-scientific articles, Hal has no compassion for what he considers pseudo-science. He has no scholarly sympathy for thought which, however problematic its correspondences with objective reality, enlists both proselytes and converts. In these *WR* articles Huxley takes no prisoners: he lashes anyone he sees as a scientific fraud, fool, or ‘scientaster.’ Here is his take on the spiritualism then oozing out of America:

If it were true that our poor souls, after retiring into their rest after the weary fight of this world, were to be at the beck and call of every tobacco-squirting “loafer” who chose to constitute himself a medium, would not those of us who have any self-respect sooner become dogs, and perish with our bodies? 28

 Note the tropes that modern analysts call ‘dog whistles’: *viz.* slights slyly conveyed in social code. ‘Tobacco-squirting’ invokes a long-held slur against rude colonials; ‘perish with our bodies’ is a nod to the orthodox Christian theological position that of all living species only *H.sapiens* has an immortal soul**29**. Hal’s iconoclasm stops short of radical materialism, for all such atheistic leanings would threaten the rising social status of the new *paterfamilias*. And for someone who purports to contemn ideological nit-picking, Hal exhibits a decided talent for it, noting for example that ‘the Hegelian forms of thought are too much forced back on anterior philosophies’30.

Nonetheless Huxley’s *WR* texts are no Philippics; he remains scrupulously fair. Another Teutonic volume, ‘written by some unknown priest . . . in the fourteenth century’, is recommended as ‘a delightful little volume’ whose meditations are ‘carried out with exceeding depth and beauty into a number of just applications.’31 This encomium is perhaps evoked by Hal’s respect and affection for the author of the book’s preface, the Anglican broad churchman and social reformer Charles Kingsley. Naturally Hal cannot resist tweaking his dog-collared friend, suggesting in the *WR* that in presenting God as ‘the substance of all things’, Kingsley upholds ‘an ontological substratum to its [*i.e.* the universe’s] manifested phenomena’, and thus ‘is a pantheist.’ 32

***WR* 63-124 (1855 April).** Huxley delves so far into theological minutiae in this text that he seems a priest *manqué*.33. The pinheads where his angels dance – again in the Germanic tradition of historical philology that he so admires – include such distinctions as those between the Hebrew ‘is it not? (**תלא**)’ and ‘behold! (**ה:ה**).’ Huxley never shrinks from strutting his erudition; no discipline lies outside his scholarship. The truly scientific mind, he implies, encompasses all.34

For example: the Book of Jashar, a lost ‘record of the righteous’ inferred from KJV Joshua x.13 and 2 Samuel i.18 but outside the canon even of such Apocryphal books as Esdras and the Book of Thomas, ‘is generally supposed . . . [to have] perished, with the exception of the two passages referred to.’34 Yet Hal does not shrink from addressing such issues. He then takes on the topic (still contentious today) of psychology *vs.* theology, and concludes that most contemporary theology constitutes ‘an undertaking to breathe life into the dry bones of the Nicene formulary of A.D. 325.’ **35** Hal then demolishes the contention that God, the First Cause of Creation, has ‘will and consciousness.’ Religious tradition, says Hal, is a product of the communal not the supernal: actions which at first “issue from motivated [human] will, tend . . . to become spontaneous.’ In religious belief, as in every other *human* activity, routine use becomes second nature, and is subsequently accepted by believers as divinely ordained36. As for the synoptic gospel of that ‘dear and glorious physician’ Luke, Hal maintains that the author “is either an eye-witness or is falsely impersonating one . . . [Christ’s] resuscitation, and that of Lazarus . . . [one] imagines to have been recoveries from a state of *apparent* death.”37 Hal’s position is clear: The universe’s physical laws are so adamant throughout unending time and space that no exceptions in the form of miracles may ever occur. Apparent miracles are mere illusions38.

***WR* 64-126 (1855 October).** Hal opens with a screed against the Burnett Prize, funded by the devout Scots merchant John Burnett (1729-84). Its second claimant, the Etonian-Cantabrigian J.B. Sumner, later became the Archbishop of Canterbury39. The competition elicited “essays in proof of the existence of a supreme Creator, upon grounds both of reason and [of] revelation”40. The prize was a rich one: £1800, then the annual fee of an established surgeon or barrister.

Hal tosses an epithet (“amiable”) to the essay’s founder before taking off his gloves. The project “has encouraged the beating of old tracks, and has confined the thoughts of competitors to grooves of argument now well nigh worn-out.”41 Further, the essay’s mandate, though it “engages many powerful minds of the present day, was loosely conceived, and the wording founded, not upon a philosophical, but upon a stereodox [*i.e.* moribund] theology.”41 Having so prepared his canvas, Hal paints on it *The Immolation of R.A. Thompson* – the Burnett’s latest recipient. Thompson’s essay is “ill-considered, dogmatic, and traditionary [*sic*] . . . Much of the book was written before he [Thompson] had seen notice of this competition.” 42 Hal then dusts off an Epicurean koan from twenty-two centuries ago: If an omnipotent and all-wise Deity “knows what He is doing, and has unlimited resources, why are things no better than they are?”42 Thompson fails to make his case because a Final Source, an Uncaused Cause, is absurd *ipso facto* -

[A]n infinite chain [of causality] is not merely incomprehensible, it is impossible . . . If God exists, He exists necessarily; but He *does* exist, therefore He exists necessarily43.

Hence a contradiction, QED. I note that while Hal correctly dismisses this commonplace Christian dogma as begging the question, he falls into an identical trap: as stated by Tyndall *supra*, the cause-and-effect chain of scientific naturalism is also infinite and unbounded. Nonetheless Hal concludes that Thompson’s proof

is good [only] for the development of an attribute, property, or quality; not of the *existence* or reality of the subject to which the attributes [*&c.*] belong . . . Whether ‘that which moves’ [*i.e.* actively, not in the ergative sense of ‘being moved’; the *primum mobile*] is a *conscious* Being is the pivot-question in the whole enquiry”44

In other words: Before you drape your deity in theological garlands, first ensure that He exists; And if existing, is aware; And if aware, has concrete power; And if powerful, chooses to act; And if acting, acts for good*.* Hal argues that none of the foregoing statements is a given.

Yet Hal does more in this *WR* essay than exhibit his theologico-philosophical skills to the detriment of amateur theologians whose intelligence and acumen (and whose access to Teutonic scholarship) are inferior to his. If Hal spurns miracles scientifically, he admits their social role for the faithful: “though they are not historically true, they are true there and then to those . . . in whom they vivify a true idea.” Scientifically, this amounts to telling lies to strengthen faith; but Hal is willing to wink at this as doing no harm.

Overall, Huxley takes every road he can to reconcile Christianity’s warring sects, yet does not let believing authors off the epistemic hook. A work by Oxonian J.B. Mozley, for example, is savaged: “We feel that Mr Mozley’s work is incomplete, until he has further explained, *by way of a mystery*, how some infants are exempted from baptismal regeneration from the mass of [those predestined to] perdition, and some for want of it left to raise their piteous voices from an everlasting hell, with the cry, ‘Who slew all these?’”45

***WR* 65-127 (1856 January).** With this non-scientific article, Hal marks his second anniversary as a *WR* contributor. By now he consistently demonstrates a coolly magisterial oversight resting solidly on acumen, eminence, and authority: in authorial terms, he has become a great man.

Which makes him no less savage. If Hal took no prisoners before, here he hangs them publicly. Those who retail Christian orthodoxy are *ipso facto* in contradiction, and commonly accepted religious beliefs are a reductio ad absurdum – even if, *à la* Schamyl, one acknowledge their political benefit. In *WR* 65-127 and elsewhere Hal in fact does what he accuses the Sophists of doing: engaging in debate neither to reveal truth nor to root out untruth, ‘but only to shine’ – that is, defeat their opponents by brilliance of debate. Hal certainly shines here, at some risk to his moral fulcrum: when reading this article, one seeks in vain for mercy as well as justice.

Hal begins his text by engaging in what a half-century later Russell would call linguistic analysis, dissecting a word (‘logos’, λόϒος) into all possible shades of meaning. Hal then parses the most famous sentence in the New Testament: ‘In the beginning was the *logos*, and the *logos* was with God, and the *logos* was God’ (John 1:1). KJV translates *logos* as ‘word’, which is valid under most circumstances (*cf*. ‘logorrhea’). But ‘logos’ can also mean ‘study’ or ‘discipline’: hence ‘geology’ or ‘biology.’ In 65-127 *WR*, Hal goes further and proposes that the translation of *logos* most illuminating to Scriptural studies may be ‘reason.’ In saying so he implies that logical process – and by implication, analytic self-awareness – both proceeds *from* and is an intrinsic quality *of*, the Increate.46 As the article continues Huxley does not content himself with assessing his authors and their books: he limns for them the texts they *should* have written, but were too incompetent to write. No arcana are too obscure for Hal, no languages too esoteric: he glides like an apex predator through English, French, German, Latin, classical and New Testament Greek, classical Aramaic, and ancient Hebrew. German textual criticism is employed, so that not only individual words but even *Hebraic accent-marks* (!) are subjected to the same excruciating examination as ‘logos’:

with the introduction of the aspirate (‘) for ה and the lenis (’) for א and ע; we do not think that the latter mark should be made to represent two distinct elements, and that it would be a slight improvement on the Hebrew-English alphabet employed, to express ע by *anuswara*, or by a simple dot.47

Years after the *Rattlesnake*, it appears, Huxley is at his old specialty of microscopic dissection. He concludes his article with 2500 trenchant words on Herbert Spencer’s *Principles of Psychology.* Scholars who place Hal’s break with Spencer later in the 19th century, as supposedly triggered by Huxley’s disillusionment with Spencer’s extreme *laissez-faire*, should scan this article. Hal here declares that if

there are worn certain grooves, in which of necessity such and such conceptions must flow, then [Spencerian] Realism has no basis on which to support itself.48

Hal also attacks Spencer’s views on biodevelopment:

[T]he existence of any living being . . . presupposes an environment suitable for it, and if the environment lose its special conditions, the beings proper to it perish. But we are [*i.e.* Spencer is] not justified in inferring that there is any power in any mass of matter to generate beings capable thereafter of living in it.*.*49

So close to, yet far from, the *Origin* three years later! But thereby hangs a tale.

***WR* 17-2 (1860 April)**

*We shall not cease from exploration
And the end of all our exploring
Will be to arrive where we started
And know the place for the first time.50*

 I return now to my start point: Huxley’s 1860 review of *Origin of Species*51, an assessment by a first-rank scientist that correctly sees Darwin’s book as a revolutionary manifesto. Hal leads with a high-speed summary of the trouble that the *Origin* has caused: “old ladies, of both sexes52, consider it a decidedly dangerous book.”53 Hal counters with an *argumentum pro hominem*, citing Darwin’s credentials52, 53 : the *Origin*, he says, “inaugurates a new epoch in natural history.”52

In support of Darwin Huxley cites Richard Owen (an Establishment patron soon to become an enemy) on the definition of species, a construct then rapidly evolving:

[F]ew naturalists . . . use that term [‘species’] to signify what was meant by it twenty or thirty years ago, that is, an originally distinct creation . . . The proposer of the new [concept of] species now intends to state no more than he actually knows; as for example . . . that the species is wild54.

Owen’s term ‘originally distinct creation’ would lead indirectly to a permanent Owen-Hal and Owen-Darwin rift. Owen may have been the 19th century’s last influential believer in natural theology, which traces all natural species and behavior back to a Creator. Huxley covers the conundrum of embryology, though like Darwin he misses the vital importance of mutation in generating the continual variation that gives natural selection its smørgasbørd of genomic choices. “Varieties [*i.e.* new races and species] then arise we know not why,” Hal says.55 This was perceptive on his part, given that Mendel’s laws of heredity would not be generally known for another two generations56.

Huxley then flirts with the Lamarck-Lysenko hypothesis (intergenerational transfer of acquired characteristics, a heresy rehabilitated in our own day via gene methylation). He reaffirms that *H.sapiens* is one species among many, and thus wholly subject to the same scientific laws that govern all nature. This brings Hal to his main conclusion, *viz*. that most of his age’s religious thought lags so far behind science that the theology promulgated by the C of E is still in essence the folklore of preliterate goat herders. In fact the ideas

current among the rude inhabitants of Palestine . . . even at this day, are regarded by nine-tenths of the civilized world as the authoritative standard of fact and the criterion of the justice of scientific conclusions57.

 This is not to say that Huxley extols every aspect of Darwin’s book. He is not yet a convert:

Is it satisfactorily proved, in fact, that species may be originated by selection? . . . [S]o long as the evidence at present adduced falls short of enforcing that affirmation, so long, to our minds, must the new doctrine be content to remain . . . an extremely valuable, and in the highest degree probable, doctrine, indeed the only extant hypothesis which is worth anything in a scientific point of view; but *still a hypothesis*. 58

 Hal’s caveats remain valid today, as does his final judgement: “[Y]ears hence naturalists may be in a position to say whether this [hypothesis] is, or is not, the case; but in either event they will owe the author of ‘The Origin of Species’ an immense debt of gratitude.” **59, 15** One and a half centuries later, this still strikes one as shrewdly observed.

**V / SUMMARY AND CONCLUSIONS**

The anonymous writings of T.H. Huxley in the *Westminster Review* show a strikingly original style, and illuminate the thoughts of a young man on the brink of fame. This is particularly true when Hal’s non-scientific texts examine books, events, and ideas that converge on that well-trodden ground (too often a battlefield) where religion and science meet.

There is a chronological development in these articles, from broad generalization (1854) to detailed theologico-linguistic scholarship (1856). Yet the evolution of Hal’s thought in the 1850s seems less telling than his thought’s consistency. He construed the cosmos at age thirty-five largely as he had at fourteen: as a terrible, beautiful, and ultimately mysterious place that must be approached with curiosity and reverent wonder. The best way to do this, Hal maintains, is through science and the scientific method: apprehending nature with minimum preconceptions, accepting what one perceives, attempting to understand the generalities that underlie and explain the infinite specifics, and shunning authority-dictated doctrines that are not merely unprovable, but provably wrong. Hal’s espousal of the scientific approach explains the vigor of his critical writings, which at times go past brutal cruelty to real malice. Hal cannot bear fools gladly, even when they are (like Lewes and Owen) only part-time fools, and professional colleagues as well.

So much for Huxley’s justice; but Hal shows mercy too. He catches even his beloved German Biblical analysts in errors (*e.g.* Lekebusch in *WR* 63-124) and praises to the literal skies a comment by an author he has just savaged (*WR* 61-119):

 [I]f astronomy must destroy theology, it will not destroy, it will deepen religion. There is no man in whom the starry heavens have not excited religious emotion . . . However various the dialects and formulas into which the emotion may be translated, according to the various intellects of men, the emotion itself is constant; and the last man gazing upward at the stars will, in the depths of his reverent soul, echo the Psalmist’s burst: ‘The heavens declare the glory of God!’60

Thus Huxley publishes the personal and professional credo that would last him all his life. That he does so not in his own words but those of Lewes, a writer whom he has just bloodied with his critical lash, is not to be marveled at. For all his shortcomings as a scientist, Lewes here has uttered a great truth; one need not be Athanasius to accept the Athanasian Creed.

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**NOTES**

1. One of THH’s sobriquets, along with Pater (pron. *patter*) to his children, and Tom to his parents and siblings. *See* AD *passim*.

2. Shakespeare, W., *King Lear* I.i.

3. Tyndall, J., as cited in (among other places) *The Ontario Readers - Fourth Book 1909* pp 262-269, ‘Clouds, Rains, and Rivers’

4. Judged by their own criteria, Hal and his fellows seem to have been highly religious men; for details *see* p.13 above

5. HMS *Rattlesnake*, a ‘donkey frigate’ that leaked like a sieve and was full of vermin.

6. A phrase that Huxley always preferred to what he regarded as the *infra dignitate* neologism ‘scientist.’

7. AD p.185. It is indicative of Hal’s precariousness in 1854 that he boasted of Chapman’s *largesse* to fiancée Nettie.

8. For a detailed discussion of the interaction of content and audience in scientific and periscientific text see Atkinson, W., *Talking Down: Audience Construction in Recent Scientific Popularization* (2012). On Ac (Academics) button, website *williamatkinson.com*

9. I have taken as canon the most current attributions in the *Wellesley Index of Victorian Periodicals* (2016 August)

10. Freedom of the press as we currently understand it was still being negotiated in 1850s England: even truth-tellers might be successfully sued for damages. The ‘modern instance’ then was: *Libel is libel, whether true or false*.

11. Fifteen of the 27 works reviewed by Huxley in a typical nonscientific *WR* foray (1854 July, category ‘Theology, Philosophy, and Politics’) are in untranslated German, which Hal synopsizes in translation, and then discusses in his capacity as an autodidact Deutschophone. Of the twelve volumes that Hal reviews in this piece, four are either English translations from the German or else are by German authors only; thus 70 percent of Huxley’s universe of discourse in this article*, i.e.* 19 of 27 works, is Germanic. (Sample: Lekebusch, E., *Die* *Composition und Entstehung der Apostelgeschichte von Neuem unersucht*. Gotha: Friedrich und Andreas Perthes, 1854). It will come as no surprise that Huxley, in letters to his Continental colleagues during the ten-month Franco-Prussian War, lustily cheered his fellow scientific Teutons against the ‘decadent French’ – whose language he also had mastered. *See* Footnote 19

12. *WR* 1854 January, article ‘Science at Sea’ (61-119 p.105)

13. B. Lightman, private [oral] communication, 2016 August 12 (York University, Toronto)

14. LH p.10. For Hal’s mild later amendment of his early supposition *see* above *passim*

15. Today’s self-appointed champions of Darwin, *e.g.* Richard Dawkins, would do well to remember that bad things happen when acolytes become more dogmatic than their prophets. Marx famously declared that he was “no Marxist.”

16. *See* Hal’s quotation of Lewes in his Comte article, *WR* 1854 January p.257 (quoted in part on p.13 above). In his *WR* pieces Hal considers the ways in which cultural vectors other than science itselfmay interact to keep society’s powerful social and technical forces in stable equilibrium; this despite a note to Tyndall in 1854 October asserting that “I neither will, nor can, go on writing about books in other [*i.e.* non-scientific] departments, of which I am not competent to form a judgement even if I had the time to give to them.” Compare LH p.85 footnote 1 and *see* p.13 above (Lewes quotation)

17. *WR* 1854 July p.2 (*WR* p.223)

18. And opposition to ‘gnosticism’ is of course ‘agnosticism’!

19. Of the seven publications Hal synopsizes and reviews in this article, five are in untranslated German. As usual, Hal is taking pains to introduce his British readers (most of them unilingual Anglophones) to Continental scholarship – displaying thereby his mastery of that language and all its scholarship. *See* Lightman, B., ‘Scientific Naturalists and their Language Games’: in *History of Science* Vol. 53 (4), 395-416 (2015). For a fictional recreation of the contemporary Caucasus situation that combines sound scholarship with literary affect, *see* Fraser, G., *Flashman at the Charge* (in Bibliography)

20. In the mid-1850s the Church of England inextricably intertwined the secular with the profane, to the point that the C of E was whimsically but accurately called ‘The Tory Party at Prayer.’ As Hal suspected, the common currency among the Church’s theologians, officials, and lay membership was power – political, cultural, and (above all) economic.

21. *WR* 1854-2 (61-120) p.517

22. *WR* 1854-3 (61-121) p.224

23. Strangely, in these *WR* articles Hal establishes himself as a first-rate theological scholar; even as he purports to contemn theology, he exhibits a flair for it. The Church may be ignoring a modern saint here.

24. *Op.cit*. p.222

25. A later paper will address Huxley’s subsequent modification of this idealistic response, reflecting his recognition of commercial challenges to British prosperity emanating from developing economies such as those of a newly united Germany and a newly reunited USA.

26. *Op.cit*. p.225

27. *Op.cit*. p.226

28. Comte article pp.13f. Hal’s popular success in disparaging such stuff is nicely reflected in W.S. Gilbert’s 1877 libretto for the G&S operetta *The Sorcerer*, whose eponymous protagonist lists his pseudoscientific specialties: “Mirrors so magical / Tetrapods tragical / Electro-Biology / High-class astrology / Such is his knowledge he / Isn’t the one to / Require an apology” [*i.e.* ‘I’m sorry, but you are mistaken’]

29. *Cf*. H.G. Wells’s facile reference in *The War of the Worlds* to ‘the beasts that perish.’ Compare also Nettie’s epitaph for her husband in 1895 – “And if an endless sleep He [God] wills, so best” (Quoted in AD V.2 p.231)

30. *Op.cit*. pp. 234ff

31. *Op.cit.* pp.229f

32. *Op.cit*. p. 230. Hal, ‘Brother John’ Tyndall, and the rest of the X Club would later have recourse to such arguments to defend Tyndall against charges of pantheism and materialism following his Belfast Address in 1874

33. One suspects that Hal’s astonishing command of ‘the trappings and the suits’ of religious observance underlie much of the ire directed against him by Christian believers, not all of them within the Established Church. *Henricus diabolus* quotes and parses Scripture with disturbing ease

34. *Op.cit.* p.517

35. *Op.cit*. pp.528ff

36. *Op.cit.* p.529

37. *Op.cit*. p.534 [Italics mine]

38. ‘Sufficiently advanced technology is indistinguishable from magic’ – Arthur C. Clarke

39. Sumner was Establishment to the core; his mother was a cousin of William Wilberforce. Interestingly, he became an FRS just three years before Hal

40. Dictionary of [UK] National Biography: Burnett, John. London: Smith, Elder & C., 2009

41. *Op.cit.* p.522

42. *Op.cit.* p.523

43. *Op.cit.* pp.525f [Italics mine]

44*. Op.cit.* p.530

45. *Op.cit.* p.534 [Italics mine]

46. I would suggest yet another translation for this loaded term: *Pattern*. Material comes and goes: Even in that exquisitely elegant assemblage called the human brain, interchangeable atoms constantly migrate in and out of the grid of cells and their constituent molecules; but the soul (for want of a better word) remains. *λόϒος*, the Pattern, may have an existence as primary as matter – which may itself, at the most basic level, comprise mere wrinkles in cold vacuum – in other words, patterns of Nothing. These are dark deep waters; Heere bee Whales.

47. *Op.cit*. p.227

48. *Op.cit*. p.239

49. *Op.cit*. p.240 [Italics mine]

50. Eliot, T.S., *Four Quartets (Little Gidding*) Stanza V. ll.26-29 incl.

51. Title reproduced exactly from the WR review article.

52. Ouch!

53. *Op.cit.* p.541

54. *Op.cit*. p.544

55*. Op.cit.* p.548

56. *Op.cit.* p.549

57. *Op.cit*. p.556

58. *Op.cit*. p.567 [Italics mine]

59. *Op.cit*. p.569

60. *WR* 61-119 [Science category, Comte article] p.257. The Lewes passage that Hal quotes neatly summarizes his own lifelong views on religion, here recorded (perhaps for the first time) in public utterance. For Huxley, religion is an essentially emotional, suprascientific reaction to the beauty and wonder of nature. It is totally opposed to the cold, legalistic nit-picking of theologians. As Lewes remarks, “astronomy must destroy theology.”

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