

Faculty of English

**Adaptations of the Beautiful:
Natural Theological Aesthetics from Paley to Darwin**

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For My Parents and Brother

Declaration

This thesis is the result of my own work and includes nothing which is the outcome of work done in collaboration except as declared in the Preface and specified in the text. It is not substantially the same as any that I have submitted, or, is being concurrently submitted for a degree or diploma or other qualification at the University of Cambridge or any other University or similar institution except as declared in the Preface and specified in the text. I further state that no substantial part of my thesis has already been submitted, or, is being concurrently submitted for any such degree, diploma or other qualification at the University of Cambridge or any other University or similar institution except as declared in the Preface and specified in the text. It does not exceed the prescribed word limit for the relevant Degree Committee.

Abstract

The goal of this thesis is to reassess our understanding of Charles Darwin's theory of beauty by tracing the history of a distinctive aesthetic philosophy within the British natural theological tradition. I propose two new critical concepts as a way of characterising the common features of this aesthetics: "correspondency" and the "conceptual regime of the ontology of enjoyment" [CROE]. Correspondency is a term borrowed from the work of William Whewell, and aims to capture a universalised logic of adaptation as it was developed within the design argument and subsequently used to describe the aesthetic relationship between the sensorium (subject) and aesthetic object. CROE encapsulates how the *sui generis* pleasures of aesthetic experience were granted a distinctive ontological reality by this relational or adaptive model. On this foundation, I will argue that natural theological aesthetics offered a way of understanding beauty in terms of a non-Kantian teleological model – a purposeless purpose of design (or, in Darwinian sexual selection, evolution).

In the first chapter I trace this theory from William Paley, through to the *Bridgewater Treatises* and several further authors in the 1830s, exploring how the theory of beauty in these texts might be understood as a transformation of the aesthetic sense theory of the eighteenth century (a tradition exemplified by Francis Hutcheson). In the second chapter I explore how this theory was developed through the 1840s and 50s, a period that marked the increasing ascendancy of anatomical idealism within both natural theological and natural philosophical disciplines. I chart how the teleological implications of natural theological aesthetic theory allow us to rethink the relationship between the functional teleology of Paley or Cuvier, and the idealism of figures such as Richard Owen or the young Huxley. I will argue that figures associated with morphological thought utilised the same aesthetic theory and arguments as the natural theological adaptationists they critiqued, and so CROE remained a durable structure of thought across apparently contradictory paradigms. Indeed, this durability provides leverage to reassess the way in which this entire division has been historically narrated.

The second part of my thesis concerns the work of Charles Darwin, and how the public theory of beauty he developed between 1859 (the first edition of the *Origin*) and 1868 (the first edition of *Variation Under Domestication*) might be understood as a response to – and transformation of – this natural theological aesthetic theory. First, I explore Darwin's early response to the teleological ramifications of beauty, and then turn to the polemical context of the Argyll dispute as it forced Darwin to develop a more coherent aesthetic theory. I will show how Darwin's developing account of beauty took up the structure of CROE in order to naturalise the teleological challenge of intrinsic aesthetic purposiveness. Sexual selection provided a way to explain the aesthetic correlation between subject and object, with animals selecting for the conspecifics they found beautiful, and so materialising the ideal of their faculty of taste within the world itself. I will, however, argue that sexual selection was not the totality of Darwin's aesthetics, and analyse how Darwin offered a classification of different kinds of beauty based on the teleological implications of various natural forms. Alongside the real aesthetic purposiveness produced by sexual selection, Darwin offered an ontologically deflationary account of extrinsic or accidental attributions of beauty, securing his argument from contemporary critique as it continued to read Darwin's works in terms of a natural theological tradition of aesthetic theory.

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Note on Texts

All orthography has been modernised, but quoted texts remain otherwise unchanged.

Abbreviations

Works by Charles Darwin

Origin –

On the Origin of Species, 1st edn (London: John Murray, 1859)

On the Origin of Species, 3rd edn (London: John Murray, 1861)

On the Origin of Species, 4th edn (London: John Murray, 1866)

On the Origin of Species, 6th edn (London: John Murray, 1872)

Unless otherwise noted, all references to *Origin* are to the first edition text, except for Chapter IV, which uses the fourth edition text as its baseline.

Orchids –

*On the Various Contrivances by Which British and Foreign
Orchids are Fertilised by Insects* (London: John Murray, 1862)

Variation –

The Variation of Animals and Plants Under Domestication, 2 vols (London: John Murray, 1868)

Descent –

The Descent of Man, 2 vols (London: John Murray, 1871)

The Descent of Man, 2nd edn (London: John Murray, 1874)

Unless otherwise noted, where *Descent* has volume numbers it refers to the first edition text, and, where absent, the second.

Works by William Whewell

History –

History of the Inductive Sciences, 3 vols (London: Parker, 1837)

Philosophy –

Philosophy of the Inductive Sciences, 2 vols (London: John Parker, 1840)

Works by Hugh Miller

Sandstone –

Hugh Miller, *The Old Red Sandstone*, 2nd edn
(Edinburgh: John Johnstone, 1842)

Foot-Prints –

Foot-prints of the Creator, or, The Asterolepsis of Stromness
(London: Johnstone and Hunter, 1849)

Works by John Macculloch

Attributes –

Proofs and Illustrations of the Attributes of God, 3 vols
(London: James Duncan, 1837)

Works by William Paley

NT –

Natural Theology, 6th edn (London: Wilks and Taylor, 1803)

Works by Richard Owen

Limbs –

On the Nature of Limbs (London: van Voorst, 1849)

Archetype –

On the Archetype and Homologies of the Vertebrate Skeleton
(London: Taylor, 1848)

Introduction

A ‘Fatal’ Doctrine

This thesis began as an attempt to explore Charles Darwin’s aesthetic theory and its historical and intellectual contexts in detail, which, despite a growing body of contemporary academic attention, remains a project yet to be attempted in its broadest dimensions.¹ However, in pursuit of that comprehensive intention, my research ran into an unexpected problem – natural theological theories of beauty, and Darwin’s relationship to a corpus stretching from John Ray’s *Wisdom of God* (1791) to the critique of Darwin’s work mounted by the Duke of Argyll from 1862 through to his *Reign of Law* (1867).² The presence of a distinctive tradition of natural theological aesthetic theory operating in nineteenth-century British thought is rarely addressed in the literature, and, with few exceptions, is not even largely recognised to exist.³ This lacuna, and the importance that I will argue it holds for adequately understanding the eventual shape of Darwin’s approach to beauty (and the theory of sexual selection), necessitated a change to the direction of my research. My focus has narrowed, with the present work aimed instead at trying to understand this natural theological tradition of aesthetic theory in the 1800s, its transformation from the period of Paley’s *Natural Theology* (1802) through the growing influence of idealist morphology into the 1850s, and how Darwin’s own public theory of beauty developed through the 1860s might be productively

¹ See note 31 below.

² John Ray, *The Wisdom of God Manifested in the Works of Creation* (London: for Samuel Smith, 1691); George Campbell [Duke of Argyll], *The Reign of Law* (London: Alexander Strahan, 1867).

³ For a general historical overview, see John Brooke and Geoffrey Cantor, *Reconstructing Nature* (Edinburgh: T&T Clark, 1998). Regarding an earlier period, this tradition has been discussed in its British context by Alexander Wragge-Morley, *Aesthetic Science* (Chicago: University of Chicago Press, 2020); and, within a German context, in *Physico-Theology: Religion and Science in Europe 1650-1750*, ed. by Ann Blair and Kaspar von Greyerz (Baltimore: Johns Hopkins University Press, 2020). Addison’s aesthetics has been recently discussed within the context of natural theology; see, Brian Norton ‘Aesthetics, Science, and the Theatre of the World,’ *NLH*, 51 (2020), 639-659. For the relationship between natural theological and physiological aesthetics in the nineteenth century, see Benjamin Morgan, *The Outward Mind* (Chicago: University of Chicago Press, 2017). For discussion of the role of natural theology within the ‘Seaside Books’ of the 1840s and 50s, see Johnathan Smith, *Charles Darwin and Victorian Visual Culture* (Cambridge: Cambridge University Press, 2006), pp. 68-92. Paley’s aesthetics has been broached in Peter Heymans, *Animality in British Romanticism* (Abingdon: Routledge, 2012), pp. 158-168.

understood as an addition to, and transformation of, this model for understanding purported beauty in nature and beyond.

There is no clearer way of outlining this problem than a passage initially offered in the first edition of the *Origin* (1859), but which would undergo substantive revisions in the 1866 text of the *Origin* and in the sixth edition of 1872.⁴ Under the general heading of ‘difficulties on theory,’ Darwin made anonymous reference to the

protest lately made by some naturalists, against the utilitarian doctrine that every detail of structure has been produced for the good of its possessor. They believe that very many structures have been created for beauty in the eyes of man, or for mere variety. This doctrine, if true, would be absolutely fatal to my theory.⁵

I will return to precisely who these ‘naturalists’ were in due course, but evidenced here is the basic threat that beauty represented for Darwin’s theory as it was caught between the conflict of two teleological doctrines; the first, that function or utility governed the existence of biological structures and forms, and the second, that aesthetic criteria – specifically ‘created for beauty’ or ‘mere variety’ – represented an order of rival ends within the design of nature. If the beauty of nature was the otherwise purposeless purpose of creation, and form as we encountered it was at least partially governed by its logic, ‘this doctrine’ would be ‘fatal’ to natural selection as a theory of adaptive function or utility (the ‘good’ of the ‘possessor’).⁶ Malthusian struggle might produce advantageous changes of structure through succeeding generations of living beings, but such a mechanism had no purchase within an aesthetic domain. Although Darwin would go on to explore other teleological problems of organic form in this passage, not least the relationship of efficient causal mechanisms operating to influence the variation and development of organisms (i.e. the direct action of ‘physical conditions’ and ‘correlation of growth’), or the relationship of history to the observed forms of the present (‘the chief part of the organisation of every being [...] simply due to inheritance’), beauty remained emblematic of all these other difficulties regarding the purposiveness of living structures.⁷ Borrowing the coinage of Ernst Haeckel, there was a

⁴ See *Origin*, pp. 199-203; *Origin*, 4th edn, pp. 237-243; *Origin*, 6th edn, pp. 159-164.

⁵ *Origin*, p. 199.

⁶ For discussion of this ostensibly Kantian phrasing see pp. 17-19 below.

⁷ *Origin*, p. 199.

‘dysteleology’ of living forms that must be accounted for by any evolutionary theory, which, as George Romanes put it in an article in *Nature* from 1874, comprehended the many ‘purposelessnesses’ marking apparently maladaptive biological structures from rudimentary or vestigial organs to ornamental or beautiful form.⁸ Condensed within the image of the organism as an aesthetic artefact, something about the philosophical implications of beauty offers powerful intellectual leverage for understanding much wider issues of organic teleology in the life sciences of the period.

The canonical explanation Darwin adduced for the beauty of living organisms was sexual selection, where, as Darwin put it in this same passage of *Origin*, the ‘effects of sexual selection, when displayed in beauty to charm the females, can be called useful only in rather a forced sense.’⁹ Phrased in terms of a simple binary, natural selection produced utilitarian purposiveness, and sexual selection, as a second selective process operating in nature, produced an aesthetic purposiveness. Certainly, Darwin’s theory of beauty has generally been understood as directly linked to sexual selection – that sexual selection *is* Darwin’s theory of beauty – and therefore, as Winfried Menninghaus has lamented, ‘many important theoretical distinctions Darwin proposed [...] have gone completely untreated’ in the rush to treat sexual selection as *the* master category of Darwin’s aesthetics.¹⁰ Thought more narrowly relative to the arguments of natural theology, sexual selection ensured that beauty could be saved from the design argument, where, as Evelleen Richards has phrased the broadest outlines of this link, sexual selection plugged the gap and ‘explained what natural selection (the struggle for existence) could not’ by offering ‘a naturalistic, as opposed to divine account of beauty and its perception.’¹¹ Darwin did not deny the reality of beauty, but brought aesthetic purposiveness within the bounds of secondary law. This is, as far as it goes, perfectly true, and the most general relationship of sexual selection to natural theological argument is well attested, not least because Darwin himself made this connection explicit.¹² Given the reach and detail of her work in other regards – from Joshua Reynolds to nineteenth-century fashion

⁸ See George Romanes ‘Natural Selection and Dysteleology,’ *Nature*, 9 (1874), 361-362. For Haeckel’s own account of ‘dysteleology’ see Ernst Haeckel *Generelle Morphologie der Organismen*, 2 vols (Berlin: Georg Reimer, 1866), II, pp. 266-268; and Ernst Haeckel, *The History of Creation [Natürliche Schöpfungsgeschichte]*, trans. by Henry Lankester, 2 vols (London: Henry King & Co., 1876), I, pp. 15-16.

⁹ *Origin*, p. 199.

¹⁰ Winfried Menninghaus, *Aesthetics After Darwin*, trans. by Alexandra Berlina (Boston: Academic Studies Press, 2019), p. ix.

¹¹ Evelleen Richards, *The Making of Sexual Selection* (Chicago: University of Chicago Press, 2017), p. xvii.

¹² See, for instance, *Descent*, II, pp. 231 & 401.

writing – Richards’s *Making of Sexual Selection* underlines how major gaps remain in our understanding, as, whilst aware that Darwin’s theory of beauty had a direct relationship to natural theological discourse as it undermined the supremacy of adaptive utility, this polemical context is broadcast by Richards without any detailed reading of this natural theological theory and how its explanatory framework and structure were concretely reflected in Darwin’s thinking.¹³ Indeed, as soon as I went in pursuit of details, a far more complex picture of Darwin’s aesthetic thought emerged, not only in that sexual selection took on many of the characteristic features of the theory it was positioned to replace, but that it contained within itself a degree of teleological sophistication that has been otherwise lost in readings of Darwin’s aesthetics, synthesising an efficient causal dysteleology of morphology – the ‘free play of the various laws of growth’ – with an account of intrinsic aesthetic ends produced by the agency of selection (and so, paradoxically, a *teleological* dysteleology).¹⁴

This is a complication for later; for now, my question is simply who were those ‘naturalists’ from which sexual selection represented a means of escape? Although this passage of *Origin* might seem like an obvious location by which to open discussion of the relationship between Darwin and natural theology, even this elementary aspect – what ‘protest’ Darwin was referring to, and why it was so subversive – seems to have eluded historical commentary.¹⁵ Yet, manuscripts of the ‘Big Book’ (1856-58), which Darwin characterised *Origin* as the ‘abstract’ of, reveals who Darwin was referring to in a pair of scribbled references: Thomas Huxley’s ‘On Natural History, as Knowledge, Discipline and Power,’ an address delivered to the Royal Institution on 15th February 1856, and Charles Kingsley’s *Glaucus* (1855).¹⁶ Giving my reader a proper apprehension of why this matters so

¹³ Where, in Richards’ words, ‘the beauty of the natural world lay within the largely unchallenged realm of natural theology’ and Darwin ‘was compelled to find and promote a persuasive alternative to the established creationist view’ (Evelleen Richards, pp. 291-292).

¹⁴ *Origin*, p. 150.

¹⁵ Although the reference below (note 16) is there to be found, there is a dearth of commentary regarding what these works, and through them natural theological aesthetics, might mean for Darwin’s work. Charitably, Adrian Desmond *might* be alluding to Darwin’s engagement with Huxley in his biography of Huxley, but offers no commentary. See Adrian Desmond, *Huxley: From Devil’s Disciple to Evolution’s High Priest* (London: Penguin, 1998), p. 236. Symptomatically of this general omission, even where one of the relevant references in question has been discussed relative to Darwin, the specifically aesthetic-teleological importance it holds for the *Origin* has been overlooked; see Gowan Dawson, *Show me the Bone* (Chicago: University of Chicago Press, 2016), pp. 211-242.

¹⁶ *Origin*, pp. 1-2; Thomas Huxley, ‘On Natural History, as Knowledge, Discipline and Power’ in *Notices of the Proceedings at the Meetings of the Members of the Royal Institution*, vol. 2, 1854-1858 (London: William Clowes, 1858), pp. 187-195; Charles Kingsley, *Glaucus* (London: Macmillan, 1855), pp. 100-102. For Darwin’s references

much will take the length of this thesis, but, in short, Huxley and Kingsley were offering explicitly aesthetic rationalisations of design ranged against the adaptive functionalism of Paley or Cuvier in natural theological and historical-philosophical discourse. The importance of these bibliographic fragments is that they offer concrete proof for how Darwin's argument was, in certain key aspects, a response to an explicitly aesthetic understanding of design. As Huxley put this aestheticisation of organic form, the failed 'principle of adaptation [...] is replaced by another which appeals to the aesthetic sense as much as the mere intellect.'¹⁷ Through the conceptual archaeology of natural theological aesthetic theory that spans the first part of this thesis, I will show how Kingsley and Huxley – before their common conversion to descent theory following the publication of *Origin* – represented just two expressions of a traceable, widespread and generically identifiable natural theological theory of beauty; one which, by an idealistic turn through the 1830s-50s, was itself the transformation of an earlier current of Paleyan aesthetic arguments. Indeed, as I will explore regarding earlier authors, the very paradoxes that a natural theological theory of beauty encountered in trying to reconcile functional and aesthetic teleology made a shift towards idealist philosophemes attractive.

That there is, in some way, an important relationship between Darwin's work and an anglophone tradition of natural theology is widely acknowledged and has attracted a considerable body of commentary.¹⁸ This is hardly surprising given how freely Darwin advertised such influence, confessing in his autobiography that 'the old argument from design in nature, as given by Paley [...] formerly seemed to me so conclusive,' or writing in *Descent* that his focus on the adaptive purposiveness produced by natural selection was a function of his attempt to 'annul the influence of my former belief, then widely prevalent, that each species had been purposely created.'¹⁹ By the 1990s this profound link had become received

to Huxley and Kingsley in the 'Big Book,' see Cambridge University Library [CUL]-DAR11.2.86r, or Charles Darwin ed. by Robert Stauffer, *Natural Selection* (Cambridge: Cambridge University Press, 1975) p. 379.

¹⁷ 'On Natural History,' pp. 192-3.

¹⁸ As a representative sample of works within a voluminous literature see Neal Gillespie, *Charles Darwin and the Problem of Creation* (Chicago: University of Chicago Press, 1979); Dov Ospovat, *The Development of Darwin's Theory* (Cambridge: Cambridge University Press, 1981); Robert Young, *Darwin's Metaphor* (Cambridge: Cambridge University Press, 1985); John Cornell, 'God's Magnificent Law,' *Journal of the History of Biology*, 20 (1987), 381-412; David Kohn, 'Darwin's Ambiguity,' *British Journal for the History of Science*, 22 (1989), 215-239; Michael Ruse, *Darwin and Design* (Cambridge, M.A: Harvard University Press, 2004).

¹⁹ See, Charles Darwin, ed. by James Secord, 'Recollections of the Development of My Mind and Character' [CUL-DAR26] in *Evolutionary Writings* (Oxford: Oxford University Press, 2008), pp. 355-426: p. 393; *Descent*, I, pp. 152-153. Apropos Darwin's exposure to Paley's writing as part of the Cambridge curriculum, see Aileen Fyfe, 'The

wisdom, and, reflecting on the consensus that had been achieved in the Darwin industry and beyond, for Frank Turner the terms of the debate might even be characterised as ‘whether or not Darwin was the last of the great natural theologians’ – whether Darwin’s ‘categories of thought as well as problems that he believed he must address and carry to satisfactory solutions through the concept of natural selection derived from natural theology.’²⁰ Thought solely in terms of the functional teleology of natural selection, the most obvious trope of thought bequeathed to Darwin from natural theology was the explanatory centrality of adaptation, and this claim is neither new nor controversial, with Darwin himself clearly articulating that natural selection was first and foremost a theory of adaptation on many occasions.²¹ Adaptation was both *explanandum* and *explanans* for Darwin, as the apparent design evidenced by adaptation had to be recovered for naturalistic explanation, whilst also hedging natural selection as the vehicle of descent with modification against competing mechanisms of transmutation.²² As Dov Ospovat expressed the relationship of Darwin’s early work to its sources, ‘the structure of Darwin’s theory was to a large extent determined by what, for convenience, I call natural theological ideas or assumptions,’ foremost among which was the idea ‘that the adaptation of organisms to their environment is perfect.’²³ Although I will return to this characterisation in the second chapter, including how it might be superseded, for Ospovat the doctrine of ‘perfect adaptation,’ and Darwin’s attempt to explain ostensible examples of perfect adaptation in nature, represented the determinate trace of the production of the theory of natural selection from the resources of natural theology.

So, as a nonspecific point, the profound relationship between the Darwinian corpus and natural theological writing is not at question. However, it would be wrong to thereby conclude that the history of Darwin and natural theology has already been written. I don’t think it is unfair to characterise works such as *NT* or the *Bridgewater Treatises* as more cited

Reception of William Paley’s “Natural Theology” in the University of Cambridge’ *British Journal for the History of Science*, 3 (1997), 321-335.

²⁰ Frank Turner, *Contesting Cultural Authority* (Cambridge: Cambridge University Press, 1993), pp. 18-19.

²¹ Darwin did so on several key occasions stretching the length of his career, from early letters to Joseph Hooker when he first discussed his views with scientific contemporaries, to the opening pages of the *Origin* (pp.3-4). See, ‘Letter to J.D Hooker, 11th January 1844,’ *The Correspondence of Charles Darwin*, ed. Burckhardt et al., 29 vols (Cambridge: Cambridge University Press, 1985 -), III.

²² Darwin’s explicit targets in the *Origin* were Lamarck and Robert Chambers. The clearest example of this framing of natural selection regarding other theories of transmutation can be found in Darwin’s addition of the ‘Historical Sketch’ in Charles Darwin, *Origin*, 3rd edn, pp. xix-xix.

²³ Ospovat, pp. 2-3. See also George Levine, *Darwin and the Novelists* (Cambridge, M.A: Harvard University Press, 1988), pp. 43 and 85.

than read, and so, on exploring these texts, I was struck by the continued intellectual possibilities they offered, both on their own terms, but also for understanding Darwin's work. Where the detailed arguments of natural theological discourse remain understudied, its aesthetics and teleological corollaries have not been understood, and thus, *a fortiori*, its relationship to Darwin's work and the teleology of selection has never been adequately grasped. Rather than assuming natural theology as some monolithic cultural and intellectual formation, I will argue that even authors ranged against it from the side of anatomical idealism, from Owen to Kingsley to the young Huxley, were offering a version of the natural theological argument they claimed to contest, arrogating the teleological convolutions Paleyan functionalism had proposed in order to preserve beauty as an end of creation. The philosophical manoeuvres of several generations of authors as they attempted to mitigate the paradoxes of natural theological design became the coordinates that would produce Darwin's own theory of beauty, and structure his understanding of its teleological ramifications. The attack on the 'utilitarian doctrine' was not, after all, initially directed at Darwin, but epitomised a split within the argument from design, with a pre-existing debate regarding functional adaptation and the purposeless purposes of aesthetics replicated within Darwin's theory. The intimate constellation of teleological and aesthetic questions in Darwin's writing ensured that in order to solve the problems of purpose and design that dogged the reception of the theory of natural selection, Darwin would be forced to simultaneously provide an account of beauty. Darwin's achievement was not the novel theorisation of beauty as an excess to function that undermined the teleology of natural theological purpose, but was the undertaking by which he naturalised the teleological rift that was already at the heart of this tradition and turned it to some other work.

Adaptation and Pleasure – Defining Natural Theological Aesthetics

What, then, is this natural theological aesthetics? In positing the existence of this tradition, I claim to address a gap in our historical understanding of nineteenth-century accounts of beauty, particularly in the continued importance of aesthetic sense theory against the

claimed ascendancy of associationism.²⁴ Indeed, this theory often acted as a philosophical and theological absolutisation of the logic of eighteenth-century aesthetic sense theories (and otherwise heterogenous appeals to an intuitive faculty of taste), utilising similar arguments to figures such Hutcheson but also transforming and updating such claims in line with both adaptationist preoccupations and, given its increasing pre-eminence through the 1840s and 50s, the resources of transcendental anatomy. Much of the work needed to outline its basic aspects and convincingly argue for its existence must wait until the first chapter, but for now it is worth clarifying what an aesthetics might mean in this period, and the two key concepts that I identify as central to its specifically natural theological operation: “correspondency,” and the “conceptual regime of the ontology of enjoyment” [CROE].

Admittedly, the term aesthetic is a partial anachronism, and despite the increasingly widespread use of the ‘aesthetic’ through the 1830s and 40s the authors discussed here did not initially utilise the vocabulary of ‘aesthetics,’ with Robert Chalmers and John Macculloch – two figures considered in the first chapter that provided extensive natural theological aesthetic theories – instead referring to their work as a ‘philosophy’ or ‘theory’ of ‘taste’ or ‘beauty.’²⁵ There were exceptions, however, with Whewell critically engaging with the language of philosophical aesthetics via his proposal to rebaptise such discourse as ‘callaesthetics’, understanding that it was ‘desirable to reform’ our vocabulary in line with the production of a new ‘science of the perception of beauty’ in contradistinction to a ‘doctrine of perception’ or sensuous cognition (*pace* Baumgarten) considered indifferently.²⁶ Yet, a change was underway during the 1840s and 50s, and, as above, by 1856 Huxley was discussing nature itself as a composition designed to appeal to the ‘aesthetic sense,’ and Hugh Miller likewise enfolded his natural theological approach to beauty under the head of an aesthetics (see Chapters II and III). Darwin himself did not initially use this terminology to frame his discussion of beauty and its experience, but by the time of *Descent* (1871) the category of the ‘aesthetic’ had widely infiltrated both public and academic discourse, and Darwin would start using this vocabulary. However, Darwin’s definition of the ‘æsthetic faculty’ was coterminous with that of a ‘taste for the beautiful,’ and this shift in terminology did not represent a

²⁴ See Chapter I for consideration of this claim relative to extant narratives in the history of aesthetics.

²⁵ See, for example, Thomas Chalmers, *The Adaptation of External Nature to the Moral and Intellectual Constitution of Man*, 3rd edn, 2 vols (London: William Pickering, 1834), I, p. 12 and II, p. 74; and Macculloch, III, pp. 249 and 264.

²⁶ *Philosophy*, I, p. cxx.

fundamental shift in theoretical position away from beauty as the privileged category of his aesthetics as it had been developed from 1859 through to that juncture.²⁷ Given these overlaps, I don't see it as misleading to describe this bundle of theories regarding the existence of beauty, its perception, and its pleasures as an aesthetics. My usage is envisaged as an actor category reflective of Darwin's own understanding and definition of aesthetics as he responded to natural theological theories of beauty. Consequently, by aesthetic teleology I intend the structure of purposiveness implied by the claimed beauty of (generally natural) objects, the kind of finality implied in their production, and how this relates to the aesthetic enjoyment of perceptive subjects – human or otherwise – as they engage with such forms.

In outline, the authors discussed here largely understood beauty, the central category of their aesthetics, as an objective property of objects, designed to elicit a unique form of *pleasure* in a subject. Taste is the *sui generis* receptive faculty for this beauty. Although different senses have their own kinds of aesthetic pleasure, they are generally understood through the categories of visual enjoyment. For example, Macculloch understood the 'pleasures derived from the sense of seeing' as the paradigmatic function of taste, making it the cornerstone of any approach to the 'difficult question of Beauty.'²⁸ That being said, it would be a mistake to understand visual perception as the sole determinant of this theory, with the pleasures of visual beauty simply exemplifying the underlying structure of aesthetics more generally; namely, the logic of enjoyment in excess to utility or the functional teleology of design as such. Crucially, the ascription of beauty to an object was not resolvable in terms of subjective association or redefinition in terms of some other pleasure, remaining largely uninterested in questions of normative value or the interplay of universality and individuality in the form of aesthetic judgement. Beauty was understood as an objective property in the world that the natural theologian could discover immediately and intuitively, in the same way that design was discovered inductively in observed complexity (Paley's notorious watch on the heath). Real beauty inhered in the world, and, as I will discuss, was claimed to find its principle in *God's own aesthetic judgement*. Such theories of beauty were not theories of fine art or the production and experience of artworks, and commensurately not particularly interested in the arts or fine arts as offering up examples of beauty. Instead, they typically

²⁷ See, for instance, *Descent*, I, p. 64.

²⁸ Macculloch, III, p. 242.

focussed on the created world at large and the beings that inhabited it, the experience of natural beauty representing a distinctive mode of aesthetic access to the designed cosmos.

Where aesthetic enjoyment was not just possessed of an ontological status as a mental property of the subject, but had an objective substrate in the world, the argument from design circularly guaranteed the security of this correlation, with God ordaining the ‘correspondency’ between our aesthetic sense and the properties of the forms it would discover. The term ‘correspondency’ was used by William Whewell in his *Bridgewater* as a way of phrasing an expanded concept of adaptation – the claim that all things in nature are adaptations themselves coadapted to exist alongside all other things in nature – and I use this term because its rarity allows it to function as a neologism for describing this logic as it became so important to post-Paleyan natural theology.²⁹ As a theory of the universal adaptation of all objects and beings to all others within a totalising framework of design, correspondency includes the adaptation of the sensorium and mental capacities to the created world. Mind discovers itself in the materiality of nature, suturing, by a claim to their mutual and harmonious adaptation, the metaphysical wounds of substance dualism otherwise lurking in appeals to this venerable philosophical binary. Given this universalised logic of adaptation, judgements regarding beauty were prototypical of this procedure, asserting the circular claim that our aesthetic as well as our epistemic intuitions are themselves indicators of the teleology they pretend to discover in nature, each taken as the proof of the other, and thereby of a preestablished ‘correspondency’ between these two orders. Benjamin Morgan has argued for the ‘pervasiveness’ of a cognate logic in his discussion of other figures associated with a natural theological tradition of aesthetic theory (notably George Field, 1777–1854), all relying, in some way, on ‘explanations of beauty as a moment of concordance between human beings and natural surroundings’ as it was secured by an overarching architectonic of design.³⁰

I will argue in the first two chapters that where this generalised logic of correspondency took on a specifically aesthetic form in a group of authors stretching from

²⁹ See, for instance, William Whewell, *Astronomy and General Physics Considered with Reference to Natural Theology* (London: William Pickering, 1833), p. 13.

³⁰ Morgan, pp. 36–7. This logic and its link to theological discourse is readily discernible through the 1700s. I will discuss Hutcheson and Kames, but other figures have been noted in similar terms, for instance, Abigail Zitin’s account of adaptation for a range of eighteenth-century aesthetic theorists, or Brian Norton’s reading of Addison. See Abigail Zitin, ‘Fittest and Fairest,’ *ELH*, 82 (2015), 845–868; Norton.

1800 to 1870 – including, among many others, William Paley, the *Bridgewater* authors, John Macculloch, Hugh Miller, Charles Kingsley, and Thomas Huxley – the common element within this flowering of a distinctive natural theological approach to aesthetic questions can be characterised as the “conceptual regime of the ontology of enjoyment” [CROE]. Although a slightly unwieldy piece of jargon, I use the locution of CROE to capture the sense that a diverse group of authors were all working under a similar set of assumptions regarding the status of aesthetic enjoyment and divine design. By “conceptual regime” I try to apprehend the idea of a common (and often unspoken) structure of thought or set of governing preconceptions and logical preconditions, representing something like an *episteme* considered within the localised domain of aesthetic discourse. Where enjoyment in excess of functional utility was understood as specifically ordained by design, it was invested with a secure status by the adaptive framework of correspondency. As our faculties for certain modes of enjoyment were coadapted to the objects in the world designed to elicit it, felt pleasure could be hypostasised as a bodily symptom of design.

At the most fundamental level, CROE seeks to characterise how a selection of theological, philosophical and scientific authors all came to understand beauty as a relational property. By relational property, I mean that beauty was understood as ontologically prior to both the beautiful object as it possessed some real quality perceived by a subject, and the mind that experienced such beauty through the faculty of taste (the aesthetic enjoyment of the perceptive subject). Rather than locating beauty (and the underlying cause of the experience of beauty) in either mind or object, natural theological aesthetics located the reality of beauty within the adaptational structure of design itself as it reciprocally fitted mind and object to each other. To grasp what these authors were striving to achieve, we must somehow think object-subject polarities as being subsumed by this fundamentally relational concept of beauty. Through CROE, both the external manifestation of beauty (object) and the mental pleasure of beauty (subject) were comprehended within a single broader framework, with the relationship between mind and world therefore possessed of its own ontological dimension as a preestablished aspect of design (and therefore cannot just be framed as the epistemic question of knowing any subject-independent property of beauty, or the more general relationship inhering between sensorium and world). Accordingly, the authors discussed in this thesis present a degree of conceptual foreignness we must try to think ourselves into, with questions regarding the “reality” of beauty as a property thought in terms

of the bidirectional and simultaneous adaptation of subject and object, rather than in terms of an exclusionary decision regarding the priority of either material object or perceiving mind as the ultimate substrate within which we accord beauty this measure of reality. Through this model, the relational framework of aesthetic adaptation was discussed, (mis)recognised and philosophically deployed as a stable and knowable entity in itself, with the correlation between the sensorium and object reified as a preordained 'thing' by arrogating an imagined God's-eye-view of creation. However, as I will explore as my thesis progresses, this conceptual regime could function to superintend thinking about beauty even in cases of apparently incompatible supplementary assumptions; legible across Paleyan functional teleology, morphological approaches to design, an idealism that saw the beauty of nature as God's self-relationship, and, critically, Darwin's theory of beauty. The paradigm of adaptive function and even design itself became optional, but the relational framework used to understand beauty was preserved.

In the second part of my argument, I provide discussion of the development of Darwin's theory of beauty during the pivotal years of 1859 to 1868; a theory developed in opposition to the natural theological critique of Darwin's thought mounted, most notably, by the Duke of Argyll. There have been many influence studies of Darwin's aesthetics, from continental Romanticism through to the 'homegrown aesthetics' of Burke, Reynolds or Wordsworth.³¹ Such studies, however, have offered only limited resources for tackling the most fundamental philosophical architecture of what Darwin's theory of beauty was aiming to achieve. My goal is not to deny the importance of any of these other routes into Darwin's aesthetic theory, or even just offer another, but to rebalance our broader perspective by modifying the framework we use to narrate the nineteenth-century sciences and their

³¹ Evelleen Richards, p. xxv. For Darwin's use of aesthetic categories, see David Kohn, 'The Aesthetic Construction of Darwin's Theory,' in *The Elusive Synthesis*, ed. by Alfred Tauer (London: Kluwer, 1997) pp. 13-48. There is a marked focus on the visual in the literature regarding Darwinian aesthetics, not least Evelleen Richards, for whom it 'cannot be overemphasised' (see Evelleen Richards, p. xxiv); see also, Johnathan Smith, *Charles Darwin and Victorian Visual Culture*; Julia Voss, *Darwin's Pictures*, trans. by Lori Lanz, (Newhaven: Yale University Press, 2010); *Darwin and Theories of Aesthetics and Cultural History*, ed. by Sabine Flach and Barbara Larson (Farnham: Ashgate, 2013); *Endless Forms*, ed. by Diana Donald and Jane Munro (London: Yale University Press, 2009). Regarding various influence studies, Robert Richards has proved an important partisan for the claims of continental romanticism; see Robert Richards, *The Romantic Conception of Life* (Chicago: University of Chicago Press, 2002). For claims to the influence of British Romanticism, see, among others, David Amigoni, *Colonies, Cults and Evolution* (Cambridge: Cambridge University Press, 2007). Alongside Evelleen Richards, for discussion of the legacy of eighteenth-century British aesthetics in Darwin's work, see Barbara Larson, 'Darwin, Burke, and the biological Sublime,' in *Darwin and Theories of Aesthetics*, ed. by Flach and Larson, pp. 17-37.

relationship to the teleology of design. In my reading of Darwin, I focus on a single snapshot of time – before *Descent* (1871) and its well-traversed account of beauty – because it represents the critical window during which Darwin had to develop the fundamentals of his mature aesthetic theory as a response to the teleological patterns of natural theological argument. The identification and analysis of Argyll's critique of Darwin as a generic expression of natural theological aesthetics constitutes the foundation for my further claim that Darwin's theory of beauty should be read as a transformation of the common heritage of CROE, reinscribing its adaptive and relational understanding of beauty. As evidenced by Charles Kingsley, even sympathetic contemporaries could subsequently read Darwin's theory back into the terms of natural theological aesthetics, and so part of Darwin's struggle in the elaboration of his theory of beauty from the 1866 text of *Origin* onwards was to obviate the reappropriation of sexual selection for the intellectual purposes of design. Thereafter, Darwin's account of non-selective biological mechanisms in *Variation* (1868) – synthesised as the theory of pangenesis – and *Descent* (1871) became decisive for preventing the theistic recapture of sexual selection. Where previous discussions of Darwin's aesthetics have largely centred on his early notebooks (c. 1837-1840) or *Descent*, they have offered fewer resources for understanding the difficulties Darwin faced during the 1850s and 60s. Within the space of a thesis, this episode offers the clearest indication of how Darwin's aesthetics was developed as a solution to teleological problems; not just sexual selection, but beauty as dysteleology, and thus the interaction of aesthetic agency with efficient causal mechanisms of variation and development. This was, by and large, a theoretical apparatus that Darwin would achieve by 1868, not 1871.

There are, however, persistent difficulties in characterising Darwin's theory of beauty, because, despite offering extensive discussion of various modes of beauty and prospective causal mechanisms for their production and reception, Darwin remained evasive when it came to defining the central terms and philosophical commitments of his aesthetics. Indeed, Darwin only finally clarified what he understood by beauty in the sixth edition of *Origin* (1872) and second edition of *Descent* (1874), gesturing towards a family resemblance concept comprehending several distinct modalities of sensory pleasure, noting that 'I refer here only to the pleasure given by certain colours, forms, and sounds, and which may fairly be called a

sense of the beautiful.’³² The *sui generis* ‘aesthetic faculty’ receptive of these forms of sensory ‘pleasure’ was common to many animals and therefore, vitally, ‘not of a special nature in the human mind.’³³ Further to its generality, such pleasure was openly framed as unanalysable, perhaps explaining Darwin’s reticence – even inability – to define it. As Darwin wrote, any causal question of *why* pleasure is produced by certain forms ‘cannot, I presume, be explained.’³⁴ The pleasures of beauty were conceptually primitive, so, whatever the undeniability of a *sui generis* aesthetic faculty – ‘the perceptive powers of man and the lower animals are so constituted that brilliant colours and certain forms, as well as harmonious and rhythmical sounds, give pleasure and are called beautiful’ – the impasse remained that ‘why this should be so, we know no more than why certain bodily sensations are agreeable and others disagreeable.’³⁵

The subjective polarity of Darwin’s aesthetic theory – the experience of beauty in the mind – was centred on the brute fact of pleasure, with aesthetic subjects somehow ‘so constituted’ to take pleasure in certain forms, without being able to provide any meaningful analysis of this pleasure; the bare operation of the ‘nerves of taste,’ as Darwin put it elsewhere.³⁶ This facultative explanation, in its avowed ignorance, was something of an equivocation, gesturing to an assumed but untraceable material ground of aesthetic pleasure in our neuroanatomy. However, by the 1870s Darwin cleaved to this physiologically reductive model, noting that although ‘how the sense of beauty in its simplest form [...] was first developed in the mind of man and of the lower animals, is a very obscure subject [...] there must be some fundamental cause in the constitution of the nervous system in each species.’³⁷ Yet, Darwin did not abjure all explanatory texture, making clear that this was a theory of taste that could be supplemented with a hereditary theory of mind, so if not explained *as a* pleasure, still made to cohere with common descent through a malleable faculty of taste. As I shall explore in Chapter IV, from *Variation* onwards a model of mind as hereditary habitus – the inheritance of acquired mental characteristics – took on this explanatory labour, by showing how the habituation of taste to objects in the world explained why ‘that which is at

³² Charles Darwin, *Descent*, p. 92; *Origin*, 6th edn, p. 162.

³³ *Descent*, p. 94.

³⁴ *Ibid.*, p. 92.

³⁵ *Descent*, II, p. 353.

³⁶ *Ibid.*, I, p. 12.

³⁷ *Origin*, 6th edn, p. 162.

first unpleasant to our senses, ultimately becomes pleasant.’³⁸ Where ‘habits are inherited,’ taste was therefore both innate *and* plastic.³⁹ By sexual selection operating on the foundation of this shifting taste, certain kinds of beauty or ornamentality (a species-idea of beauty or ‘beau ideal’) were built by organisms into the materiality of the world itself and became, quite literally, *for them*.⁴⁰ A distributed agency across multiple generations produced purposiveness of form for the aesthetic sense, with the relational structure of CROE thereby naturalised. Beauty remained in the relationship between the percipient and an intrinsic property of the object as it was secured by teleological agency. Thus, one of the interests of Darwin’s theory of beauty is that it undercuts the intuition that claims to real teleological structures in nature must somehow imply design, instead offering a distinctive vision of how an agency immanent to the world produced forms that possess an intrinsic and real (non-regulatory) purposiveness. A naturalistic teleology is recoverable, and beyond the model of the *ars* or *technē* of human actants as it had been projected onto some plane of ontotheological transcendence in God the designer or artist, Darwin’s explanation of beauty implied not only a perceptive subject making a judgement on beauty, but altering aesthetic form through mate choice. Natural beauty understood within the paradigm of CROE no longer necessarily implicated divine taste, but instead took into consideration a plurality of non-human tastes that realised themselves, consciously or unconsciously, in the form of their conspecifics.

Where the pleasures of aesthetic experience were understood as unanalysable *qualia*, CROE took on a particular importance, providing a vocabulary to structure discussions of otherwise inexpressible states of mind, and in its use of this conceptual architecture Darwin’s theory remained close to its natural theological sources. Take, for instance, this brief passage from the discussion of beauty in John Macculloch’s *Attributes*, a text which Darwin read in some detail during the 1830s and will be discussed in Chapter I:

He [God] has [...] appointed an instinctive feeling of Beauty, or commanded that certain forms and colours shall produce pleasure, simply and directly: while, of the actual causes of this pleasure, as of the condition of mind which it implies, we are entirely ignorant. [...] This feeling of Beauty is therefore a portion of the original constitution of Mind.⁴¹

³⁸ *Descent*, p. 92.

³⁹ *Ibid.*, p. 92.

⁴⁰ See, for instance *Origin*, 4th edn, p. 239.

⁴¹ Macculloch, III, p. 263.

For both Darwin and Macculloch, aesthetic pleasure was framed as the question of the ‘constitution’ of mind or sensorium relative to its proper objects, whether we take this constitution to be the result of timeless divine fiat or a secondary causal process of adaptive modification. Given this common central commitment, CROE (aesthetics defined relationally as adaptation-for-pleasure) could be maintained through the shift from design to descent to explain why we take pleasure in form without any great need for detailed causal explanation of this *experienced* pleasure.

On this terrain both Darwin and Macculloch remained close to their eighteenth century sources, whether it be Burke’s formulation of beauty as unanalysable yet also ultimately resolvable into a ‘natural tendency to relax the fibres’ of the body in the experience of certain objects, or, despite different philosophical commitments, Hutcheson’s foundational account of the ‘absolute beauty’ of certain objects or experiences displaying ‘uniformity amidst variety,’ that, ‘by the very Frame of our Nature,’ are ‘made the occasion of Delight.’⁴² Where correspondency (universal coadaptation) underpinned CROE as the basis of natural theological aesthetics, it posited that our bodies and minds were constructed in harmony *ab initio*. Thus, an internal sense theory of beauty bled through into a physiological claim, with a strong commitment to adaptationist explanation entailing a constant oscillation between the mental and physical. Although we cannot develop a rational account of aesthetic pleasure for any determinate object or subject, CROE was a kind of *epoché*, attending only to the structural aspect of aesthesis and its largely abstract conditions of possibility and production, becoming philosophically compelling as a speculative teleological scaffold *because* of the very unanalysability it circularly posited. Yet, as I will explore, this theoretical apparatus was also flexible, with its adaptational and teleological pattern of thought (focussed on intrinsic aesthetic purposiveness as the relationship between a subject and object producing pleasure) plugged into multiple explanatory frameworks, from a strict vision of adaptive design, through to a temporal and open-ended model of the adaptation of mind to aesthetic objects as dynamic process. CROE represented a durable structure of thought operating across apparently antagonistic viewpoints because it offered a way of talking about

⁴² Citing Darwin’s edition, see Edmund Burke, *A Philosophical Inquiry into the Origin of Our Ideas of the Sublime and Beautiful*, 2nd edn (London: Thomas Lean, 1823), p. 221; and, Francis Hutcheson, *Francis Hutcheson: an Inquiry Concerning Beauty, Order, Harmony, Design*, ed. by Peter Kivy (The Hague: Martinus Nijhoff, 1973) pp. 39-40, and 24.

otherwise indefinable and irremediably subjective mental properties as elements within a common teleological framework, securing a language of universality without necessarily entailing a normative account of aesthetic value.

Are we not, however, by this teleological reframing of aesthetics centred around the idea of pleasure in form as a kind of purposiveness without purpose, landed squarely in the domain of Kantian aesthetics? Certainly, Kantian parallels have proved attractive in recent approaches to the teleological signification of Darwin's aesthetics. For instance, where Winfried Menninghaus has stressed the role of ornamentality in Darwin's aesthetics, he has proposed a model in which 'the Kantian disinterestedness of the aesthetic judgement is [...] turned on its head in Darwin's theory,' with George Levine claiming that 'the Darwinian road to the palace of art replays Kant's notion of purposiveness without purpose.'⁴³ Wherever authors have tried to understand the teleological implications of the fatal doctrine of beauty as it conflicted with functional adaptation in Darwin's theory – 'torn from the fetters of utility, beauty in and for itself alone' – this same intertext has played out again and again, with sexual selection becoming a quasi-Kantian vehicle of aesthetic autonomy: as Ian Duncan has phrased it, 'the condition of autonomy claimed for aesthetic experience in Kant's and Schiller's wake' was recapitulated as 'an outgrowth of the contingent autonomy of sexual selection itself with respect to natural selection.'⁴⁴ Although these accounts have striven to characterise something that I agree is vital for our understanding of Darwinian aesthetics, and whatever the apparent inescapability of the philosophical influence of Kant's *Kritik der Urteilskraft* (1790), these kinds of references to Kant do not, on the whole, appear historically compelling to me, and underline the need for renewed interest in a different tradition. In most respects, the theories put forward by the authors I will analyse conflict with Kant's account of both physico-theology and beauty, or any link between them. Most obviously, for Kant the teleological argument at the heart of natural theology (and natural history) only attains the status of a regulative ideal, taking the form of an *als ob* which disbars teleological reflective judgements from attaining the epistemic security of determinative judgements or the

⁴³ Winfried Menninghaus, 'Biology à la mode: Charles Darwin's Aesthetics of "Ornament,"' *History and Philosophy of the Life Sciences*, 31 (2007), 263-278 (p.266); George Levine, 'Victorian Excess and the Darwinian Aesthetic,' *Victorian Studies*, 62 (2019), 8-31 (p.25). Gillian Beer has used a similar formulation to describe the teleological form of natural selection itself; see Gillian Beer, *Darwin's Plots*, 3rd edn (Cambridge: Cambridge University Press, 2009), p. 81.

⁴⁴ Ian Duncan, 'Natural Histories of Form: Charles Darwin's Aesthetic Science,' *Representations*, 151 (2020), 51-73 (pp.52 & 68).

operation of *a priori* synthetic and analytic cognition. The speculative analogy of design in natural theology is isomorphic with the form of aesthetic judgement as exemplified by the ascription of beauty, and Kant directly critiqued the objective universality of both the argument from design and any ontology of beauty as a subject-independent property of objects, the two cornerstones of the theory of beauty discussed here. So, although common themes will recur on several occasions through my argument, in general I claim there are good reasons to push back against any impulse to closely align the history I will narrate with the legacy of Kant's thought, despite my continued preference for a Kantian vocabulary *sensu lato* in trying to frame the specific issue of a purposeless purpose of design.

However, the reasons for my reticence are in themselves, I hope, highly interesting for some of the ways in which we think about the Kantian legacy in nineteenth century British aesthetics, science and philosophy. Such a legacy will always remain complicated because Kant was read, discussed and transformed within the terms of the anglophone natural theological tradition, and so although Darwin did have some knowledge of Kant's third critique via (among others) Whewell's *History* (1837) and *Philosophy* (1840), he did so in a form that eliminated the distinctive Kantian claim of teleology as only a regulative ideal.⁴⁵ Moreover, as I have tried to capture in the idea of the fatal doctrine inherited from natural theological thought, Darwin was forced to contend with the challenges and cognitive resources of a form of the purposive without purpose that bore no straightforward relationship to Kant's philosophy at all. Even *NT* (1802) evidences the operation of this teleological form, with Paley offering an account of the beauty of animals as a distinct order of purposeless design, 'ornamental', and 'not subservient, that we know of, to any other purpose.'⁴⁶ British natural theology offered an autochthonous theory of purposeless purposes that had, in the historical moment of their formulation, no constitutive reference to Kantian thought.

In this way, resemblances that have been drawn between Darwin's aesthetics and Kant's analytic of the beautiful should be understood, despite themselves, to be revolving around philosophical problems inherited from an overlooked British tradition of natural theology. Ideas or analysis thought in Kantian terms, or attributed to Kant, have lost sight that

⁴⁵ Regarding why this epistemic claim was ontological for Whewell, see Chapter I and II. See also, John Cornell 'Newton of the Grassblade? Darwin and the Problem of Organic Teleology,' *Isis*, 77 (1986), 405-21.

⁴⁶ Paley, p. 214.

these similarities and resonances are more a function of a common European context of physico-theology (and its common problematic of aesthetic teleology) than direct influence.⁴⁷ The authors analysed in this thesis travelled a divergent philosophical road to that of Kant, their theoretical differences reflecting the various possibilities afforded by this shared legacy. Where, for example, Elizabeth Grosz, has explored how ‘sexual selection, as an alternative principle to natural selection, expands the world of the living into the nonfunctional, the redundant, the artistic’ and consequently ‘unhinges the rationality of fitness that governs natural selection,’ renewed historical texture can be given to this and other related conceptual analysis of beauty by coming to understand that this “unhinging” or teleological dislocation was already present in the natural theological authors whose logic Darwin was directly appropriating.⁴⁸

Darwin as (Aesthetic) Teleologist

Let us recognise Darwin’s great service to Natural Science in bringing back to it Teleology: so that, instead of Morphology *versus* Teleology, we shall have Morphology wedded to Teleology.

– Asa Gray, *Nature*, 1874

What you say about teleology pleases me especially, & I do not think anyone else has ever noticed the point. I have always said you were the man to hit the nail on the head.

– Darwin, Letter to Asa Gray, 5th June 1874

Attendant upon the formulation of CROE, I will argue that where aesthetic and teleological questions were inextricable within the framework of the design argument in the 1800s, a new reading of Darwin’s theory of beauty as he utilised these resources provides a new way to understand Darwin’s teleology *in toto*, moving the debate regarding Darwin as teleologist

⁴⁷ For an overview of Kant’s philosophy of natural theology, see John Headley Brooke, *Science and Religion: Some Historical Perspectives* (Cambridge: Cambridge University Press, 1991), pp. 203-209. For Kant’s relationship to physico-theological sources, see, for instance, Johann August Eberhard and Immanuel Kant, *Preparation for Natural Theology*, ed. and trans. by Courtney Fugate and John Hymers (London: Bloomsbury, 2016).

⁴⁸ Elizabeth Grosz, *Becoming Undone* (Durham: Duke University Press, 2011), p. 132.

away from natural selection as its central consideration and towards how Darwin's writing might contain *several interacting teleologies*. Undoubtedly, strong opinions have been voiced for and against Darwin as teleologist, although many of these differences are perhaps resolvable into how we define teleology and what we seek to exclude by this definition. For example, Ospovat has claimed, whatever the formative influence of the adaptationist paradigm of natural theology, that 'Darwin's evolutionary speculations [...] forced him to reject teleological explanation.'⁴⁹ At the other end of the spectrum, James Lennox has argued that Darwin's work relied upon an 'explanatory structure which is at once irreducibly teleological, and at the same time unlike any of the standard forms of teleology in the nineteenth century.'⁵⁰ I will return to Lennox's claim to the uniqueness of Darwin's teleology, but where both Ospovat and Lennox similarly discuss Darwin's teleology in terms of the explanatory power of selection, they reach opposite conclusions, at least in part because Ospovat's understanding of teleology implies direct design in contradistinction to secondary law. This split regarding the basic question – 'Is Darwin a teleologist?' – seems to resolve itself along the lines of whether we see teleology as an ontological claim, or as a regulative claim.⁵¹ In contemporary evolutionary science and philosophy of biology the term 'teleonomy' has been long utilised as a replacement for teleology as a way of capturing the explanatory power of goal-directedness without making any claim to real design, and in a historical mode several authors have steered an analogous middle course, with John Beatty, for instance, arguing that 'Darwin was a teleologist in the most basic sense, in that he understood and explained organic form in terms of its usefulness.'⁵² In short, pretty much every imaginable alternative has been argued, from strong affirmations *pro et contra* to

⁴⁹ Ospovat, p. 33. Many (generally older) approaches have denied any positive role for teleological categories in Darwin's work, but such claims have more to do with the philosophical commitments of authors than sensitive historical analysis. See, for instance, Michael Ghiselin's, account of Darwin's 'metaphysical parody': *The Triumph of the Darwinian Method* (Berkeley, CA: University of California Press, 1969), pp. 131-160.

⁵⁰ James Lennox, 'Darwin was a Teleologist,' *Biology and Philosophy*, 8 (1993), 409-421 (p.418).

⁵¹ See, for instance, John Cornell, 'Newton of the Grassblade?'.

⁵² John Beatty 'Chance Variation: Darwin on Orchids,' *Philosophy of Science*, 73 (2006), 629-641 (p.635). For several landmarks in the formulation of teleonomy, first offered by Colin Pittendrigh in 1957, see Colin Pittendrigh, 'Adaptation, Natural Selection and Behaviour,' in *Behaviour and Evolution*, ed. by Anne Roe and George Simpson (New Haven: Yale University press, 1958), pp. 390-419; Jacques Monod, *Chance and Necessity*, trans. Austryn Wainhouse (London: Collins, 1972); and Ernst Mayer, 'Teleological and Teleonomic: A New Analysis,' in *Methodological and Historical Essays in the Natural and Social Sciences*, ed by. Robert Cohen and Marx Wartofsky (Dordrecht: Springer, 1974), pp. 91-118.

accusations of triviality, or worse still, the reinscription of 'myth' and 'metaphysical delusion.'⁵³

The quantity and contradictoriness of claims regarding Darwin's teleology in the present recapitulates a coetaneous diversity of views, even confusion, regarding Darwin's teleology and its formulation within the period, underlining the need for a return to close historical analysis of debates surrounding Darwin's teleology and its formulation. It is only on this terrain that the importance of beauty for Darwin's teleology itself becomes apparent. As with the representative sample of modern approaches given here, Darwin's own period saw a struggle over whether natural selection implied teleology, and whether this teleology was real or simply explanatory. Darwin's supporters were themselves arrayed on either side of the question, and among those who made major interventions, Haeckel and Huxley took an antiteleological stance, with Asa Gray, in line with his natural theological syncretism, taking up the defence of a teleological view.⁵⁴ Five years after its first appearance, Huxley had written that 'if we apprehend the spirit of the "Origin of Species" rightly [...] nothing can be more entirely and absolutely opposed to Teleology,' yet Asa Gray felt able to pronounce, in diametric opposition to Huxley, that Darwin had 'brought back teleology to natural history' with selective explanations.⁵⁵ As the epigraph to this section attests, Darwin seemed to agree with Gray, and although it seems an unobjectionable baseline that we should understand the historical actors at their word, should we therefore understand that figures as important as Haeckel and Huxley were somehow getting it wrong? ⁵⁶ Although, in some way, they must have been, just how wrong they were turns once more on what it is we consider to be 'teleology,' not just in whether we are positing a regulatory teleology or a real goal-directed rationality informing the natural world, but whether the presiding rationality governing the structure of living beings was utilitarian-functional or *something else*.

There has sometimes been a paucity of views regarding what alternatives teleology implied within the period, with Lennox, for instance, locating the confusion of many in the

⁵³ Michael Ghiselin, 'Darwin's Language may Seem Teleological but his Thinking is Another Matter,' *Biology and Philosophy*, 9 (1994), 489-492 (p.489).

⁵⁴ For an overview of these contrasting responses, see John Beatty, 'Teleology and the Relationship Between Biology and the Physical Sciences in the Nineteenth and Twentieth Centuries,' *Some Truer Method*, ed. by Frank Durham and Robert Purrington, (New York: Columbia University Press, 1990), pp. 113-144.

⁵⁵ T. H Huxley, 'Criticisms on "The Origin of Species,"' *Natural History Review*, 4 (1864), 566-80 (p.569); Asa Gray, *Darwiniana* (New York: Appleton, 1876), p. 357.

⁵⁶ Darwin, Letter to Asa Gray, 5th June 1874.

fact that although ‘Darwin essentially re-invented teleology [...] in a historical context where one's teleological choices were either the goals of goal-directed vital forces or divinely designed adaptation, no one was prepared for Darwin's accomplishment: a selection-based teleology.’⁵⁷ Yet these were not really the only choices that thinkers faced at the time, and years before the publication of *Origin* Huxley's dismissal of teleology was linked to a suspicion of adaptive functionalism in order to prize an *aesthetic* teleology of design.⁵⁸ So, although Huxley might claim by 1864 that a functional teleology of design was ‘false to the fundamental principles of a scientific conception of the universe’, he had moved closer towards this kind of teleology than he had been in 1856, writing that although ‘teleology, as commonly understood, has received its death blow,’ teleological conceptions still did ‘good service’ in keeping ‘striking’ ‘adaptations to purpose’ at the forefront of Darwin's research.⁵⁹ Adaptive purpose or utility *had been* a defunct explanatory paradigm, but was now enjoying its afterlife.

As is apparent in the words of Gray and Huxley, both sides of the debate accepted that some mediate position was achieved by Darwin in *Origin*, although, as Lennox has put it, it remains ‘doubtful, however, that any of those who praised or blamed Darwin for his position on teleology ever worked very hard to see how this reconciliation actually works.’⁶⁰ Certainly, the reconciliation of ‘Morphology wedded to Teleology’ was one of the major theoretical desiderata of the period, and Asa Gray's eirenic formulation of Darwin's teleology was itself something of a commonplace, often attached to the trope of the struggle between Cuvier and Geoffroy at the French Academy of Sciences.⁶¹ Importantly, for any later understanding of how beauty intersects with adaptive teleology, Darwin's theory was read as an intervention (or resolution) in an anterior debate concerning functional teleology versus the purposelessness of ‘Unity of Type’ and transcendental anatomy.⁶² I will return to the significance of these formulations in the second chapter, but, for Gray at least, Darwin's supposed teleological synthesis had vindicated adaptationist teleology against the prevailing

⁵⁷ ‘Darwin was a Teleologist,’ p. 417.

⁵⁸ ‘On Natural History.’

⁵⁹ ‘Criticisms,’ p. 569.

⁶⁰ ‘Darwin was a Teleologist,’ p. 418.

⁶¹ See Chapter II below. Marjorie Greene has explored Darwin's understanding of this division in ‘Darwin, Cuvier, Geoffroy,’ *History and Philosophy of the Life Sciences*, 23 (2001), 187-211.

⁶² See, for instance, William Carpenter, ‘Darwin on the Origin of Species,’ *National Review*, 10 (1860), 188-214.

influence of figures such as Geoffroy or Owen, with natural selection the triumphant ‘restoration of teleology’ opposing the ‘reaction of morphology against “final causes.”’⁶³

Whatever his own intellectual preferences, Asa Gray did at least pay lip service to the divergent and sometimes paradoxical interpretations that Darwin’s adaptationism had attracted, which, as Gray referenced Ernst Haeckel, might equally be understood in terms of a ‘teleology, or rather—to use the new-fangled term—a dysteleology.’⁶⁴ Yet this relationship of teleology to dysteleology within the design argument itself seems to me to be the crux of the issue, and accordingly why “Darwin as Teleologist” has been so confusing both historically and in the present. Although Asa Gray saw Darwinian teleology as a mechanism *of* design, with natural selection acting as the process by which the divinely ordained novel variations were selected and fixed by secondary law, any spontaneous association of an axis of design and teleology over against an axis of natural law and the negation of teleology is, as I will explore, misleading, not because design implies teleology, but because certain authors had actively assumed the position implied by dysteleology: there could be a teleology of design without the adaptive-functionalist ‘Teleology’ dismissed by Huxley.⁶⁵ In a morphological tradition, this might be plainly understood as unity of plan, especially as it bore no relationship to specific teleological considerations of function. Within Cuvierian or Paleyan paradigms – bound to the supremacy of function or utilitarian adaptation – this supplement to ‘Teleology’ took several forms, comprehending not just unity of design or vestigial structures, but variety, beauty and ornament. As I will discuss in Chapter I and II, where beauty was assumed as an end of design, adaptationist teleology and dysteleology went hand in hand. There was, thought in terms of the ‘Utilitarian Doctrine,’ both a teleology and a non-teleology *within* divine teleology, with the design argument deploying several competing teleological models side by side. It was this tension that set the pattern for Darwin’s teleological engagement with aesthetic categories.

That is not to say that the literature is entirely bereft of attempts to make sense of Darwin’s teleology on aesthetic terrain. For instance, Robert Richards has understood this question in terms of his overarching thesis that ‘Darwin’s conception of nature derived, via various channels, in significant measure from the German Romantic movement, and that,

⁶³ *Darwiniana*, pp. 356-7.

⁶⁴ *Ibid.*, p. 378.

⁶⁵ For Gray’s mature formulation of this approach, see *ibid.*, pp. 356-390.

consequently, his theory functioned not to suck values out of nature but to recover them for a de-theologized nature.⁶⁶ Although I am sympathetic towards Richards's overarching image of natural selection as a morally 'redemptive purpose' 'depicted as operating [...] unceasingly, intricately, aesthetically, and teleologically,' where Richards links these teleological themes to a Romantic concept of nature, there is no pressing need to turn towards Kant, Humboldt or *Naturphilosophie* when a ready-made constellation of teleology, beauty and the adaptive economy of nature actually sat much closer to home.⁶⁷ That being said, in an overarching sense Richards is correct and those focussed on anglophone influences have largely missed the importance of aesthetic questions as they intruded within the domain of functional teleology. Although, for instance, David Kohn has accurately grasped the crux of the issue, that 'Darwin's teleology lies, ironically, in the usefulness produced by a purposeless [...] process,' it is crucial to think beyond natural theological teleology as a monolithic structure that only cognised organic form in terms of functional utility.⁶⁸ Darwin's teleology was not just a 'secular utilitarianism' which 'accounts for each adaptation by its functional utility,' but reflected the multifariousness of the natural theological teleology from which it originated.⁶⁹ The authors of the 1830s did not just think in terms of a Paleyan God framed, *pace* Ruse, as the 'supreme industrialist,' but thought through the lens of adaptive utility and the purposeless purpose of beauty or ornament – this was, to reiterate, the dysteleological problematic within functional design.⁷⁰ Following this thread enables us to think an eirenic course between alternatives, as natural theological sources deployed the elements of the logic that Richards identifies as central to Darwin's thought, without, in general, being developed with reference to Romantic or continental influences. The issue of Darwin's aesthetic teleology can be reformulated as the question of what resources the complexities of British natural theological thought from Paley to the 1850s actually afforded Darwin, and how the pre-existing teleological-aesthetic explanatory structure of CROE could be seized from this local tradition and redeployed.

⁶⁶ *Romantic Conception of Life*, pp. 516. See also, Robert Richards, 'Darwin's Theory of Natural Selection and Its Moral Purpose,' in *The Cambridge Companion to the "Origin of Species,"* ed. by Michael Ruse and Robert Richards (Cambridge: Cambridge University Press, 2009), pp. 47-66.

⁶⁷ *Ibid.*, pp. 537-40.

⁶⁸ 'Darwin's Ambiguity,' p. 233.

⁶⁹ 'Darwin's Ambiguity,' p. 233.

⁷⁰ Michael Ruse and Robert Richards, *Debating Darwin* (Chicago: University of Chicago Press, 2016), p. 178.

So, by the measure I attempt to develop in this thesis, the teleological framework developed within modern Darwin scholarship largely fails, whatever position it has taken, and whichever intellectual tradition it has sought to find the keys to the kingdom within. The problem is not the reality of historical confusion regarding Darwin as teleologist, but that authors have failed to sufficiently characterise the philosophical complexity that underpinned this hermeneutic fragmentation, especially regarding the role of aesthetic categories, both in terms of the teleological model by which Darwin was interpreted, but also Darwin's teleology as he appropriated the historical coordinates of natural theology. Beauty was a real purposiveness in nature produced by a real agency; indeed, it became the cornerstone of Darwin's account in *Descent* that the beauty of organisms cannot have been developed for 'no purpose.'⁷¹ Thus, whether we understand natural selection as a real teleology or a regulatory model of functional purposiveness, Darwin still had a dysteleology of real aesthetic purposiveness that ran alongside it, and that, as I will explore, by turns undercut, reinforced, and intersected with this first. So, rather than just searching after the historical synthesis proposed by, *inter alia* Asa Gray, or trying to promote a version of such synthesis in the present, I will argue that Darwin had several teleologies, at the very least two. The question, then, should not be 'was Darwin a teleologist?', which, as far as I am concerned is trivially true, but 'how many teleologies did Darwin have, and how did they interact?'

Where beauty was a concept governed by a teleological framework, and Darwin's work utilised multiple teleological modes, I will argue that we should not understand Darwin as offering a single concept or theory of beauty, but instead providing several definitions of beauty as they aligned with a series of distinctive causal structures or conditions. Different classes of beauty represented distinct ontological kinds as they reflected divergent underlying teleological patterns, from the real beauty produced by sexual selection, through to cases of wholly accidental aesthetic form, like the 'extreme beauty' of nudibranchs, produced by chemical physiology 'independently of any useful end being thus gained, in the complex laboratory of living organisms.'⁷² This typology was already visible when Darwin first offered a detailed public aesthetics in the fourth edition of *Origin* (1866), with his classification of kinds of beauty framed both negatively, as the ontological deflation of certain kinds of beauty,

⁷¹ *Descent*, II, pp. 399-400.

⁷² *Ibid.*, I, p. 323.

but also positively, in giving sexual selection a prominent causal role in producing a class of intrinsically aesthetically purposive forms or structures. As I will discuss in Chapter IV, Darwin had developed this taxonomy of beauty from 1864 onwards as a response to Argyll's critique; considering some aesthetic form real, in the sense that beauty referred to a property selected for and produced by the faculty that appreciates it, but also various accidental forms of beauty that have no selective relationship to the faculty that finds them beautiful, and so only extrinsic aesthetic purposiveness. Examples of accidental beauty provided by Darwin included mathematical or geometric forms, and a kind of biosemiotic beauty, where an aesthetic subject finds a property of an object beautiful, when this property was initially developed as a *sign* by natural selection for some other purpose. Notably, Darwin exemplified flowers and fruits as representative of this kind of beauty.⁷³ Beauty was – variously – a cultural concept, an accidental property of form, a sign of adaptive function, and a mode of genuine aesthetic purposiveness produced by sexual selection.

This teleological definition and classification of kinds of beauty provides the leverage needed to reassess Darwin's aesthetic theory as a whole, showing that beauty was not reducible to sexual selection, nor was sexual selection the sole theory of beauty that Darwin proposed. Most analysis of Darwin's published aesthetics has taken sexual selection as its primary if not exclusive object of enquiry, notably Evelleen Richards' work, which, in its detailed reconstruction of sexual selection, represents the most extensive single extant account of Darwin's aesthetics in the literature. Yet Richards' otherwise compelling reconstruction of this important aspect has the effect of making it seem like sexual selection *was* Darwin's aesthetics or theory of beauty; that sexual selection 'explained [...] beauty and its perception,' or 'explained what natural selection could not: the evolution of beautiful, otherwise useless [...] structures and colours.'⁷⁴ Where Richards' overarching aim is a history of sexual selection, the fact that Darwin had competing and contributory definitions and explanations of beauty is lost. My project, however, is not that of offering another history of sexual selection and its eventual manifestation in *Descent*, but seeks to reemphasise other aspects of Darwin's aesthetics, and, by changing the categories by which we focalise our

⁷³ *Origin*, 4th edn, p. 239.

⁷⁴ Evelleen Richards, pp. xvii and 524.

historical narrative of Darwin's work, showing that a limited view of sexual selection and its development cannot – by itself – be enough to understand Darwin's theory of beauty.

By tracing the thread of dysteleology (both aesthetically and in terms of morphological law) through Darwin's work as a response to natural theological theories of beauty, I hope to unveil not only how Darwin developed a typology of multiple concepts of beauty, but how sexual selection can itself be rethought in terms of this manifold aesthetic teleology. Different kinds of beauty interacted, and sexual selection could itself be causally decomposed and understood as the *conjuncture* of the other kinds of beauty proposed by Darwin. I will argue that we can understand sexual selection in terms of three distinctive causal moments or structures, the constellation of which produce beauty as an intrinsic purposiveness: efficient causes producing variations in form; the inheritance of acquired characteristics (hereditary habitus) adapting taste to those changing forms and producing the aesthetic faculty; the agency of mate-choice supervening upon this faculty as the teleological operation producing intrinsic aesthetic purposiveness. Where, in the very act of mate-choice, the 'æsthetic capacity' was itself 'advanced through exercise or habit in the same manner as our own taste is gradually improved,' sexual selection could then circularly codetermine its own causal conditions.⁷⁵ Mind and forms coevolved as part of a single relational structure: CROE was preserved.

⁷⁵ *Descent*, II, p. 401.

Chapter I

Natural Theological Aesthetics 1800 – 1840

Aesthetic Sense Theory Never Went Extinct

The primary aim of this chapter is the identification, description and analysis of the distinctive natural theological aesthetics that formed the backdrop to Darwin's work, detailing the concepts of correspondency and CROE by providing readings of *NT* and numerous works of the 1830s (the *Bridgewater* authors, John Macculloch's *Attributes* and several further works by William Whewell). Of the protagonists of this chapter, some – Paley and Whewell – are major figures in the intellectual history of the nineteenth century, and some – Thomas Chalmers and John Macculloch – are relatively obscure in our day.⁷⁶ Differences aside, I will argue that a shared logic underpinned the accounts of beauty offered by this cross-section of figures, with the common conceptual foundation of their aesthetics located at the meeting point of the design argument – in the form of a theory of adaptation or contrivance and all its utilitarian teleological baggage – and the aesthetic sense theory of earlier thinkers such as Hutcheson, and, as I will analyse in greater detail, Kames.⁷⁷ I will show how these basic elements remained a pervasive pattern of argument for natural theological authors throughout the early nineteenth century, and there was, for many thinkers, no eclipse of internal sense theory. Indeed, given the increasing ascendancy of an adaptive paradigm between 1800-1830 (exemplified in the idea of correspondency), aesthetic sense theory was provided a new lease of life. Although the vocabulary used to describe aesthetic sense shifted,

⁷⁶ Thomas Chalmers (1780-1847) was one of the most intellectually visible Scottish churchmen of the early nineteenth century – a cleric, natural theologian, economist and professor of theology at St Andrew's University. John Macculloch (1773-1835) was notable in the period as a doctor, chemist, geologist, natural theologian, and friend and correspondent of Walter Scott.

⁷⁷ It has, of course, been argued that Kames was *not* an aesthetic sense theorist. See p. 33 below.

and different theological aspects were brought to the fore, its framework remained discernible.

Notwithstanding its marginal status in contemporary literature, it would be a mistake to think that natural theological approaches to beauty were culturally peripheral in the period itself. As I have mentioned, Benjamin Morgan has argued for the ‘pervasiveness’ of the adaptive logic of natural theological aesthetics, and many of the texts espousing such a theory had huge sales and readership.⁷⁸ Take, for example, the *Bridgewater* treatises, which, considered *en bloc*, were, alongside *NT*, the most influential (if numbers are anything to go by) natural theological texts of the nineteenth century, possessing the largest reading public and outselling any other works of their type. By Johnathan Topham’s calculation, there were at least 60,000 copies of *Bridgewater* treatises in circulation by 1850, and would have taken their place among the most widely distributed texts expounding any aesthetic theory in the mid-nineteenth century (albeit not necessarily under the guise of offering a theory of beauty).⁷⁹ Given the intended division of labour of the *Bridgewater* treatises, only Chalmers’ work, concerning ‘the adaptation of external nature to the moral and intellectual constitution of man,’ possessed the explicit remit within which a theory of beauty fell; however, symptomatically of its importance, many of the other *Bridgewater* authors provide at least some account of beauty or aesthetic pleasure.⁸⁰ The commonality and relative coherence of this aesthetic preoccupation is especially interesting in the case of the *Bridgewater* treatises, works otherwise more notable for their dissimilarities than their unity and marked by ‘such divergences [that] it is little wonder that, as contemporary commentators repeatedly claimed, the authors were not agreed on a common purpose.’⁸¹

Although Paley remained the single most important recent influence on all the writers discussed here, by the 1830s a certain ambivalence had arisen relative to his legacy, manifested not least in a desire to *update* Paley, with the ‘Paleyites’ of the 1830s representing

⁷⁸ Morgan, pp. 36-7.

⁷⁹ Johnathan Topham, ‘Science and Popular Education in the 1830s: The role of the ‘Bridgewater Treatises,’’ *The British Journal for the History of Science* 25 (1992), 397- 430. For general discussion of the Bridgewater Treatises and period sciences, see Johnathan Topham, ‘Paley, Darwin and the Bridgewater Treatises,’ in *Biology and Ideology from Descartes to Dawkins*, ed. by Denis Alexander and Ronald Numbers (Chicago: University of Chicago Press, 2010), pp. 88-114.

⁸⁰ For an account of the authorial selection process and writing of the Bridgewater Treatises see W. H. Brock, ‘The Selection of the Authors of the Bridgewater Treatises,’ *Notes Rec. R. Soc. Lond.* 21 (1966), 162-179.

⁸¹ See Johnathan Topham, ‘“Beyond the “common context”: The Production and Reading of the Bridgewater Treatises,’ *Isis*, 89 (1998): 233-262.

a more intellectually diverse constituency than many have given credit.⁸² For example, the introduction to Roget's *Bridgewater* could praise the 'unrivalled and immortal works of Paley,' while simultaneously aiming to correct a perceived lack of 'unity of design' and 'scientific form' in his writing.⁸³ In a different intellectual key, Chalmers characterised Paley as 'effective and able in his demonstrations of the natural,' but 'meagre in his demonstration of the moral attributes.'⁸⁴ For Chalmers, a gap remained in the natural theological market that could be remedied by the expansion of natural theology to 'moral attributes,' encompassing not only ethical considerations, but political-economic and aesthetic domains. This claim was not, as should become clear, entirely true, given Paley's own discussions of beauty, but the texts of the 1830s certainly saw a renewed focus upon aesthetic questions. So, rather than simply displacing Paley to recover the importance of other thinkers, my goal is to offer a more nuanced perspective regarding his consequence, analysing Paley's work in the light of his own physio-theological forebearers – including those that Darwin read – along with his transformation by later writers.

Aside from the immediate context of Darwin, this labour has several important ramifications on its own account, necessitating a change to some of the ways in which the history of aesthetics has been commonly narrated regarding the transition between the eighteenth and nineteenth centuries, particularly the role of aesthetic sense theories and their purported demise with the advent and declared ascendancy of associationism. Peter Kivy's *Seventh Sense* is exemplary in this regard, as, whilst giving the fullest existing analysis of Hutcheson's argument for an internal sense of beauty and its ramifications for eighteenth-century aesthetics and beyond, Kivy also argues that later 'associationism was instrumental in rendering obsolete' aesthetic sense theory, locating the 'downfall of [...] internal sense aesthetics' in the figures of Alison and Stewart, who, between them (and others) 'laid the ghost of Hutcheson and the sense of beauty to rest.'⁸⁵ That even the author who has provided the most extensive analysis of the origins of anglophone aesthetic sense theory has argued that associationist aesthetics laid it to rest might give us pause for thought before asserting that its influence hadn't wholly waned, but as I will show, amongst many authors sense theory

⁸² Adrian Desmond, *Politics of Evolution* (Chicago: University of Chicago Press, 1989), p. 111.

⁸³ Peter Roget, *Animal and Vegetable Physiology Considered with Reference to Natural Theology*, 2 vols. (London: William Pickering, 1834), 1, p. ix.

⁸⁴ Chalmers, 1, p. 102.

⁸⁵ Peter Kivy, *The Seventh Sense*, 2nd edn (Oxford: Oxford University Press, 2003), pp. 182 and 192.

remained alive and well. Indeed, for some writers (i.e., Chalmers and Macculloch) the project of natural theological aesthetic sense theory was specifically framed as a debate *against* the pre-eminence of association as the source of our experience and understanding of beauty. For these authors, the ultimate explanation of beauty was teleological, grounded by the presumption of the adaptative design of our sensorium and allied faculty for the appreciation of beauty to the objects in the world they were destined to discover. Although there has never been a denial of the enduring influence of Hutcheson in a more general sense, seen, for example, by Peter de Bolla as having provided the conceptual foundations of modern aesthetics as a kind of knowing and therefore, in the achievement of this reformation, retaining its relevancy into the present, in this chapter I will show how the philosophical claim of a facultatively distinct sense of beauty and its proper objects remained central to a broad selection of authors offering a theory of beauty and its pleasures during the 1830s and beyond.⁸⁶

However, this historical relationship is more involved than any simple genetic account of how nineteenth century natural theological thought availed itself of an unrelated aesthetic theory, as aesthetic sense theory was, in substantive but partially unformulated ways, always-already bound to natural theological patterns of explanation. Recently, Simon Grote has argued that Hutcheson's and Baumgarten's formative achievements unfurled in parallel from a common European tradition of natural law theory and physico-theology, where 'drawing on long traditions of reflection upon the nature of beauty and moral obligation' both Baumgarten and Hutcheson, in their own ways, 'proposed that contemplating beauty in works of art and in the natural world, independent of any revealed knowledge of God or of divine law, could lead the contemplator to virtue.'⁸⁷ A nascent aesthetics and the ongoing proliferation of natural theological writing in the early 1700s were allied projects. Kivy was himself well aware of the theological interest of Hutcheson's *Inquiry*, and given the length Hutcheson devoted to the question of divine design, conceded that we may well 'conclude that for Hutcheson the most interesting and compelling aesthetic problems were theological ones,' with the 'a posteriori proof' of natural theology (the argument from design) reframed

⁸⁶ Peter de Bolla, 'The Invention of Concepts: Sense as a Way of Knowing According to Francis Hutcheson,' *Études Anglaises*, 66 (2013), 161-70.

⁸⁷ Simon Grote, *The Emergence of Modern Aesthetics* (Cambridge: Cambridge University Press, 2017), p. 12.

as an argument regarding beauty; that ‘an aesthetic universe demands a rational creator.’⁸⁸ Certainly, Kivy has identified in Hutcheson’s work the fundamentals of the argument that would later resurface in writers from Paley to the *Bridgewater* authors, that ‘the only explanation for the congruence of our taste with our environment that is probable enough to command assent is an explanation in terms of a rational agent who fashioned this congruence [...] that is, God.’⁸⁹ However, although Hutcheson’s *Inquiry* was, as Kivy put it, inextricably linked to this project of ‘aesthetic theology,’ Kivy did not pursue its historical implications at great length, as, in his words, ‘they are the least likely to arouse curiosity of any other kind than the antiquarian.’⁹⁰

Others, for instance George Dickie, have gone a step further, reading Hutcheson’s *Inquiry* fully beyond its theological ramifications to the point of claiming that Hutcheson’s ‘arguments for his theory of taste are independent of his theology.’⁹¹ Regardless of any specific disagreement with Dickie’s analysis of Hutcheson et al., his account is symptomatic of the problem of eliminating the historical legacy of natural theology in our analysis. When Hutcheson is shorn of all theological context, it is no wonder that the historical trail runs cold and earlier currents of aesthetic sense theory apparently disappear moving forwards into the nineteenth century: intellectual and philosophical historians simply haven’t been looking in the right places.⁹² In this chapter I aim to redress the balance, and where natural theological theories of beauty can be shown as exerting a continued influence during the nineteenth century, it should become demonstrably clear that a fundamentally incomplete narrative has been formulated and regularly relayed in the history of aesthetics; that the end of Dickie’s ‘century of taste’ represented the end of the philosophical and historical relevancy of aesthetic sense theories (‘a decisive shift of momentum’ as Costelloe has phrased this narrative).⁹³ We can reassess the historical fate of aesthetic sense theory by recovering and

⁸⁸ Kivy, pp. 111-112.

⁸⁹ Ibid., p. 113.

⁹⁰ Ibid., p. 111.

⁹¹ George Dickie, *The Century of Taste*, (Oxford: Oxford University Press, 1996), p. 23. See also pp. 121-122.

⁹² I take Guyer’s *History of Modern Aesthetics* as a further example of this trend, where, despite the breadth and depth of Guyer’s analysis, the fate of eighteenth-century internal sense theory is largely absent moving into the nineteenth century, and, accordingly, the idea of a widespread natural theological tradition of aesthetic theory isn’t pursued at all. See Paul Guyer, *A History of Modern Aesthetics*, 3 vols (Cambridge: Cambridge University Press, 2014).

⁹³ Timothy Costelloe, *The British Aesthetic Tradition: From Shaftesbury to Wittgenstein* (Cambridge: Cambridge University Press, 2013), p. 131.

extending its theological interest, and by offering readings of both canonical texts and those that have been largely ignored by historians, I will aim to show that the posit of an *sui generis* sense of beauty wasn't simply eclipsed by associationism and never disappeared. A full history of natural theological theories of beauty in the intellectual *longue-durée* – from Cicero's *De Natura Deorum* to Walter Charleton's *Darknes of Atheism* and Paley's *Natural Theology* – remains to be written; my aim here is only to adequately capture the outlines of its late flowering.⁹⁴

For these more modest purposes, there is no better way of tracing the contested history of aesthetic sense, natural theological design and the narrative of association's ascendancy than the work of Henry Home, Lord Kames (1696-1782). This might appear surprising, as it has been regularly argued, notably by Kivy, that Kames *wasn't* an aesthetic sense theorist, proposed instead, in the words of Costelloe, as a 'founding father of associationist aesthetics.'⁹⁵ However, association and aesthetic sense are not necessarily antithetical, and I will argue that we should reconsider Kames as a sense theorist whatever the role of association in his writing. Tellingly, there is good reason to do so on the same theological grounds by which Hutcheson – for whom only the posit of 'choice in the Supreme Agent who constituted our sense' could characterise the link between a sense of beauty and a world created to be beautiful – is described as an aesthetic sense theorist.⁹⁶ My reading here is based not on Kames' *Elements of Criticism* (1762), but his later *Sketches of the History of Man* (1774), principally because Kames' approach to aesthetic questions in this latter work most clearly foreground what might not always be entirely clear in the *Elements*, that the fundamental basis of any approach to questions of beauty or the aesthetic more generally must be in some way founded on a theory of an inborn faculty for the appreciation of these aspects of creation.⁹⁷ Kames remained well-read through the 1800s, and as Guyer has noted (without, it must be said, detailing precisely how), the 'endurance of Kames' work well into the nineteenth century' through continued republication and readership allowed for continuing influence.⁹⁸ Indeed, one of the interests of the *Sketches* is that it was read by

⁹⁴ See, for instance, Cicero, *On the Nature of the Gods*, trans. by H. Rackham, Loeb Classical Library vol 268, (Cambridge: Harvard University Press, 1933), pp.207-223; Walter Charleton, *The Darknes of Atheism Dispelled by the Light of Nature* (London: 1652), pp. 168-9.

⁹⁵ Kivy, pp. 230-236; Costelloe, p. 96.

⁹⁶ Hutcheson, p. 92.

⁹⁷ Henry Home, *Sketches of History of Man*, 2 vols (Edinburgh: Creech, 1774).

⁹⁸ *History of Modern Aesthetics*, I, p. 180.

Darwin, and so provides another determinable source for how some of these important aesthetic coordinates may have reached his work.⁹⁹

As Kames plainly stated the foundation of his aesthetics in the *Sketches*, taste is ‘the sense by which we perceive beauty and deformity in objects,’ or, alternatively, ‘knowledge of what is agreeable and disagreeable in objects [...] [is] derived from the sense of beauty.’¹⁰⁰ For Kames, this sense of beauty was understood as analogous to a ‘moral sense,’ predicated upon the dual condition of being both innate (‘born with us’) as well as being tutored in the life history of an individual through experience.¹⁰¹ Beauty and morality were bound to a common process of *paideia*, and through progressive ‘cultivation’ the ‘taste goes hand in hand with the moral sense in their progress towards maturity,’ a commonality underpinned by the guarantee that ‘both ripen equally by the same sort of culture.’¹⁰² The ‘perfection’ of this inborn sense of beauty was designated ‘delicacy of taste;’ an achievement, after the proper honing of our faculties, that would make us capable of ‘perceiving the minutest differences between beauty and deformity.’¹⁰³ In the same way that all our potentialities must be practiced or exercised, taste itself, although given to us facultatively, must be refined to realise its fullest power. Accordingly, whatever the universality of our intuitive capacity to perceive beauty, individual differences of taste could be understood. It was on these grounds (among others) that a work such as the *Elements of Criticism* was necessary, with Kames referring his reader to this earlier work as offering specific examples of causes that ‘retard taste in its progress towards maturity.’¹⁰⁴ By this logic, other plausible aesthetic first-principles, foremost amongst them association, had meaning within the context of a sense theory. Although they could provide a model for differences of taste or describe aspects of the process of aesthetic *paideia*, they remained subordinate to an ultimate destiny only explicable by an overarching teleological structure. Such a structure could only be secured by the posit of an inborn aesthetic nature or sense, and so although aesthetic sense and associationism could be harmonised, this was only possible when these other principles were

⁹⁹ See CUL-DAR119.12v.

¹⁰⁰ *Sketches*, I, p. 106 and II, p. 102.

¹⁰¹ *Ibid.*, I, p.106.

¹⁰² *Ibid.*, I, p. 107.

¹⁰³ *Ibid.*, I, p. 106.

¹⁰⁴ *Ibid.*, I, p. 116.

subordinated to an originary sense of beauty. We became, through *paideia*, what we somehow always were.

Where, in the perception of beauty, we are occupied by properties of objects that we cannot ‘discover [...] by any argument or process of reasoning,’ one major ramification of Kames’ postulate of an aesthetic sense was that it rendered pleasure both unanalysable and irreducible.¹⁰⁵ Kames’ appeal was to a sense and its *qualia* that couldn’t be translated into an epistemic form, or made equivalent to any other property or mode of experience. Having been made non-cognitive, the existence of beauty or an aesthetic sense could not be argued for rationally (we cannot make a reasoned claim that commands assent, either for the existence of a sense of beauty or for the properties of objects within its purview) but was present to us phenomenologically as the condition of possibility of experience. It was in these fundamental respects once more analogous to ‘moral sense,’ and thought through its terms:

There is no cause for doubting the existence of the moral sense, more than for doubting the existence of the sense of beauty, of seeing, or of hearing. In fact, the perception of right and wrong as qualities of actions, is no less distinct and clear, than that of beauty, of colour, or of any other quality; and as every perception is an act of sense, the sense of beauty is not with greater certainty evinced from the perception of beauty, than the moral sense is from the perception of right and wrong.¹⁰⁶

Human beings possess a series of intuitive faculties, each providing a special mode of ‘perception’ the truth of which can only be given through the very ‘act of sense’ they are the capacity-for. Theories of aesthetic and ethical perception succeed or fail together. However, despite this common threshold of proof, no proof of their existence could be forthcoming, as Kames’ argument was that the perception of beauty was both undeniable but likewise ultimately unanalysable *qua* sense. Instead, through an appeal to a capacity for perception orthogonal to reason, Kames made these faculties epistemologically prior to a scepticism that would claim to doubt them: we would have to use the sense of beauty to even doubt the sense of beauty. The only authentic dissent could be made by one who cannot perceive beauty, but *eo ipso* dispute would be rendered futile. As Kames had already put it – ‘supposing these qualities to be hid from our perception, in vain would we try to discover them by any

¹⁰⁵ Ibid., II, p. 247.

¹⁰⁶ Ibid., II, pp. 249-50.

argument or process of reasoning: the attempt would be absurd; no less so than an attempt to discover by reasoning colour, or taste, or smell.’¹⁰⁷

Yet, where beauty was understood as an unanalysable perceptive quality of an object, Kames’ account ran afoul of the problems of post-Lockean empiricism. If beauty was rendered a ‘secondary quality [...] perceived intuitively,’ depending ‘on the percipient as much as on the object’ and ‘being nothing when not perceived,’ and no common rational or communicative framework could decide on the reality of beauty beyond the performance of sense itself, the only way to guarantee the aesthetic qualities of objects was to transcendently guarantee the correlation between the sensorium to the world through the promise of a *designed* faculty of taste.¹⁰⁸ Thus, Kames moored aesthetic perception by taking refuge in the ultimate explanation that the faculty of aesthetic ‘sense’ was one which ‘the deity has bestowed on man.’¹⁰⁹ As with ‘right or wrong,’ properties of ‘beauty and ugliness’ still existed within the ambit of universality and normativity, as design – through the provision of both faculty of sensation and its objects – acted as the ultimate guarantee of the coherence of aesthetic perception in the last instance.¹¹⁰ The provision of design in Kames’ argument matched Hutcheson’s characterisation of the guarantee that a sense of beauty must correlate with beautiful objects in the world, that ‘since the divine Goodness [...] has constituted our Sense of Beauty as it is at present, the same goodness might determine the Great Architect to adorn this vast Theatre in a manner agreeable to the Spectators.’¹¹¹

However, this same gesture towards design to secure aesthetic experience was also the source of considerable tension in Kames’ account, as it pointed towards a split between reason and aesthetic sense that was the very function of our sense being adapted-for objects without reference to our intellectual capacity. Take, for instance, the following passage from Kames’ *Essays on the Principles of Morality and Natural Religion* (1751), which, as a work written within the generic tradition of Anglophone physico-theology, helps underlines how Kames’ claims of aesthetic sense directly related to the history of natural theological discourse:

¹⁰⁷ Ibid., II, p. 247.

¹⁰⁸ Ibid., II, p. 246.

¹⁰⁹ Ibid., II, p. 247.

¹¹⁰ Ibid., II, p. 247.

¹¹¹ Hutcheson, p. 93.

The perception we have of any object, as an effect, includes in it the feeling of a cause proportioned to the effect. If the object be an effect properly adapted to some end, the perception of it necessarily includes an intelligent designing cause. [...] Not is it in our power, by any sort of constraint, to vary these feelings, or to give them a different modification from what they have by nature. It may be in our power to conceive, but not in our power to believe, that a fine piece of painting, or a well wrote poem, or a beautiful piece of architecture, can ever be the effect of chance, or of blind fatality. [...] We are so constituted that we can entertain no doubt of this, if we would.¹¹²

The claim of design in the world had a compositional logic, and *because* of the irreducibility of beauty to reason, Kames was able offer a specifically aesthetic design argument. Although it was possible, faced with a beautiful object, to conceptualise an absence of compositionality rationality motivating its form, such an act of reason could never command assent, because we are also possessed of an aesthetic intuition of design ‘proportioned to the effect.’ Our aesthetic faculties were ‘constituted’ such that the perception of beauty was necessarily the perception of an ‘intelligent designing cause,’ and so circularly – beyond any claim of reason – aesthetic sense grounded certain knowledge of a teleological architectonic underpinning organised form.

Precisely here, where design appears to throw reason and sense into conflict, the question of a key category is foregrounded: what does it mean to be ‘adapted’? Firstly, for Kames, we have intuitions about adaptation as necessitating design. In this case, where any object is brought about to ‘some end’ – the fittedness of means to *telos* – we can assign intelligent purpose to it. Teleology, aesthetic or otherwise, implies design. However, where these feelings are themselves an aspect of our ‘nature’ or constitution fitted for some purpose, an intuition about adaptative design that commands our assent to the reality of design is itself brought within the same form of thought. We are adapted, through aesthetic sense, to know adaptation as a *rational* form of thought – the ‘effect properly adapted to some end’ – and, moreover, in such a way that our reason cannot escape knowledge of design. The apparent conflict between sense and intellect (belief and conception) is revealed as the division of labour that keeps sceptical reason in check. So, adaption already points towards a.), the achievement of teleological finality by the fittedness of objects; b.), the fittedness of mind to objects (and *vice versa*); c.), the interrelation of mental faculties.

¹¹² Henry Home, *Essays on the Principles of Morality and Natural Religion* (Edinburgh: Fleming, 1751), pp.295-7.

However, beyond this synchronic gloss, Kames' discussion of aesthetic sense in *Sketches* has already implied a further meaning of adaptation. For Kames, the innate aesthetic sense was subject to a process of *paideia*, by which we came into the full use of what we already possessed facultatively. Adaptation as mutual fittedness between the mind and the world could mean a static adaptation, set for all eternity within design, but might also mean adaptation as a temporal and dynamic process of shaping or transformation relative to an environment. Kames found a way of unifying aesthetic sense with other modes of thought through this conceptual equivocation, with the associationism that historians have claimed for Kames readily synthesisable with sense theory by the recognition that an adaptive habit of thought can combine both innatism and a dynamic process of taste formation.

The difference between a synchronic and diachronic understanding of adaptation (and design) will play out repeatedly in the work of the authors I discuss, but moving forward to Paley and the authors of the 1830s, Kames' account of a specifically aesthetic adaptation brings to the fore the key teleological question that would occupy natural theological theories of beauty in the nineteenth century. In Kames' *Essays* there was a tension between aesthetic intuition and reason, which might be understood to map onto the difference between an intuitive approach to form as aesthetic, and more cognitive approach to form in terms of ends-based rationality. Although Kames did not explore the possible difficulties this distinction entailed, the difference between these modes of evidencing design had a long history within physico-theological discourse, eventuating, by the time of *NT* increasing problems of logical consistency. Take, for instance, the following passage from Boyle's *Usefulness of Experimental Philosophy* (1663), which given Paley's later use of the watchmaker analogy, provides a useful conceptual bridge between the two:

as when some Country Fellow looks upon a curious Watch, though he may be hugely taken with the rich Enamel of the Case, and perhaps with some pretty Landskip that adorns the Dial-plate; yet will not his Ignorance permit him so advantageous a Notion of the exquisite Makers skill, as that little Engine will form in some curious Artist, who besides that obvious Workmanship that first entertains the Eye, considers the exactness, and knows the use of every Wheel, takes notice of their proportion, contrivance, and adaptation altogether, and of the hidden Springs that move them all.¹¹³

¹¹³ Robert Boyle, *Of the Usefulness of Experimental Philosophy* (Oxford: Hall, 1663), p. 54.

Boyle was keenly aware of the difference between a rational appreciation of *technē* – of ‘contrivance’ or ‘adaptation’ known as a functional purposiveness – and an intuitive aesthetics of ‘obvious’ and ornamental properties. For Boyle, the hierarchy of these kinds of knowledge was clear, with the imagined ‘Country Fellow’ unable to formulate the adequate representation of ‘exquisite [...] skill,’ available only those who have the knowledge to think as an ‘Artist.’ Where knowledge granted a higher aesthesis of the artefact, Boyle introduced a split within the design argument between rational and intuitive proofs. However, at least in Boyle’s formulation, design still cohered, because this distinction between modes of access to the artefact was itself an of adaptation between the objects of the world and the differing minds that would experience it: although only ‘true Philosophers are sharp-sighted enough to discern’ those deeper, intellectual signs of adaptation discovered through scientific endeavour, the aesthetic adaptation between the universe and mind was universally accessible, so that ‘in the World [...] every Peruser may read the existence of a Deity, and be in his degree affected with what he sees.’¹¹⁴

As I will now explore, if Boyle’s understanding of design was able to contain this division, Paley’s deployment of the watchmaker in *NT* was not. Paley made knowledge of *technē* an intuition of functional purposiveness in the same way that he deployed aesthetic sense theory as an intuition of functionless purpose, and so these two distinctive teleologies were granted the same epistemic status, despite – as Paley was at pains to spell out – only functional adaptation sanctioning the inference of design. Where Paley approached structures and beings marked by beauty, the teleological scheme of utilitarian contrivance no longer applied, and Paley was forced to theorise a second teleology responsible for aesthetic form. Through the provision of a supplementary theory of aesthetic purposiveness, the Paleyan design argument lost its coherence. Tracing the consequences of this development, I will then turn to several writers of the 1830s and explore the concepts of correspondency and CROE as they responded to the changing teleological implications of design. First, correspondency as it was developed in Whewell’s writing; second, CROE as it was exemplified in the work of John Macculloch and Thomas Chalmers.

¹¹⁴ Ibid., p. 54.

William Paley's Second Teleology

In this section I explore William Paley's theory of beauty and the posit of intrinsic aesthetic ends within nature as they represented a teleological dilemma for the argument from design: can a functional rationality offer adequate resources for measuring the aesthetic as a mode of purposiveness irreducible to utility? Famously, Paley's *Natural Theology* opens with the thought experiment of a watch discovered on a heath. Paley's argument has been rehearsed in detail many times, so for brevity's sake the most important feature of the exemplum that prefaces *NT* is that we are able to discern design or purpose empirically: 'for this reason, and for no other [...] that, when we come to inspect the watch, we perceive (what we could not discover in the stone) that its several parts are framed and put together for a purpose.'¹¹⁵ The general form of the Paleyan design argument relies upon the inductive/abductive 'inference' to best explanation that for particular kinds of being we are sanctioned in moving from the appearance of 'mechanism' (i.e. the technical object) to the supposed necessity of its 'maker' (i.e. *technē*).¹¹⁶ Paley's fundamental position was that 'contrivance must have had a contriver, design, a designer,' with 'atheism' framed as the absurd positing of 'contrivance, but no contriver; proofs of design, but no designer.'¹¹⁷

However, in a gesture that will only later reveal its importance, where Paley linked this immediate knowledge of design to visible adaptation or contrivance, he did so whilst explicitly linking them to the *affect* of the imagined observer. Paley phrased the cornerstone of his argument in terms of an admiration or enjoyment, that each evidence of 'intention and art' in objects stands to 'increase [our] admiration of the contrivance, and [our] conviction of the consummate skill of the contriver.'¹¹⁸ Contrivances were objects of appreciation, and that appreciation was fundamental to our intuition of design, with the intricacy of artefacts correlating with our awe at, and knowledge of, their designer. Paley's wanderer on the heath was a perceptive being whose 'admiration of the contrivance' was the subjective corollary of the object which displays purposiveness of form, and this affective complement was expressed throughout *NT* in the attribution of other aesthetic properties to functional

¹¹⁵ Paley, p. 2. For an overview of Paley's argument, see Victor Nuovo 'Rethinking Paley,' *Synthese*, 91 (1992), 29-51.

¹¹⁶ Paley, p. 3.

¹¹⁷ *Ibid.*, pp. 14 and 17-18.

¹¹⁸ *Ibid.*, pp. 9-10.

adaptation, including, most importantly for my purposes, beauty; predicated, for example, of the articulation of the ribs as a ‘simple yet beautiful mechanical contrivance’ or the reciprocal adaptation of plants and atmosphere described as a ‘beautiful and wonderful oeconomy.’¹¹⁹ Paley’s argument was founded on an aesthetic appreciation of function, with Boyle’s distinction between knowledge and intuition transfigured – even the ‘Country Fellow’ could now know contrivance.

As will be clear from Boyle’s own disquisition on the watch as an ontological analogy of design, whatever the importance of Paley for nineteenth-century British natural theological thought, he was by no means the originator of the arguments and rhetoric that *NT* relied upon. Indeed, where Paley leveraged an artefactual model to understand organic form, Jessica Riskin has observed that ‘by the time Paley repeated these arguments, they had the feel of truisms.’¹²⁰ Lorraine Daston has explored how natural theological argument came to this truistic consistency during the eighteenth century, a period in which the ‘argument from design’ became ‘less an argument from evidence than an experience of self-evidence’ or ‘mode of cultivated experience.’¹²¹ Where ‘the enchained argument from design’ became ‘the immediate intuition of design,’ possessed of ‘the force of direct perception,’ this perception nested within itself a multiplicity of discrete values, captured by Daston in terms of ‘utility’ ‘as a compound of norms,’ comprehending the ‘good, the beautiful and the useful,’ and ‘simultaneously moral, aesthetic, and economic.’¹²² Yet the frame of utility, combining within itself this heterogeneity of values, was inherently unstable. As Guyer has explored, the link between utility and beauty was often fraught in eighteenth-century aesthetic theory, and in *NT* beauty was defined as a second and teleologically distinctive order of purposiveness, ‘not subservient, that we know of, to any other purpose.’¹²³ Paley’s work saw a stratification of functional and aesthetic teleology, and where once there had been an uneasy alliance of beauty and utility in natural theological discourse, in *NT* we can chart the fracturing of this settlement. Paley’s use of the philosophical terms of aesthetic sense theory pointed towards a new way of understanding the teleology of design.

¹¹⁹ Ibid., pp. 114 and 402.

¹²⁰ See Jessica Riskin, *The Restless Clock* (Chicago: University of Chicago Press, 2016), pp. 238-50.

¹²¹ Lorraine Daston, ‘Attention and the Values of Nature in the Enlightenment,’ *The Moral Authority of Nature*, ed. by Lorraine Daston and Fernando Vidal (Chicago: University of Chicago Press, 2003), pp. 100-127 (p. 101).

¹²² Ibid., p. 126 and 119.

¹²³ Paul Guyer, ‘Beauty and Utility in Eighteenth-Century Aesthetics,’ *Eighteenth-Century Studies*, 35 (2002). 439-453; Paley, p. 214.

But what was the accommodation that Paley's second teleology broke apart? For centuries, contrivance and adaptation, the foundations of the design argument, had been constellated with categories of aesthetic appreciation.¹²⁴ Take, for example, several well-known seventeenth-century authors that Darwin himself read from 1838-39, John Ray and Thomas Browne.¹²⁵ In *The Wisdom of God* (1691) Ray could write that there was 'no greater' or 'more palpable and convincing Argument of the Existence of a Deity' than the 'excellent Contrivance for Beauty, Order, Use, &c.' which characterises the 'Ends and Uses of all the Parts and Members of this stately Fabrick of Heaven and Earth.'¹²⁶ At an earlier juncture, Browne's *Religio Medici* (1642) would claim that 'there is a generall beauty in the works of God' as 'all that he had made was good, that is, conformable to his will, which abhors deformity, and is the rule of order and beauty,' with the premise underlying this universal beauty of nature residing specifically in divine *technē*; that 'all things are artificiall, for nature is the Art of God.'¹²⁷ Natural objects and artefacts were claimed as the same kinds of being.

Certainly, Paley's approach to the 'Art of God' was to characterise contrivance and adaptation not only as visible properties ripe for inductive inferences ('for in the watch which we are examining are seen contrivance, design; an end, a purpose; means for the end, adaptation to the purpose'), but an ontological index by which organisms were themselves machines.¹²⁸ As Paley was at pains to spell out, 'there is mechanism in animals [and] this mechanism is as properly such, as it is in machines made by art.'¹²⁹ So, where the interest of Paley's engagement with aesthetic categories is considered on the level of the contrivance and our admiration of it, Paley's thought doesn't necessarily complicate any narrative of utility as 'compound of norms.' There is, however, a problem, as where Paley took up aesthetic form as a direct object of design, our admiration of the beautiful contrivance could not remain divorced from the ontological claims that maintained the power of the design argument. *NT* offered a theory of beauty, with Paley arguing that beauty was a 'general

¹²⁴ For the role of the aesthetic and material practices of the early modern period in the formation of this ontological analogy, see Lorraine Daston and Katherine Park, *Wonders and the Order of Nature* (New York: Zone Books, 1998), pp. 255-301.

¹²⁵ CUL-DAR122.270 and CUL-DAR123.53e.

¹²⁶ Ray, pp. 11-12.

¹²⁷ Thomas Browne, *Religio Medici* ([London]: for Andrew Crooke, 1642), pp. 28-29.

¹²⁸ Paley, p. 16.

¹²⁹ *Ibid.*, p. 88. Regarding the ontological analogy of organisms and machines in Paley's work, see Neal Gillespie, 'Divine design and the industrial revolution: William Paley's abortive reform of natural theology,' *Isis*, 92 (1990), 214-229.

property of animal forms' which became in itself 'a strong indication of design, and of a design studiously directed to this purpose.'¹³⁰ Yet how to disentangle a theory of beauty as a unique teleological form from the aesthetics of the functional contrivance that was otherwise central to Paley's project, a project founded – as Gillespie has phrased it – on the 'realization of the identity of mechanical principles in both man-made machines and nature'?¹³¹

As might be expected given the functional foundation of Paley's teleology, Paley's first attempt at explaining beauty as 'a general property of animal forms' sought to discover a reason on the register of utility.¹³² Thus, by this 'general property' of beauty Paley did not mean a 'relative beauty' thought in terms of a human aesthetic judgements regarding form, but an objective property possessed by animals and known by animals, in which a 'provision is made, in the body of almost every animal, to adapt its appearance to the perception of the animals with which it converses.'¹³³ So, at least initially, this beauty could be recuperated as purposive relative to sociality and reproduction, with animals appreciating the beauty of their conspecifics as a spur to reproduction, similarly to the operation of beauty in human sexual desire. *This* finality of beauty still cohered with utility. However, as implied by the very category of 'relative beauty,' the human observer was capable of a further, generalised appreciation, through which beauty was not only enjoyed without any further end, but was understood – to reiterate – as 'design studiously directed to this purpose.'¹³⁴ Beauty was not just a mode by which we experience functional purposiveness in the 'beautiful contrivance' etc., but was itself an intrinsic purposiveness. Indeed, once Paley claimed to identify beauty as a mark of contrivance for its own sake 'with respect to *any* of the productions of nature,' he felt able to 'refer, with a considerable degree of probability, other particulars to the same intention.'¹³⁵ For Paley, these included a myriad of forms in the natural world: the 'tints of flowers, the plumage of birds, the fur of beasts, the bright scales of fishes, the painted wings of butterflies and beetles, the rich colours and spotted lustre of many tribes of insects.'¹³⁶ Paley identified a distinctive order of beauty within the natural world that demanded an explicit theoretical account of both aesthetic properties *and* our appreciation of them – two

¹³⁰ Paley, pp. 212-213.

¹³¹ Gillespie, 'Divine Design and the Industrial Revolution,' p. 214.

¹³² Paley, p. 212.

¹³³ *Ibid.*, p. 212.

¹³⁴ *Ibid.*, p. 213.

¹³⁵ *Ibid.*, p. 213.

¹³⁶ *Ibid.*, pp. 213-14.

polarities of a relationship that must itself be a product of design. The 'divine Art' was no longer simply *technē*, but possessed of its own unique ontological complexion.

In order to secure beauty as a unique mode of purposiveness *against* utility, Paley's strategy was to contain the possible critique of associationism; the 'ground [...] of objection [...] that there is no such thing as beauty at all: in other words, that whatever is useful and familiar comes of course to be thought beautiful; and that things appear to be so, only by their alliance with these qualities.'¹³⁷ Aesthetic qualities existed in excess of utility (the 'useful'), even if utility was associated with beauty *post hoc*, and so although Paley did not seek to deny that that beauty can be 'modified by habit, by fashion, by the experience of advantage or pleasure, and by associations arising out of that experience,' he made such aesthetic association a subsidiary mechanism that cannot explain our 'native capacity of perceiving beauty.'¹³⁸ Thus, despite Paley's reliance upon an aesthetics of the contrivance, beauty and utility came apart at the seams, with any association of function with the aesthetic a secondary modification of what was, in its originary meaning, an adaptation of aesthetic sense to its proper objects. Indeed, beauty was itself known intuitively 'as a final cause' in nature irrespective of any 'concession' to association or cultural paideia, with Paley's argument founded, like Hutcheson or Kames before him, on the simple facticity that we 'possess a sense of beauty,' and that whatever the difficulties of knowing how a sense of beauty exists, 'it in fact exists.'¹³⁹ In the same way that functional utility was known immediately and intuitively, we come to know the facticity of this subjective sense by its immediate relationship to its properly objects, as 'things are not indifferent to this sense: all objects do not suit it: many, which we see, are agreeable to it; many other disagreeable.'¹⁴⁰ The question of aesthetic design was therefore rephrased in terms of a 'congruity' between a sense and its proper object; a 'congruity to enable any particular object to please.'¹⁴¹

So, the primary logical requirement Paley set for understanding aesthetics in natural theological terms was 'congruity,' the same fundamental logic of Hutcheson's 'theatre,' and, looking forward to the next section, the adaptive form of thought that would be universalised in Whewell's concept of 'correspondency.' Paley expanded upon congruity as the foundation

¹³⁷ Ibid., p. 215.

¹³⁸ Ibid., p. 215.

¹³⁹ Ibid., p. 217.

¹⁴⁰ Ibid., p. 217.

¹⁴¹ Ibid., p. 217.

of aesthetic sense theory in his chapter 'The Goodness of the Deity,' where the specifically aesthetic problems of design were resurrected in a moral metaphysics of beauty as theodicy. For Paley, the purposeless pleasures of aesthesis 'can be resolved into nothing but the pure benevolence of the Creator' *because* they have no relationship to the functional utility that otherwise reigns in creation.¹⁴² Paley claimed that the 'effect' of this congruity 'evinces, on the part of the Author of nature, a studious benevolence,' as the 'pleasures which we derive from any of our senses, depend upon an original congruity between the sense and the properties perceived by it.'¹⁴³ God designed the various senses in 'congruity,' with the objects they will discover, not only for functional purposes, but equally for aesthetic purposes, and so our 'senses,' including that of beauty, 'appear to be specific gifts, ministering, not only to preservation, but to pleasure.'¹⁴⁴ Our sensorium – the very framework of our experience of the world – was marked, in the modality of pleasure, by the same excess to functional adaptation it discovered in its proper objects, with the Paleyan argument from design mapping these two teleologically similar forms of empty purposiveness one on to the other.

Having linked aesthetic sense to design, Paley understood congruity to necessitate the unanalysability of our aesthetic pleasures, as, although 'it may reasonably be asked, why is any thing a pleasure' there is 'no answer which can be returned to the question, but that which refers it to appointment.'¹⁴⁵ Aesthetic enjoyment was arbitrary, and, as Paley further phrased this 'appointment' of design, 'we can give no account whatever of our pleasures in the simple and original perception.'¹⁴⁶ The unthinkability of subjective pleasure was the mirror image of the unreasonableness implied by the beautiful object as it exceeded utility, and with which it was placed in congruity. Paley's aesthetics posited a domain of form, which, whatever its possible moral purposiveness, remained a wholly arbitrary 'appointment' in all its specifics. More worryingly still, this logic of ornamentality began to bleed through into the ostensibly technical order of contrivances, as our admiration of them – presumably itself a designed aesthetic enjoyment – undermined the functional rationality that was posed as the intuitive basis of the claim to design. Even the eye, the paradigmatic example of functional

¹⁴² Ibid., p. 519.

¹⁴³ Ibid., p. 521.

¹⁴⁴ Ibid., p. 523.

¹⁴⁵ Ibid., p. 524.

¹⁴⁶ Ibid., p. 524.

contrivance in *NT*, by itself ‘a cure for atheism,’ was now marked by this form of the purposive without purpose:

There are parts also of animals ornamental, and the properties by which they are so, not subservient, that we know of, to any other purpose. The irides of most animals are very beautiful, without conducing at all, by their beauty, to the perfection of vision; and nature could in no part have employed her pencil to so much advantage, because no part presents itself so conspicuously to the observer or communicates so great an effect to the whole aspect.¹⁴⁷

Beauty had no purpose in certain forms but beauty itself, and so the aesthetic experience of beauty in nature now comprehended both a ‘strong indication of design’ and a design without ‘any other purpose’ associated with the function that originally gave meaning to this design. Irrespective of its role within the organ most evincive of purposive finality in nature, the iris was beautiful without reason. *Because* this ornamentality had no relationship to the ‘perfection of vision,’ it challenged the supremacy of functional teleology, and what had begun as an exercise in pointing out design as an intuition of *technē* materially evidenced in organic form, fell ever closer towards a theory of the irrationality of divine fiat or whim – the pure ‘appointment’ of beauty. As Paley himself asked at one point, why did God create plants to be beautiful when ‘the purposes, so far as we can see, of vegetable nutrition, might have been carried on as well by its continuing green’?¹⁴⁸ There can be no straightforward answer in terms of function; beauty, as design more generally, simply is, because God willed it thus.

While Paley had claimed to provide an intuitive argument for design without the need for any attendant metaphysics, *NT* attempted to recuperate the excess to utility implied by the pleasures of beauty and other sensory enjoyments by framing them as a contrivance of a second order – a distinctively non-Kantian purposeless purpose with a moral function – in a philosophical manoeuvre that now directly implicated the overarching moral rationality of design.¹⁴⁹ But does this recuperation really work relative to the initial framing of the teleology

¹⁴⁷ See *Ibid.*, pp. 19-52; p. 214.

¹⁴⁸ *Ibid.*, p. 214.

¹⁴⁹ *Ibid.*, p. 16. On one of the few occasions that Paley’s aesthetics has been discussed, this apparently Kantian resonance, and Paley’s development of a theory of beauty as a ‘purposelessness with a purpose,’ has been stressed; see Heymans, pp. 159-60. However, beyond gross comparisons I remain sceptical. More interesting to me, is that Anglophone natural theology could develop its own non-Kantian vision of aesthetic teleology from within the historical coordinates of design.

of design as an intuition of functional purpose? Beauty had a possible moral end, but this function was itself a purpose without a purpose ('gifts, ministering [...] to pleasure'). Indeed, even when Paley computed – in line with his utilitarian commitments – the quantity of pleasure implied by the adaptive 'congruity' of sensorium to the beauty of the objects of the world, this only intensified the aporetics of Paleyan beauty. For Paley 'we are authorized to ascribe to the Deity the character of benevolence' by the existence of aesthetic congruity, and this benevolence 'must in him be *infinite* benevolence, by reason of the infinite, that is to say, the incalculably great, number of objects, upon which it is exercised.'¹⁵⁰ Thus, even in pursuit of a rational use, the world was made infinitely full of forms that didn't obey the logic of the watchmaker analogy: the gap between utility and beauty grew ever wider.

Returning to the issue of the beautiful adaptation or *technē* as it was inherited from a tradition of physico-theology, it is now possible to understand why this second teleology was so problematic, and how it challenged the fundamental assertion of Paley's original statement of design. Paley's argument was founded on the claim that it was *functional purpose* that led to an immediate and intuitive knowledge of a contriver, that 'the inference [...] is inevitable, that the watch must have had a maker: that there must have existed, at some time, and at some place or other, an artificer or artificers who formed it for the purpose which we find it actually to answer.'¹⁵¹ The idea of a purposeless purpose puts at risk the immediate movement from contrivance to the contriver, as when it was utility that authenticated the necessity of a contriver, a purpose without purpose – beauty – opened up the logical possibility of the appearance of contrivance *without* contriver as the fourth term of a relationship of purposiveness ↔ contriver | purposiveness without purpose ↔ *x* [contrivance without contriver?]. Objects in the world (e.g., the beauty of organisms) were held to have been marked with a purposiveness to our aesthetic sense, and so given Paley's own theory of congruity, beauty was neither a relative nor a purely subjective property, with subjective affect in perception matching an ontological reality. Aesthetic congruity ensured that any contradiction this formulation entailed could not be eluded: beauty and its teleological framework was real, and its aporetics a genuine problem attendant upon the ontological claim of Paley's theory of beauty. Gone was the tension between reason and taste in Kames'

¹⁵⁰ Paley, p. 527. For the intellectual context of Paley's moral philosophy, see Niall O'Flaherty, *Utilitarianism in the Age of Enlightenment* (Cambridge: Cambridge University Press, 2018).

¹⁵¹ Paley, p. 3.

understanding of adaptation, or in Boyle's hierarchical distinction between aesthetic intuition and knowledge of contrivance, but gone with it was the teleological consistency of the Paleyan design argument, because beauty and function now commanded an identical but contradictory epistemic status. Where the 'compound' of beauty and utility came apart at the seams, two conflicting intuitions of the teleology of design coexisted; *ars* as *technē* or artifactuality (the designed organism thought as utilitarian object); or art as its own unique teleological condition, albeit one which undercut the teleological form of artifactuality as Paley had initially posited it.¹⁵² The beauty in the adaptation, intended to mark the contrivance or adaptation as designed, now destabilised the functional teleology of design. Through the very movement by which Paley assured himself of the reality of beauty as a distinct *telos*, he nurtured the aporetics by which the contrivance no longer necessitated a knowable function, or a knowable contriver.

This was a major problem for the consistency of Paley's argument, as it acted to reopen several competing possible explanations regarding the general pattern of design or non-design in the cosmos. Some, from chance to the self-organisation of organic form (whether a 'principle of order' that 'existed in things' themselves, or even natural selection as 'aptness without intent'), were the very possibilities that Paley had attempted to render otiose through the watchmaker analogy.¹⁵³ However, regardless of these flaws, even within the terms of the design argument *NT* was highly productive, as its second teleology pointed towards ways of thinking adaptation or contrivance diagonally to the functional integration of the technical object. Indeed, most importantly for the remainder of this chapter and beyond, Paley's argument now gave affordances for the very approaches that claimed to contract or supersede the teleology of Paleyan natural theology, returning us to the question of the fatal doctrine of design without utility. For instance, through the development of a natural theological aesthetic sense theory, we can see how Paley's work already contained the nucleus of Huxley's later claim to replace, versus Paley, the 'principle of adaptation' by 'appeals to the aesthetic sense.'¹⁵⁴ *In abstracto*, Paley's theory offered resources for understanding beauty to represent an unconditioned form of purposiveness (adaptive design

¹⁵² Daston, p. 101.

¹⁵³ Paley, p. 7; Beer, p. 81.

¹⁵⁴ 'On Natural History,' pp. 192-3.

stripped of any concrete function). Within its contradictions, Paley's argument primed natural theological discourse for the morphological turn.

Yet, this realisation gives us good reason to question the way in which the fate of Paleyan design has been commonly narrated regarding the period from 1800-1850. For example, in his account of the political and professional world of the medical sciences in 1820s and 30s Edinburgh and London, Adrian Desmond has framed this time as a conflict between the politically progressive importation of continental science exemplified by the new morphology of France and Germany, and established intellectual, religious and administrative interests – the 'Paleyites' and 'gentlemen of science and their Anglican ministers,' who 'saw perfect animal design chant a hymn to Divine providence.'¹⁵⁵ The problem, as I see it, emerges from the way in which the concept of adaptation is commonly parsed, with Desmond using the language of Ospovat to discuss the 'Paleyites' in terms of the doctrine of 'perfect adaptation'; 'Paleyites' for whom 'perfect adaptation' was seen as 'part of the proof that God had created the best of all possible worlds.'¹⁵⁶ For Ospovat, the doctrine of perfect adaptation was the governing paradigm of the life sciences during this period, with the 'assumptions of perfection, harmony, and cosmic purpose [...] shared by most naturalists,' whether or not they proposed adaptive teleology or morphological unity as the overarching paradigms explaining divine design.¹⁵⁷ There was, on the one hand, and most relevantly to the figures of this chapter, a 'notion of perfect adaptation characteristic of Cuvier and the school of Paley, which may be designated conveniently and not too inaccurately as the Bridgewater variety.'¹⁵⁸ Such is the view of adaptive utility I have discussed apropos Paley, in which, as Ospovat takes it, 'the fit between form and function and between organism and environment is so close that it can serve as a complete explanation of organic phenomena.'¹⁵⁹ On the other hand, many thinkers took up views of design influenced by Geoffroy's morphology and German *Naturphilosophie* (i.e. Richard Owen), with such figures understood to propound a 'doctrine of "limited perfection,"' in which 'organisms are perfect [...] but they are created by laws, and they are only as perfect as is possible within the limits set by the necessity of

¹⁵⁵ *Politics of Evolution*, pp. 111, 1, 13.

¹⁵⁶ *Ibid.*, p. 111.

¹⁵⁷ Ospovat, p. 23.

¹⁵⁸ *Ibid.*, p. 33.

¹⁵⁹ *Ibid.*, p. 33.

conforming to these laws.’¹⁶⁰ In this second model, ascendant through the 1840s and 50s, the teleological determination of organisms was primarily unity of design or conformation to an archetype. Functional considerations only supervene upon this structure.

Contrariwise, as I have explored, a monolithic model of teleological function was not even strictly present in *NT*, which had broadened our intuitive grasp of contrivance to comprehend aspects of being that were palpably non-functional. So-called perfect adaptation always contained within itself discernible aspects of non-utility, and Paley’s own argument no longer maps on to a simple division between non-functional morphology and functional adaptation. For instance, where Paley’s argument took the nascent shape of CROE, adaptation entailed the fittedness between the world and sensorium that produced pleasure, but nothing beyond this fittedness-for-its-own-sake. Where, in the remainder of this chapter, I tackle the so-called ‘Bridgewater Variety’ of teleology, I will explore how authors devoted considerable effort to make sense of non-function in the aesthetic or the ornamental, and, in the case of Macculloch, began to bridge the teleological gap between the function and unity of plan by making aesthetic (non)purposiveness the overarching characteristic of all design. However, with perhaps the exception of Roget’s *Bridgewater* (1834), these authors were clearly not promulgating the new morphology, and so a liminal space was opened in which varying degrees of purposelessness could be assumed as necessary to maintain the coherence of divine teleology.¹⁶¹ I suggest then, that in order to properly understand the link between aesthetics and design, we have to move beyond the idea of perfect adaptation, which remains incredibly successful in its identification of *part* of the logic of natural theological teleology, but not those occluded or aporetic elements that could later be folded into morphological accounts, and were equally shared with the ‘Bridgewater variety.’¹⁶² Ospovat’s characterisation of the period in terms of a doctrine of perfect adaptation remains too limited in its definition of what counts as an adaptation, not least because even Paley proposed that there was that there was a teleology beyond adaptive functionalism.

¹⁶⁰ Ibid., p.34.

¹⁶¹ For instance, Roget I, pp. 49-52.

¹⁶² See my discussion of Owen’s ‘higher teleology’ pp. 85-94 below.

Whewell's 'Correspondencies' and the Idea of Life

Thirty-four years after its first publication, Charles Bell and Henry Brougham provided commentary for a new edition of Paley's *Natural Theology* (1836). If once it was enough to contrast a watch and stone to evidence design, for Bell and Brougham 'a considerable change has taken place of late years,' as now even the 'common reader' could not be without the 'reflection "how the stone came to be there."' ¹⁶³ Although Bell and Brougham still recognised the intuitive appeal of 'such natural reflections' on the differences between an artefact and natural object, Paley's wanderer upon the heath (maybe even Boyle's rustic) would now be armed with 'the many beautiful and interesting works on geology that have been published in our country of late years.' ¹⁶⁴ In short, these works would tell the wanderer that even this stone was a fragmentary evidence of a complex system of laws and historical processes that produced a world 'happily adapted to the abode of man.' ¹⁶⁵ For the natural theologian, the importance of advances in natural history and philosophy was their capacity to broaden the breadth of vision of the design argument. Understood in their fullest scope by the educated mind, the laws of physics and events of geological history are just as much contrivances as Paley's watch. However, a fundamental phenomenological difference still existed between these types of evidence: only the watch was possessed of the immediate and intuitive visibility of design.

Whewell's *Bridgewater* (1833) was dedicated to the appearance of design in the fields of astronomy and general physics, and the phenomenological distinction between different kinds of contrivance in nature presented a serious problem to this project. Although 'the nourishment, the enjoyment, the diffusion of living things, are willingly acknowledged to be a suitable object for contrivance,' and so 'men have no difficulty in recognizing as desirable the end which is answered by such adaptations,' in 'general physics' 'the simplicity [and] the permanence, of an inert mechanical combination might not so readily be allowed to be a manifestly worthy aim of a Creating Wisdom.' ¹⁶⁶ In *NT* the organism was the pre-eminent

¹⁶³ Charles Bell, Henry Brougham and William Paley, *Natural Theology with Illustrative Notes* (London: Knight, 1836), p. 1.

¹⁶⁴ *Ibid.*, p. 2.

¹⁶⁵ *Ibid.*, p. 2.

¹⁶⁶ Whewell, *Astronomy*, p. 16.

object of natural theological argumentation, and Whewell was similarly forced to accede that whatever the advances of modern science, animal forms still seemed to display a clearer sense of finality. Even in their otherwise purposeless ‘enjoyment,’ the organism remained ‘best suited to introduce to us the Deity as the institutor of Laws of Nature’ over and above the objects of the physical sciences.¹⁶⁷ Although several years later, Whewell’s *History* (1837) and *Philosophy* (1840) would give a systematic basis to this phenomenological complication by making an *a priori* idea of finality the condition of possibility of any science of life *per se*, Whewell had not yet developed this formal framework.¹⁶⁸ However, undeterred by the difficulty of manifesting the teleology of physics, Whewell’s solution was to focus on the link between the organism and the world it inhabits; to ‘point out relations which subsist between the laws of the inorganic world, that is, the general facts of astronomy and meteorology, and the laws which prevail in the organic world, the properties of plants and animals.’¹⁶⁹ By focussing on the purported legibility of design in one domain of nature and linking it to the other – the ‘correspondencies and adaptations’ of nature to humans or other organisms – Whewell attempted to make design intuitively legible across nature.¹⁷⁰ This detour, the interconnection of beings that traces design, is correspondency.

In this initial sense correspondency was cognitive, with the organism saving the design argument as it kept a phenomenological or intuitionistic appeal to observed complexity from foundering on the rocks of physical determinism. As only organic form exhibited the characteristics of *technē* that immediately indexed the ‘thought, purpose’ and ‘will’ of the designer with any persuasive force, living beings acted as the epistemic support that mediated discussions of teleology in other domains of nature.¹⁷¹ Natural theological argument must work inductively from the organism back to its imagined designer, and subsequently from the organism to its milieu as a focal point for discussions of general teleology. Not only was the organism adapted to an environment, but the environment was *just as much* an adaptation to the organism. Thus, considered from an ontological perspective, a limited view of correspondency was unsustainable. Thought in their generality, all correspondencies are bidirectional as all adaptations are in turn the milieu of other adaptations. Along these lines

¹⁶⁷ Ibid., p. 16.

¹⁶⁸ See, for instance, *Philosophy*, pp. xxxiv-xxxv.

¹⁶⁹ Whewell, *Astronomy*, p. 17.

¹⁷⁰ Ibid., p. 14.

¹⁷¹ Ibid., p. 345-6.

Whewell took up the question of the eye, ‘declared by writers on Natural Theology’ to ‘exhibit such evidence of design and skill in its construction, that no one, who considers it attentively, can resist this impression.’¹⁷² Although Whewell accepted this reasoning, he appended the decisive correction that it ‘must, at the same time, be obvious that this construction of the eye could not answer its purposes, except the constitution of light corresponded to it.’¹⁷³ It was no longer enough to claim *pace* Paley that the ‘eye would be alone sufficient to support the conclusion [...] as to the necessity of an intelligent Creator’, but any given contrivance must bear a relationship to a broader totality in order to exist as a functional contrivance.¹⁷⁴ As all beings are coadapted, and through an account of their coadaptations ‘we trace a Creator, who, in producing one part of his work, was not forgetful or careless of another part.’¹⁷⁵ Adaptation concerns the totality of nature as a unitary composition, and the ‘account taken of one part of the system in framing the other’ is a higher order evidence of ‘the mind [...] of the Intelligent Author of the universe.’¹⁷⁶ For Whewell, correspondency became the highest proof of a ‘wise and benevolent Creator, by whom all the parts of nature were fitted to their uses and to each other’: the overarching teleological architectonic of creation – ‘the general economy and mutual relations of all parts of the universe’ – was universal coadaptation.¹⁷⁷

This concept of universal coadaptational correspondence or ‘general economy’ of contrivance was not Whewell’s alone, with Roget’s *Bridgewater* also theorising adaptation in terms of correspondence. For example, discussing the link between meteorological phenomena and plant life, Roget understood ‘beautiful correspondence’ and ‘harmonious adjustments’ as evidence of a system divine design that converges with Leibnizian preestablished harmony:

We have here a striking instance of that beautiful correspondence, which has been established between processes belonging to different departments of nature, and which are made to concur in the

¹⁷² Ibid., p. 128.

¹⁷³ Ibid., p. 128.

¹⁷⁴ Paley, p. 81.

¹⁷⁵ Whewell, *Astronomy*, p. 20.

¹⁷⁶ Ibid., p. 21.

¹⁷⁷ Ibid., pp. 41 and 213.

production of remote effects, that could never have been accomplished without these preconcerted and harmonious adjustments.¹⁷⁸

Whatever the cognitive or phenomenological priority of organisms for the design argument, all adaptations, as a product of divine foreknowledge operating outside of time, are equiprimordial in the mind of God. At all orders of structure in the universe, coadaptation inhered in every relationship between beings, and by showing how all contrivances point towards other contrivances, natural theology aimed to arrogate this higher perspective of 'beautiful correspondence' to itself.

In an anthropological key, the major epistemic ramification of correspondency was that its universality necessarily comprehended every modality of relationship between objects and the human sensorium, with various kinds of correlation between the world and our perception secured by this same philosophical manoeuvre. Moreover, given the preestablished harmony of adaptations, all our sensory capacities or faculties were themselves guaranteed to function in harmonious tandem. For instance, returning to Whewell's discussion of the eye in his *Bridgewater*, Whewell did not simply understand the eye as a contrivance designed in terms of the functional 'advantages' of 'visual perception.'¹⁷⁹ The eye was also designed in view of 'ulterior faculties and capacities by which sight becomes a source of happiness and good to man,' and foremost among those was 'the sense of beauty, the love of art [and] the pleasure arising from the contemplation of nature', which 'are all dependent on the eye.'¹⁸⁰ The eye, then, is a contrivance which corresponds with multiple faculties by acting as a vanishing mediator between a plurality of objects in the world, which themselves correspond with a plurality of internal 'capacities.' By the concept of correspondency, every function mediated through the eye is independent, designed *ab initio* alongside their designated objects, and therefore no single faculty can claim absolute metaphysical priority. Where no faculty has priority, they are entangled or combined, and so another series of correspondencies exists which describes the relationships between faculties.

¹⁷⁸ Roget, II, p. 21.

¹⁷⁹ Whewell, *Astronomy*, p. 258.

¹⁸⁰ Ibid., pp. 258-9.

By way of illustration, Whewell granted the ‘the sense of beauty’ a moral and pedagogical utility, turning aesthetic pleasure into ‘a powerful instrument’ that ‘animates and refines [humanity’s] domestic tendencies.’¹⁸¹ On another register, the example of the eye was exploited by Whewell as the link between beauty (‘visual pleasures’) and knowledge took on a particular rhetorical power for the design argument: ‘as clearly as light and the eye are the work of the same author, so clearly also do our capacities for the most exalted visual pleasures, and the feelings flowing from them, proceed from the same Divine Hand.’¹⁸² Light, the venerable metaphor of knowledge, was equally the vehicle of beauty. Sight, the circular image of itself (we possess a clear vision of epistemic clarity), secured beauty the objectivity and prestige of divine design. In turn, the correspondence between ‘light and the eye,’ itself now ‘clear’, existed as the recursive image of epistemic clarity in the expansion of the natural theological argument to the further correspondencies of nature and the human mind.

For Whewell, the design argument had been fortified with a reflexive guarantee, as correspondency came to include the relationship of the mind to the world as one of the adaptations it described. An epistemic argument for design based on correspondency must be a product of the adaptive design it hypothesised, and so its epistemic claims were equally ontological claims, with discussions regarding our knowledge of the world bleeding through into claims about the fundamental architecture of the world as designed. Clearly, this argument was circular, but Whewell’s work of the late 1830s, his *History* and *Philosophy*, developed this logic on more properly philosophical terrain, using the form of the organism to argue for the necessity of teleological explanations, and through this necessity, the necessity of the hypothesis of design as the guarantee of the correlation of thought and world as such. Given that the basics of Whewell’s thought is well travelled ground, and in the next chapter I will return to Whewell’s later writing as it offered a theory of beauty, my treatment will be brisk, drawing out how Whewell’s philosophy of ‘Fundamental Ideas’ formalised the logic of correspondency as it applied to our capacities and the world (including an aesthetic correspondency between mind and object), and only did so through an ultimate appeal to *design* as the cornerstone of any inductive philosophy.¹⁸³

¹⁸¹ Ibid., p. 259.

¹⁸² Ibid., pp. 258-9.

¹⁸³ See *William Whewell: A Composite Portrait*, ed. by Menahem Fisch and Simon Schaffer (Oxford: Oxford University Press, 1991); Menahem Fisch, *William Whewell, Philosopher of Science* (Oxford: Clarendon, 1991).

As Whewell defined his notion of 'Ideas' in *Philosophy* (1840), 'the grounds of the universal and necessary truths which we are able to assert in various departments of knowledge, reside in certain general forms of apprehension, or relation of our conceptions.'¹⁸⁴ These *a priori* Ideas exist as the available forms we have to make sense of observational data, comprising 'the Alphabet, by means of which we interpret Phenomena [...] for these give to phenomena that coherence and significance which is not an object of sense.'¹⁸⁵ Although given *a priori* as a condition of possibility of experience, our knowledge of ideas itself *unfolded* through experience, where 'the exercise of our senses discloses to us, at the same time, the external world, and our ideas of space, time, and other conditions, without which the external world can neither be observed nor conceived.'¹⁸⁶ To capture this interplay of transcendental and empirical argument, Whewell recycled the same epistemic metaphor of 'light' from his *Bridgewater*, which 'reveals to us at the same time the existence of external objects and our own power of seeing.'¹⁸⁷ Like the equivocation between the synchronic and diachronic adaptation in Kames' work, although our Ideas were therefore always-already adapted to the world, it was only by the process of our shaping our minds to the world by which we came into our knowledge. In this sense, there could be no proleptic limitation of the Ideas we already somehow possessed. The primordial fittedness of our minds to the world through epistemic correspondency unfolded diachronically in the discovery of new Ideas during the progress of inductive science.

For my purposes, the most important of these fundamental ideas are those clustered around the 'Idea of Life' and necessary 'in order to obtain a Science of biology.'¹⁸⁸ For Whewell there was a 'peculiar Fundamental Idea' of a unique kind of living force ('Life is a system of Vital Forces'), with this 'system' underpinned by structural organisation or the compositional relationship of parts, wholes and functions rationalised by 'the assumption of a Final cause.'¹⁸⁹ As Whewell categorically stated in *Philosophy*, the 'assumption of a Final cause in the structure of each part of animals and plants is as inevitable as the assumption of an Efficient Cause for every event. The maxim that in organised bodies nothing is *in vain*, is as

¹⁸⁴ *Philosophy*, I, p. xiii.

¹⁸⁵ *Ibid.*, I, p. xvii.

¹⁸⁶ *Ibid.*, I, p. 73.

¹⁸⁷ *Ibid.*, I, p. 73.

¹⁸⁸ *Ibid.*, I, p. xxxiv.

¹⁸⁹ *Ibid.*, I, p. xxxiv-xxxv.

necessarily true as the maxim that nothing happens *by chance*.¹⁹⁰ The purposiveness of biological structure became the *a priori* condition of the intelligibility of life, and any science thereof. To reiterate, for Whewell a teleological structure of thought must be given prior to experience, as ‘this Idea of Final Cause is not deduced from the phenomena by reasoning, but is assumed as the only condition under which we can reason on such subjects at all.’¹⁹¹ The alternative is chance, disorder, and meaninglessness. Although Whewell would claim the authority of Kant as support for this teleological definition of life, the Kantian philosophy was thereby deployed for purposes that do not wholly cohere with Kant’s own work.¹⁹² For example, the *Kritik der Urteilskraft* was cited for having ‘asserted the reality of such a principle of physiology as we are now maintaining in the most emphatic manner,’ and that the ‘very definition of an organized being’ is founded on the ‘assumption of an end.’¹⁹³ Half-true, perhaps, but Whewell promoted teleological explanation to the position of the ‘master-principle’ of life by running together Kant’s view of final causation as regulatory ideal for teleological reflective judgement with his own analysis of final causation as a fundamental idea.¹⁹⁴

Unsurprisingly, where a science of life and natural theological argument were held as indistinguishable, the promotion of final causation to the status of a fundamental idea bled through into the claim that we possessed an aprioristic ‘notion of adaptation.’¹⁹⁵ Where, for Whewell, adaptation was itself an Idea given to thought, adaptive teleology was linked directly to an isomorphic claim of design, operating, alongside the other fundamental ideas of biological science, as the condition of possibility of knowledge about ‘organic structures’ that cannot be given by induction; that although ‘we cannot logically deduce design from the contemplation of organic structures [...] it is impossible for us, when the facts are clearly before us, not to find a reference to design operating in our minds.’¹⁹⁶ Nor was this gesture towards an innate idea of design simply an empty form of thought (the epistemic guarantee of having-been-designed that made the teleology of biological structures and our knowledge

¹⁹⁰ Ibid., I, p. xxxv.

¹⁹¹ Ibid., II, p. 78.

¹⁹² For discussion of Whewell’s questionable Kantianism, see Cornell, ‘Newton of the Grassblade?’ and Fisch, pp. 103-5 and 125-128.

¹⁹³ *History*, III, pp. 469-70.

¹⁹⁴ Ibid., III, p. 476.

¹⁹⁵ *Philosophy*, II, p. 79.

¹⁹⁶ Ibid., II, p. 82.

of these structures formally secure). By Whewell's argument of the cognitive necessity of design, there was 'nothing presumptuous or irrational' in making reference to the 'intentions of the creator' in everyday natural historical enquiry, when, on the rejection of this idea of designed final causes 'we cannot reason at all.'¹⁹⁷

Yet, the circularity at the heart of Whewell's argument is evidenced here in its greatest clarity, as although 'the Ideas which we necessarily employ in the contemplation of the world around us, afford us the only natural means of forming any conception of the Creator and Governor of the Universe,' simultaneously, the assumption of creation was understood as the only condition by which we could gain coherent access to biological phenomena.¹⁹⁸ Our intuitive power to transform the sense data of the world into meaningful forms discovered the mirror of its own teleological reasoning in living beings, with the 'the idea of Design and *Purpose*, of which we are conscious in our own minds [...] reflected back to us, with a distinctness which we cannot overlook, in all the arrangements which constitute the frame of organized beings.'¹⁹⁹ Where we 'possess [a priori] the idea of a Design in Creation' it must itself be a product of design, and so 'we cannot abstain from ascribing to the Creator the infinite profundity and extent of design to which all these special instances belong as parts of a whole,' with a pattern of thought originally localised to life universalised.²⁰⁰ Understood in this way, the living being had a profound role for Whewell's thought, as organic form, and the adaptive purposiveness it manifested, was the royal road by which we were destined to come to know design through the unfolding of our Fundamental Ideas. Life was the way in which we came to know teleology-as-adaptation in general, including the mutual adaptation of the world to our knowledge of it.

If this initially appears remote from a theory of aesthetic adaptation, concerned as it is with the adaptive purposiveness of functional form insofar as it provides a model for teleology in general, the importance of Whewell's argument was that by achieving the perspective of the divine, all correspondency was absolutised. The same metaphysical guarantee ensured that all our mental capacities as they related to the world were themselves (at least in principle) grasped as discrete and knowable properties. All our modes of thinking

¹⁹⁷ Ibid., II, p. 91.

¹⁹⁸ Ibid., II, p. 92.

¹⁹⁹ Ibid., II, p. 582.

²⁰⁰ Ibid., II, p. 92.

or feeling partook of this same divine reflection, and so, as Whewell had argued in his *Bridgewater*, ‘the sense of beauty, the love of art [and] the pleasure arising from the contemplation of nature’ could themselves be secured as divinely ordained relationships with their proper objects within the world.²⁰¹ Accordingly, Whewell’s thought, and its shift from correspondency to fundamental ideas, gives a perspicuous indication of how beauty, phrased by Benjamin Morgan as the ‘moment of concordance between human beings and natural surroundings,’ could be given a more formal philosophical basis within the general adaptationist framework of 1830s natural theology. It was, moreover, a conceptual foundation that always circled around the organism as its teleological model, a connection that will return where I take up Whewell’s later aesthetics.

Natural Theological Aesthetics in the 1830s – Thomas Chalmers and John Macculloch

In this section, my argument moves from correspondency as a teleological framework of universal mutual adaptation towards the aesthetic theory offered on this foundation: CROE as the correspondency that inheres between the properties of an object designated as beautiful and the pleasure liberated by the act of perception. As I claim, many of the core aspects of the natural theological theory of beauty promulgated by figures in the nineteenth century closely resembled eighteenth-century internal sense aesthetics, initially translated into Paleyan terms, but increasingly made to cohere with changing trends in both natural theology and the sciences through the 1830s-50s. I will turn to some of these interactions and innovations in the following chapter; here I outline two approaches to beauty falling under the conceptual umbrella of the ontology of enjoyment and exemplifying this category. The two protagonists of this section are somewhat obscure figures in the history of ideas, but are useful precisely because of the typicity of their writing as it captures a movement from aesthetic sense theory to an account of beauty framed in terms of adaptationist teleology, and the subsequent transformation of this adaptationist teleology of function into *something else* as it attempted to make sense of aesthetic properties as a purposeless purpose of design.

²⁰¹ Whewell, *Astronomy*, pp. 258-9.

As the literature has never approached these figures as aesthetic theorists before in any serious capacity, my readings in this section are detailed and expository. I begin by exploring Chalmers' claim to a natural theology 'reasoning on the element of beauty' alone, and his defence of a theory of innate aesthetic sense and its nominate objects against associationism (and, as its fascinating corollary, the conversion of association *into* correspondency).²⁰² I then turn to Macculloch's *Attributes*, a work of natural theology initially delayed by the publication of the *Bridgewater Treatises* because of their similarity, charting how CROE as a theory of aesthetic adaptation pushed the tensions of the Paleyan framework of utility and non-utility to its logical limit, developing a theory of aesthetic design that pointed the way towards a wholly new model of what the teleology of creation meant more universally.²⁰³

Where Whewell's thought represented one of the more theoretically self-conscious expositions of adaptationist arguments, analogous but less rigorously formalised views were widespread amongst many authors as they formulated a theory of beauty. Thomas Chalmers' *Bridgewater* was particularly reliant on correspondency, making the axiom of the extension of natural theology to the 'moral attributes' (inclusive of our aesthetic capacities) the generalised guarantee that 'the mind is rightly placed in a befitting theatre for the exercise of its powers,' and 'the things which are around him bear a fit relation to the laws or the properties which are within him.'²⁰⁴ Although Chalmers did not acknowledge it, this vision of the mutual adaptation between mind and world even deployed the same metaphor as Hutcheson's *Inquiry*, with Chalmers universalising the image of the 'theatre' to comprehend any possible mode of relationship between a perceptive subject and their environment. Indeed, the claim of correspondency was so strong for Chalmers that the partition of mental faculties could be used to argue for distinct types of natural theology, each located in their respective faculty. The beauty of nature was just such an instance; for Chalmers there was a specifically aesthetic natural theology, and the physical world – the 'materialism of creation, the loveliness of its scenes and landscapes' – provided the 'materials for a Natural Theology' founded solely by 'reasoning on the element of beauty.'²⁰⁵ Because the very existence of a faculty was a secure proof of its corresponding objects, and, symmetrically, the properties of

²⁰² Chalmers, I, p. 190.

²⁰³ Macculloch, I, p. i.

²⁰⁴ Chalmers, I, p. 43.

²⁰⁵ Ibid., I, p. 190.

an observed object must correlate with a receptive faculty, the simple existence of either could be taken as a proof of design.

Brandishing this uniquely aesthetic proof, the facticity of a perceived property represented sufficient rational ground for the operation of the design argument, as ‘to construct a natural theology on any subject, it is not necessary to make of that subject a full scientific exposition.’²⁰⁶ Fortified by the circular guarantee of design, Chalmers argued from ‘the undoubted truth that [something] is so, and not on the undetermined, perhaps indeterminable question of how it is,’ with the differences between natural theology and science determined along axes of primary and secondary causation; by the difference between the ‘study of final’ and ‘the study of efficient causes’²⁰⁷ Final causes are cardinal, ‘patent to observation, while the latter [efficient causes] may be still involved in deepest obscurity.’²⁰⁸ Facts considered as ends in nature are clearer than their efficient realisation, and speculative teleological reasoning was granted an explanatory supremacy by the guarantee that all that exists must be a function of rational design. Although knowledge of efficient causation is useful, it is only mediate: we can have empirical knowledge of a primary cause without any adequate representation of secondary causation. Given that the facticity of a property was not a function of its being rationally or scientifically known, but only perceived and felt, and the design argument guarantees the validity of this facticity, a theory of beauty has no requirement for an account of its efficient causal structure. Beauty had been redefined as adaptation *simpliciter*, or at least a specific modality of adaptation that inheres between certain kinds of object and our sense of beauty. The idea of a specific aesthetic adaptation had an unimpeachable security, and the ‘element of beauty’ – distinct from knowledge proper yet still a purposive adaptation of the world to our faculties – was brought wholly within the domain of natural theology. The mind that seeks beauty and the beauty it discovers are equiprimordial in design, and beauty is the doubly articulated question of the correspondency of a human sense with its proper object (CROE). Thought from the perspective of its object, beauty is an adaptation produced by God in preestablished harmony with the faculty that will discover it. At one pole of the relationship beauty, at the other taste.

²⁰⁶ Ibid., I, p. 3.

²⁰⁷ Ibid., I, p. 4.

²⁰⁸ Ibid., I, p. 4.

Having tied aesthetics to a teleological framework, Chalmers's theory of beauty turned polemical, thought through and against the terms of associationism, exemplified by Archibald Alison, who became the principal intertextual stand in for Chalmers's assent with and dissent from associationist orthodoxy.²⁰⁹ In Chalmers's words, theories of an 'associating principle' understand 'our admiration of beauty in material objects' as 'resolvable into other and original emotions, and, more especially [...] into our admiration of moral excellence.'²¹⁰ For Chalmers, if associationism were true, a theory of beauty and taste would be subordinate to a philosophical ethics (a heteronomous concept of the good that would provide the ultimate reason for attributions of beauty). However, despite Chalmers allowing association to exert 'extensive influence' over the higher aesthetic pleasures experienced by individuals, his argument remained that associationist aesthetics cannot explain the foundations of the experience of beauty and an attendant principle of taste.²¹¹ Instead, the cornerstone of natural theological aesthetics must be that the 'laws of taste' are (conceptually) 'primitive' and not in any way 'secondary' to any other faculty or representation.²¹² Such laws of taste were, in short, the correspondency describing the aesthetic adaptation between the mind and world, with the primitive 'sense of taste' correlated with objects which produce 'various pleasurable sensations.'²¹³ For example, in a visual modality, taste circumscribes the relationship between 'the beauty which overspreads the face of nature, and the exquisite gratification which it ministers to the senses of man.'²¹⁴ As different senses have different corresponding objects that produce pleasure, a 'philosophy of taste' must be sufficiently general to cover the various modalities of the aesthetic, taking in the 'beauty and the sublimity of sounds' as much as the images of the 'poet's eye' and the pleasures of visual beauty.²¹⁵

Where the common faculty for sensing beauty was designed, taste was largely universal, implanted by God as the coadaptation between the aesthetic form of the world and our generic capacity for receiving it. Take, for instance, Chalmers's discussion of the

²⁰⁹ See, for example *Ibid.*, II, pp. 74-89; Archibald Alison, *Essays on the Nature and Principles of Taste* (Edinburgh: for Bell and Bradfute, 1790).

²¹⁰ Chalmers, I, p. 47.

²¹¹ *Ibid.*, II, p. 74.

²¹² *Ibid.*, I, p. 47.

²¹³ *Ibid.*, II, p. 188.

²¹⁴ *Ibid.*, I, p. 200.

²¹⁵ *Ibid.*, II, pp. 74-76.

pleasures of sound, whether in music, or here, a facultative delight in the ‘sounds of nature’ (birdsong etc.):

there is a common, an every-day enjoyment which all have in the sounds of nature ; and as far as sympathy with human emotions is awakened by them, and this forms an ingredient of the pleasure, it affords another fine example of an adaptation in the external world to the mental constitution of its occupiers.²¹⁶

By dint of their species-being all humans possess a ‘common’ enjoyment in particular forms. The consonance or ‘sympathy’ between an aesthetic faculty and its objects produces a pleasure irreducible to association, and all are similarly possessed of a shared aesthetic capacity adapted to and equiprimordial with the objects it will discover.

Still, Chalmers did not dismiss associationist aesthetics out of hand, even allowing (‘with Alison and others’) that ‘much of the beauty of visible things lies in association.’²¹⁷ Yet, to reiterate, Chalmers was not an associationist. Instead, the greater part of Chalmers’s novelty was his attempt to show how association had been a useful working hypothesis for any aesthetics insofar as it correctly maps the network of relationships of aesthetic adaptations that produce pleasure, albeit without providing a satisfactory account of their origins. In Chalmers’s words, if association were true over against the postulate of a faculty of tastes and its proper objects, the ‘only effect on our peculiar argument’ would be that:

the benevolence of God in thus multiplying our enjoyments, instead of being indicated by a distinct law for suiting the human mind to the objects which surround it, is indicated both by the distribution of these objects and by their investment with such qualities as suit them to the previous constitution of the mind.²¹⁸

Association, as a combination of disparate elements productive of pleasure, is simply a mediated version of the ‘distinct law for suiting the human mind to the objects which surround it’ (i.e., correspondency). Given the equiprimordiality of the mind and the world in the design of the creator, the correlation between subject and object in the associationist

²¹⁶ Ibid., II, p. 75.

²¹⁷ Ibid., II, p. 80.

²¹⁸ Ibid., I, p. 47.

philosophy of taste redoubles the argument of an innate disposition for certain aesthetic objects but with further additional steps inserted between the mind and its proper object – felicitous ‘distribution’ and a sympathy of ‘qualities.’ So much for aesthetic sense giving way to association; natural theology recaptured association and transformed it into an innatism, where ‘if it be not by the implantation of a peculiar law in mind’, ‘the blessings which we enjoy [...] can at least be ascribed to a useful disposition of circumstances in the theatre around [us].’²¹⁹ Whether grounded through a ‘primitive’ aesthetic faculty or association, for Chalmers it could only be divine design that ‘caused the outer world of matter to image forth in such profusion those various qualities, which at first had pleased or powerfully affected us in the inner world of consciousness and thought.’²²⁰ The priority of divinely instituted beauty (‘at first’) remains key, as whatever the ‘modifying operation of circumstances’ by which ‘primary is transmuted into a secondary law,’ the ground of a theory of beauty and taste remained adaptation, which is to say, CROE.

Association, then, was superficially attractive because it correctly traced the objective relationship of beauty to our faculties as they were instituted by God. Association might even describe the further progress of our discovery of beauty in the world as a ‘secondary law’, but it was no longer the essential premise of any aesthetics. Yet, by the same token, associationism was rehabilitated through an account of aesthetic adaptation, as the association between positive qualities productive of pleasure allowed aesthetic subjects to retrace the original web of aesthetic adaptations that existed in the world. A theory of the ‘primitive’ nature of taste subsumes associationist aesthetics, and while a natural theological sense theory could reconstruct an associationist account of beauty, it had no fundamental need for association as its metaphysical ground remained design. That Chalmers argued for an aesthetic sense theory against associationism whilst also claiming to take a melioristic position now makes more sense: association is not the superintending teleological *arche* of taste, but can be used to provide an efficient causal account of its operation in the individual human. Our experience traces fixed possibilities of relationships that always-already exist in the design of God, placed in this world as a network of aesthetic objects navigable by the subject possessed of a faculty of taste. Association was the diachronic process of our taste

²¹⁹ Ibid., I, p. 48.

²²⁰ Ibid., I, p. 48.

becoming-adapted to a set of relationships that already existed synchronically within the eternity of design, with apparently dynamic and transitory relationships in the world reified. Where those two temporalities overlapped, Chalmers' theory provides a first route by which to cash out CROE as entailed by the generalised adaptationism of correspondency, with our transitory enjoyment framed as the actualisation of a relationship that possessed a permanent ontological status within design.

However, by sidelining associationist psychology, the fundamental experience of pleasure at the heart of beauty remained unexplored. The question, "why is x beautiful?", could no longer be satisfactorily answered "through its pleasurable association with y ," and no other positive account was made to answer in its place. There was, as per Chalmers's general outline of aesthetic final causes, no need for an explanation of the efficient causal structure of the production of beauty, and no requirement for a psychology of taste. Commensurately, Chalmers offered no concrete analysis of the pleasures of beauty, instead taking refuge in speculative teleological explanations. The existence of human taste was referred directly to a 'kindred taste' existing in God, with the apparent facticity of beauty in the world becoming sufficient pretext to gesture towards divine taste:

When we look to the beauty which overspreads the face of nature, and the exquisite gratification which it ministers to the senses of man—we cannot doubt, either the taste for beauty which resides in the primeval mind that emanated all this gracefulness; or the benevolence that endowed man with a kindred taste, and so fitted him for a kindred enjoyment.²²¹

Clearly, the 'taste for beauty' was not explained by this gesture, referred instead to the great beyond and granted the empty form of objective validity without concrete meaning. Where the faculty of taste was guaranteed by divine design, Chalmer's theory of beauty became a function of a ternary correspondence between the aesthetic taste of God (the 'kindred taste' of the 'primeval mind'), the objects he produces, and the taste of 'man'. The human faculty of taste is made in the image of God, and so the ascription of beauty must be somehow correct, irrespective of our knowledge of its dynamics. Pleasure is arbitrary, but it is divine, with the aesthetic accorded an irrefragable reality.

²²¹ Ibid., I, pp. 190-191.

This same ineliminable kernel of divinely-ordained pleasure was at the heart of John Macculloch's definition of beauty in *Attributes*, with visual beauty – the paradigmatic example in Macculloch's theory of taste – framed simply as the sum of 'pleasures derived from the sense of seeing.'²²² Although generally formulated in terms of visual beauty, each sense was the origin of an analogous pleasure when presented with its proper objects, and so even smell, taste and touch were sources of enjoyment that fell within the purview of Macculloch's theory.²²³ What mattered in categorising such pleasures as aesthetic was their teleological form, with their common defining characteristic an irreducibility to functional adaptation. Beauty must be expressly defined in contradistinction to adaptive utility, and for Macculloch it was axiomatic that 'beauty and variety, whether in form or colour, are utterly purposeless.'²²⁴ As the beauty of an object pleases without any associated function, even when a beautiful object possesses utility, it simultaneously contains within itself an excess to its functional aspects and relationships. For example flowers, irrespective of any adaptive function, are equally 'a superfluity, an example of gratuitous beauty.'²²⁵ The different senses, each performing their respective sensory roles – 'given for the purposes of utility' – are tasked with the additional role of liberating pleasure, having 'been so contrived as to be the means of much more [than utility], in the production of that superfluity of effect which constitutes pleasure, simply, and apart from any use, in the proper sense of that term.'²²⁶ Pleasure is a 'superfluity' that indicates an aesthetic property in creation beyond a utilitarian understanding of adaptation. As these 'useless properties' of objects are 'cognizable by nothing but those peculiar senses, and, when recognised by them, [are] sources of pleasure, and nothing else,' beauty is a unique and conceptually primitive property of objects that correlates with a unique faculty directly 'contrived' to take pleasure in them.²²⁷

Given the possible overlap between adaptive functionality and beauty as it is experienced in the world, Macculloch was, as Chalmers, at some pains to disentangle beauty from association, with a substantial portion of Macculloch's direct theorisation of aesthetic categories negative or critical. For instance, Macculloch took up historical theories of

²²² Macculloch, III, p. 242.

²²³ See, for example, *ibid.*, III, pp. 239-40.

²²⁴ *Ibid.*, II, p. 43.

²²⁵ *Ibid.*, I, p. 450.

²²⁶ *Ibid.*, III, p. 238.

²²⁷ *Ibid.*, III, p. 238.

‘association’ (again identified with the figure of Alison), in which ‘the source of Beauty has been sought in utility, added to intrinsic form.’²²⁸ Although a particular individual might find pleasure in objects that are associated with some other kind of good, any specific association was discounted as a viable foundation for a general theory; obvious contradictory cases exist, for example the ‘innumerable beautiful objects for which no possible use can be imagined, even under [...] the most remote and fanciful association.’²²⁹ Certainly, Macculloch granted that an individual’s personal associations were ‘accessory or additional sources of pleasure,’ but these remained ‘confined to a few individuals,’ and did not take account of the real foundation of taste, which must be discovered in the ‘universal experience of mankind.’²³⁰ Moral association, as much as the association of beauty with any other property, were similarly discounted; for Macculloch, ‘all [such] hypotheses are equally disingenuous’ insofar as they likewise confuse beauty with some other property.²³¹ For Macculloch this position entailed a hard problem of the philosophy of taste, because ‘our faculties have not been made capable of comprehending’ why the properties of an object cause pleasure.²³² Given the quality of beauty was irreducible to understanding, it could not be subsumed by, or identified with, any other property. Indeed, Macculloch categorically rejected historical explanations for why pleasure was produced during the experience of certain objects, and, among others, Hogarth’s ‘line of beauty’ or Burke’s psychologism were criticised as failing to provide a ‘theory’ of taste but only a ‘classification’ of which objects are beautiful and the types of beauty they exhibit.²³³ Aesthetic association and a descriptive model of beauty were allied insofar as they both fail the impossible test that Macculloch set any theory of beauty; the ‘essential question [...]: why do those forms excite the pleasing sensation which is the feeling of beauty?’²³⁴

The ‘essential question’ had become, as Macculloch put it, an ‘essential difficulty,’ with Macculloch’s answer, in line with Paley’s development of a second teleology, to actively assume the unanalysability of aesthetic pleasure and prize it as a symptom of direct design.²³⁵

²²⁸ Ibid., III, pp. 249-50. See also *ibid.*, III, p. 245.

²²⁹ Ibid., III, p. 250.

²³⁰ Ibid., III, pp. 255-6.

²³¹ Ibid., III, pp. 253-255.

²³² Ibid., III, p. 264.

²³³ Ibid., III, pp. 246-9.

²³⁴ Ibid., III, p. 249.

²³⁵ Ibid., III, p. 250.

With the elimination of any efficient or mediate explanation for the feeling of beauty, only the direct intervention of divinity would do; the empty teleological form of beauty was reduced to divine fiat regarding a purposefully ordained purposelessness that 'implies a reference to the Will of the Creator, as the sole cause which can be assigned for an effect, in the absence of any apparent secondary causes.'²³⁶ The negative subject pole of the aesthetic relationship mapped directly onto the negative object pole, and just as the subjective account of the feeling of beauty had no intellectual content (no other category or property captures this pleasure), the beautiful object possessed no property that causes beauty other than beauty itself:

He [God] has, for this end, appointed an instinctive feeling of Beauty, or commanded that certain forms and colours shall produce pleasure, simply and directly: while, of the actual causes of this pleasure, as of the condition of mind which it implies, we are entirely ignorant. [...] This feeling of Beauty is therefore a portion of the original constitution of Mind; having no reference to any other of its qualities or operations: and it is also excited by a multitude of causes, exceedingly numerous in properties, and as distinct; admitting of but very limited classification, and agreeing in no one common property but this, that they excite the feeling of Beauty; yet under varieties connected with their peculiar properties.²³⁷

The 'instinctive feeling' of beauty had no cognitive mediacy; its effect was achieved 'simply and directly' without reference to any other properties of mind. Concurrently, objective instances of beauty could not be resolved into a 'common property.' Given that no determinate features of an object were themselves beautiful, and the 'actual causes of this pleasure' (if they exist) are eternally lost to human knowledge, Macculloch's theory of beauty prescribed itself only two requirements: the self-evident facticity of beauty and God as its metaphysical guarantor.

So, although there are different kinds of beauty, and the 'peculiar properties' of distinct objects might allow some degree of classification of types of beauty, ontologically, there is nothing *in* the object that acts as efficient cause of beauty. *Nothing* causes the feeling of beauty, with the causal or explanatory void of beauty operating as the signature of the divine. Take, for instance, Macculloch's discussion of the beauty of music:

²³⁶ Ibid., III p. 239.

²³⁷ Ibid., III pp. 263-4.

It is truly an art of the Creator's own invention. It is contingent on nothing. It is not a necessary result of any other arrangement in Creation: it is a pure and arbitrary appointment, an independent invention, connected with nothing else, and intended for a special end. Like the beauty produced through form and colour, it is an invention for the sake of those sentient beings whose organs of sense have also been constructed and adapted to feel it: intended for their gratification and pleasure.²³⁸

Although nothing in the beautiful object acts as the efficient cause of pleasure, beauty still elicits pleasure because of the adaptive fitting of world and 'organs of sense.' The resolution of the 'essential question' of why forms produce pleasure is achieved through a direct appeal to design that dissolves the meaningfulness of the question of beauty as it was first formulated. Beauty is not any ordinary *telos* within design that can be explained by the provision of an orderly secondary causal structure, and the pleasures of aesthesis remained a 'special end' singularly irreducible to efficient causal explanation. Having made beauty almost wholly unanalysable, Macculloch's explanation of beauty operated at the very limit of the rationality of design, with 'the direct will of the Creator to produce a specific effect on Mind, the only Theory of Beauty that can be furnished.'²³⁹ Unsurprisingly, Macculloch was aware of the circularity this theory, but it was a circularity he consciously assumed as it dissolved the philosophical problems of beauty, conceding that 'it may be true, that this is to cut the knot, not to loosen it: but it is a knot that will not be dis severed in any other manner.'²⁴⁰ As with Chalmers' *Bridgewater*, the relational and teleological structure of aesthetic experience was preserved, but it was ultimately evacuated of philosophical content.

Yet, Macculloch's elimination of any mediate causal factor and his turn towards the direct agency of design as the only explanation of the experience of beauty (a position approaching a kind of aesthetic occasionalism) was not an argument without precedent, representing the intensification or amplification of certain possibilities already immanent to aesthetic sense theories, especially in their reliance upon gestures towards inherent nature or design to underpin the relationship of a faculty to its proper objects. Whilst recognisably similar to the theory of Hutcheson or Paley before him, Macculloch's aesthetics pushed internal sense to its logic limit, with the perception of the beautiful now bearing no relationship to any given property in an object (gone is Hutcheson's 'uniformity amidst

²³⁸ Ibid., III, p. 301.

²³⁹ Ibid., III, pp. 264-5.

²⁴⁰ Ibid., III, p. 285.

variety') beyond that of the pure form of being beautiful, which was a property that only God explained through a contentless gesture towards being-adapted-to-aesthetic-sense. Whatever the impossibilities of accounting for 'why' beauty causes pleasure, as 'the final cause [...] or the intention of the Creator, cannot be doubted [...] so ought we to conclude, that in every special instance, the appointment, or invention, was directed to that very end.'²⁴¹ CROE comprehended a divinely ordained relational structure productive of aesthetic pleasure, a relationship which, produced and guaranteed directly by God without further grounds of explanation or meaning, itself represented the ontological substrate by which beauty was granted reality.

Where Macculloch relied on an occasionalist fiat by which the aesthetic correlation became nothing more than a direct product of design, it followed that a theory of aesthetic value or the normativity of taste must be brought under the same injunction:

it is in the Deity alone that we can truly seek the standard of taste. Metaphysical reasoning assures us that He is perfect, and the only perfect: and it is in His knowledge, and judgment of Beauty, where we cannot seek it, that this standard should be sought.²⁴²

Given God's unimpeachable taste and omnipotent capacity to materialise its dictates, for Macculloch it followed apodictically that 'all creation ought to display beauty.'²⁴³ All creation, insofar as the deity is 'perfect', *must* be beautiful. Therefore, 'he who sees and feels those beauties in the greatest number and perfection, will approach nearest to the standard of Taste,' and 'fastidiousness,' 'censure and discontent,' any elements of discrimination, were now understood as displaying a lack of true taste.²⁴⁴ Wholly promiscuous taste that exults in the beauty of all that exists must mark 'the most, or the greatest, or the best, Taste.'²⁴⁵ Indeed, not only was beauty universal, its appreciation was made correspondingly universal, and where, for instance, the form of animals were created as 'ornament [...] serving no other purpose,' it could only be 'intended as a source of pleasure' to the creatures that possessed it.²⁴⁶ For Macculloch the 'same consciousness of beauty [...] pervades all creation, and is one

²⁴¹ Ibid., III, p. 238.

²⁴² Ibid., III, p. 270.

²⁴³ Ibid., III, p. 271.

²⁴⁴ Ibid., III, p. 271.

²⁴⁵ Ibid., III, p. 271.

²⁴⁶ Ibid., II, p. 33.

of the beneficent gifts of the Creator to all His creatures.’²⁴⁷ All beauty was real, and all perception of beauty, human or otherwise, was real.

Yet here, in this universalisation of beauty as the sign of design, the same paradoxes that had dogged Paley’s second teleology began to show. Where ‘it was designed that everything should be beautiful,’ beauty became the affective signature of design discovered in every aspect of the created world.²⁴⁸ Forms were produced across nature for no reason beyond that of fascinating our gaze, capturing our reason, and offering pleasure – the works of a ‘perfect Artist,’ produced ‘as if the Creator had intended to display his power and resources; and if so, for what other purpose than for our contemplation?’²⁴⁹ Moreover, even where beauty was linked to an explicit index of *technē* – the common trope of natural theological style – its constitutive ‘superfluity of effect’ introduced the consideration of an aesthetic logic in excess to technical rationality.²⁵⁰ For example, Macculloch offered the instance of the ‘beautiful invention’ of a Stork’s leg, which, rendered beautiful by its excessiveness to its own functional requirements, existed as a ‘gratuitous contrivance [...] adopted for no other purpose than to demonstrate the resources of the Artist.’²⁵¹ Was the design of the world governed by functional rationality, aesthetic rationality, or one in the service of the other? In Chalmers’ *Bridgewater* this same question was equally pressing, as natural theology, distinct from the ‘direct manifestation’ of revealed religion, was an argument founded on a ‘reflex or circuitous [...] revelation,’ that needed the supplement of superfluous or aesthetic forms; an ‘operose and complex instrumentality’ that made ‘the triumph of art [...] conspicuous.’²⁵² Short of direct revelation, the aesthetic excess of design was the best index of the designedness of the world and the attributes of that designer, an ‘ostensible ingenuity’ that acted as the ‘signatures [...] impressed on nature’ by its creation.²⁵³ Yet where the world became formalist in ‘reflex revelation,’ the specifics of such form were arbitrary. They were empty indexes that testified only to the fact they were designed – designed simply to be coadapted with our senses.

²⁴⁷ Ibid., II, p. 33.

²⁴⁸ Ibid., III, p. 285.

²⁴⁹ Ibid., I, p. 244.

²⁵⁰ Ibid., III, p. 238.

²⁵¹ Ibid., I, pp. 228-229.

²⁵² Chalmers, I, p. 53.

²⁵³ Ibid., I, p. 53.

Thus, all *technē*, even when aimed at function, was at risk of becoming art for its own sake, and in this trend towards purposelessness marked by teleological characteristics of beauty. As I have shown, Macculloch actively prized beauty as a universal *telos* of design, and so considered teleologically beauty not only stood to subsume utility, adaptation and contrivance – otherwise the principal empirical instances which ‘mark intention and design’ – but, in a world where everything was adapted to be beautiful but only certain adaptations useful, these functional adaptations become utilitarian instances of beauty, now understood as indexing an overarching architectonic of aesthetic design.²⁵⁴ So, Macculloch’s theory of beauty didn’t just intensify the teleological aporia of design as it was inherited from the Paleyan tradition, but served to wholly invert the teleological architecture of this tradition. Where everything was marked by a signature of design with ‘no apparent reason’ beyond pleasure and divine fiat, beauty, thought in terms of CROE, offered the form of purposiveness to the design argument as a generalised state of being-designed without further qualification.²⁵⁵ The cosmos was art and our perception of it pleasure, and by its very circularity a theory of beauty as the coadaptation of form and sense allowed an aesthetic teleology to take on a profoundly important philosophical role. Design – known intuitively as a pleasure that has no necessary relationship to utility – tracked ever closer the form of the purposive without purpose. Design was, in its fundamental logic, aesthetic.

Throughout my discussion in this chapter, I have developed the idea that under CROE, beauty could not be ultimately analysed, with natural theological aesthetic theory trending towards divine fiat as a teleological cause without an organising *telos* discoverable through means-ends rationality. Whatever the relationship of ontological precedence between utility and non-utility, creation contained a second distinctive rationality beside that of functional adaptation – a logic of ornamentality – and where beauty and its enjoyments were given an unimpeachable and absolute ontological security, this second teleology existed as a supplement to utilitarian aspects of design in nature. There were, of course, attempts to recuperate this teleology for the purposes of utility, where, for instance, Paley had fleetingly deployed the purposeless purpose of beauty as a moral argument in *NT*.²⁵⁶ However, beauty could only take on this role *because* it had no other functional utility; it was a gift in excess of

²⁵⁴ Macculloch, I, p. 162.

²⁵⁵ Ibid., I, p. 229.

²⁵⁶ Paley, p. 527.

any necessity. By the 1830s the shift towards the purposeless purpose as the defining characteristic of beauty was, for some authors, complete. As Macculloch phrased the link between uselessness and the ultimate moral rationality design with absolute clarity: ‘we can prove that He must be good, or beneficent, because He invents or adopts contrivances for the purpose of imparting pure, or superfluous good, being, to His creatures, enjoyment or happiness, independently of utility.’²⁵⁷ So, although such forms could still be recuperated through a kind of theodical utility, this was not, in any meaningful sense, the Paleyan functional teleology of organisms that had motivated these adaptationist arguments from the outset. The ‘superfluous good’ of the Divine was a kind of senseless moral ransom – how does one rationalise ‘pure, or superfluous good,’ when such good was thereby rendered arbitrary? Creation could have taken an infinite number of counterfactual forms as there was no longer any rational constraint of use governing its specificity. The overarching rationality of design was poised on the cusp of utility and nonutility, recuperable, perhaps, as a higher utility, but still aporetic as a utility that was itself a purpose without purpose, and thus possessed of the self-same teleological form as beauty.

Yet, as I shall address in the following chapter, a natural theological theory of beauty derived through the terms of an adaptationist paradigm was now capable of being synthesised with its ostensible opposite as it has been commonly narrated in the history of science and ideas. From Richard Owen to Hugh Miller to the later work of Whewell, where the ultimate reason for the form of beings was understood as unity of design (the rationale for the plan of creation was this plan for its own sake), the teleology of CROE became isomorphic to one of the central philosophemes of transcendental morphology. A purposiveness without purpose – form without function – would become the ultimate rationale of creation in both theoretical alternatives. Paleyan or ‘Bridgewater variety’ teleology as it has been characterised by Ospovat, could collapse into an aestheticised form of natural theological idealism through the resources of its own teleology.²⁵⁸ This, I hope, is the virtue of close attention to these texts; so often talked about and around – caricatured, even – but so little *read*. By doing justice to the subtlety and interest of the *Bridgewater* authors or a figure such as John Macculloch, we can recover the importance that a natural theological

²⁵⁷ Macculloch, III, p.4.

²⁵⁸ Ospovat, p. 33.

aesthetics might possess for our more general reconstruction of the intellectual and scientific history of this period.

Chapter II

Continued Developments in the Aesthetics of Design 1840-60

The Cuvier of the Paleyans – A Morphological Departure

In this chapter I explore the fate of CROE as it was developed through the middle decades of the nineteenth century, a period during which natural theological writing increasingly deployed morphological and idealist explanatory frameworks. Having explored how the teleological settlement between utility and beauty came apart in Paley's writing, and how several authors of the 1830s subsequently developed an aesthetic teleology within the aporetic framework of adaptive-functionalism, I now trace CROE as a durable structure of thought as it operated across a contrasting biological paradigm. Where even the stated opponents of the post-Paleyan tradition deployed a cognate aesthetics, I will explore how we can think an aesthetic teleology (adaptive purpose stripped of purpose) as subtending a whole series of distinctions used to conceptualise the history of natural theology and biology through the 1830s-50s, whether function or form, teleology or morphology, or typology and transformation. Through successive sections I explore how the tropes of philosophical anatomy were taken up both within and outside of the genre of natural theology during the 1840s and 50s, moving from the transcendental morphology of Richard Owen, to Hugh Miller's development of an idealist aesthetics of design across the 1840s, and building towards a reading of Whewell's theory of beauty in the *Plurality of Worlds* (1853).²⁵⁹ By showing how the aesthetic ends of divine design were linked to dysteleology and deployed to promote the claims of a morphological understanding of organic form, I use these readings to set the stage for a renewed understanding of the fatal doctrine of Kingsley's and Huxley's

²⁵⁹ Hugh Miller (1802-1856) was a Geologist and Palaeontologist whose evangelical beliefs inspired his publication of a series of natural theological texts in the 1840s and 50s.

aesthetic idealism at the beginning of the next chapter, and how Darwin was himself brought to respond to them.

The received narrative of the history of the British life sciences during these decades is that teleology gave way to transcendental anatomy, and, to once more advert to Ospovat's characterisation of this change, 'the rejection of the strictly teleological method of Cuvier and British natural theology' led to its supersession by a 'second variety' of perfect adaptation, far more under the sway of morphological or idealist modes of explanation.²⁶⁰ Desmond has explored in great detail how the importance of teleological explanation had waned in many circles by the late 1830s, and John Headley Brooke has even helpfully named the date for the imagined 'high point of natural theology in England': William Buckland's address to the British Association for the Advancement of Science on 23rd June 1832.²⁶¹ In this lecture, Buckland deployed the teleological functionalism of Cuvier's 'correlation of parts and the coordination of functions' as adjuncts to the otherwise largely orthodox arguments of Anglican natural theology, aiming to secure an alliance between the supremacy of functional explanation propounded by a leading scientific contemporary and the old certitudes of the design argument.²⁶² Yet, the contemporary report of Buckland's address is curious, as whilst the marriage of Cuvierian science and Paley was apparently complete, with 'comparative anatomy' acting as the 'powerful auxiliary' in demonstrating the 'inexhaustible richness of contrivance whereby Nature has adapted every animal to a comfortable and happy existence in the state wherein it was destined to move,' in its details Buckland's vision of design was not nearly this straightforward.²⁶³ Even here, at the alleged high-water mark of natural theological argument, criteria of increasing import for morphology – 'unity of design and unity of structure' – were deployed as the evidence for teleology by showing that 'all animal beings' had 'derived their existence from one and the same Almighty and Everlasting Creator.'²⁶⁴ However, the 'symmetry and harmony' Buckland gestured towards to evidence

²⁶⁰ Ospovat, pp. 115 and 34. For an outline of the major currents of biological thought during this period see Mario Di Gregorio, 'Zoology' in *The Cambridge History of Science, Volume 6: The Modern Biological and Earth Sciences*, ed. by Bowler and Pickstone (Cambridge: Cambridge University Press, 2009), pp. 205-242 (pp.207-214).

²⁶¹ Desmond, *Politics of Evolution*; John Headley Brooke, 'Scientific Thought and its Meaning for Religion: The Impact of French Science on British Natural Theology, 1827-1859,' *Revue de synthèse*, 110 (1989) 33-59, p. 39.

²⁶² *Ibid.*, p. 36. See also, *Report of the First and Second Meetings of the British Association for the Advancement of Science*, (London: John Murray, 1833), pp. 104-107. Dawson has provided commentary on this address at BAAS, especially Buckland's somewhat selective use of Cuvier's work. See *Show Me the Bone*, pp. 76 – 80.

²⁶³ *Report of BAAS*, p. 107.

²⁶⁴ *Ibid.*, p. 107.

compositional unity were not functional criteria of design in any immediate sense, representing forms of purposiveness could not be decoded in terms of direct adaptive function.²⁶⁵ Why would symmetry matter when function reigned supreme? What exactly did unity of design prove?

Different answers could be readily furnished by different thinkers, from Owen's archetype, to Darwinian common descent, to Buckland's own orthodox gloss, that general compositional unity was recuperable as divine fiat; 'showing' us that 'one and the same' mind was responsible for all organic form through all geological history.²⁶⁶ This was a venerable argument, with the same vocabulary of 'unity of design' as compositional signature used by, say, Kames to prove the same point back in 1774.²⁶⁷ Yet, as William Coleman has explored, Cuvier himself – the 'high priest of typology, and [...] champion of the fixity of species' – had a different answer regarding morphological unity, one that did not, emphatically, match Buckland's.²⁶⁸ For Coleman, Cuvier's rigidly typographic understanding of species followed from his rigidly teleological view of organisms as governed by the law of correlation of parts, where 'the functionally integrated animal, or specific type, could not significantly vary in any of its parts or operations without abruptly perishing, perishing precisely because it was no longer a fully and functionally integrated whole organism.'²⁶⁹ Unity was principally at the species level, and not at the level of a higher taxonomic distinction. We could compare species and discover the appearance of unity of design, but resemblance must be subordinated to function, as 'those animals within the same created type would naturally be functionally similar and therefore morphologically similar.'²⁷⁰ That general morphological unity was a function of an aesthetic-epistemic rationale operating in design (perhaps mediate functional), but with no typographic meaning relative to the organism itself, risked undermining the fundamental project of Cuvierian anatomy. Yet, this was just what Buckland was gesturing towards, and why Cuvier, and the reception and use of Cuvier in the anglophone world, is so useful for introducing the contention of this chapter, because it gives us an opportunity to explore how the fundamental explanatory criteria of morphology and

²⁶⁵ Ibid., p. 107

²⁶⁶ For Darwin's relationship to transformist modes of thought, see Robert Richards, *The Meaning of Evolution* (Chicago: University of Chicago Press, 1992).

²⁶⁷ *Sketches*, II, p. 370.

²⁶⁸ William Coleman, *Georges Cuvier, Zoologist* (Cambridge, M.A: Harvard University Press, 1964), pp. 97-8.

²⁶⁹ Ibid., p. 3.

²⁷⁰ Ibid., p. 156.

teleology interacted in such a way that an aesthetics of design could erode the distinction between them.²⁷¹ Not only is Cuvier's work revealed as more flexible than Coleman gave credit, but British natural theology is likewise revealed as possessing sophistications and problematics that have not heretofore been largely accredited. Beyond any narrative of monolithic and incompatible positions, a commerce of shared ideas remained, a theory of beauty foremost amongst them.

In this respect, beauty functions similarly to other concepts that historians of science have begun to understand as destabilising any strict division between teleology and morphology. The sense that specific theoretical elements might escape the gravitation of this dichotomy (or at least problematise it) is central to Gowan Dawson's *Show me the Bone*, which has explored the reception and afterlife of Cuvier's thought in Britain and America by following one of its pieces as it was extracted, deployed and transformed – 'the law of correlation,' that is, the claim that all aspects of a being are functionally adapted as parts to a whole, and as a whole to an arena of existence.²⁷² For the palaeontologist, a fragment of bone allows for the reconstruction of the whole of the organism that it once formed a part of, or so the logic goes. Quite aside from the specific cultural fragment used to reconstruct the long dead whole, Dawson's account has shown the leverage that following a single concept can offer, especially as the same tropes could function across varying paradigms, and had analogous uses within such paradigms. Apparently inviolable distinctions are revealed as porous at this level of detail, which must lead us to examine those distinctions as they have been previously narrated. So, against Desmond's argument for the apparently orthodox use of Cuvier (as Buckland above) and whatever the enthusiasm for Cuvier displayed by certain natural theologians in the 1820s, such a 'simple dichotomy' cannot suffice, with 'the same scientific theory' understood as supporting 'divergent political and theological meanings.'²⁷³

²⁷¹ Toby Appel has explored this confrontation as it reached its apex in the Cuvier-Geoffroy debate. Subsequently, however, French authors largely took up compromise positions through the 1830-40s, and so the historical 'interpretation of the debate as a conflict between a morphological and teleological view of nature, an interpretation suggested by Owen, derives not from the French but from the British context.' The teleological problems of morphology and adaptive design followed upon the specific circumstances of British thought and its theological heritage. See, Toby Appel, *The Cuvier-Geoffroy Debate* (Oxford: Oxford University Press, 1987), pp. 203-5.

²⁷² *Show me the Bone*, p. 3. Although Cuvierian correlation has an affinity with the concept of correspondency, correlation refers to the functional integration of organisms, rather than the totality of the universe itself as a web of interrelated adaptations. Correspondency comprehends within itself localised correlations.

²⁷³ *Ibid.*, p. 75.

For example, the 'first translations' of Cuvierian science were attractive to the avowed opponents of establishment natural theology during the Napoleonic wars, 'marketed to medical students and Whig radicals' and thereby 'initially perceived in Britain as espousing a dangerous, atheistic materialism.'²⁷⁴ On the other hand, this 'same Cuvierian law [...] was espoused by Anglican Oxford dons upholding the natural theological argument from design,' and such 'anatomy could be perceived, without inconsistency, as supporting diametrically opposed viewpoints.'²⁷⁵

In keeping with the need to maintain the appearance of orthodoxy to deploy Cuvier's scientific cachet in the service of design, when Cuvier's *Règne Animal* (1817) was translated into English (1827-35), his translators (principally Edward Griffith) had offered an apology for Cuvier as design theorist in the preface to the first volume.²⁷⁶ As Griffith wrote, a 'serious charge has been brought against zoological science as delivered to us by the sçavans of Germany and France: it is asserted that it has been made a vehicle for the insidious poison of infidelity.'²⁷⁷ Although Griffiths confessed that Cuvier's work 'has been perverted to such a purpose,' he remained equally 'certain' that 'it has no natural adaptation to such an end.'²⁷⁸ The intellectual climate in which Cuvier was understood was so intimately bound to the concept of adaptation that it became a hermeneutic category, and recursively, where the ultimate goal of Cuvierian science was the discovery of adaptations and therefore the traces of design, Cuvier must always 'stand clearly acquitted of such a charge [of infidelity].'²⁷⁹ Correlation reinforced the generalised logic of adaptation it was both read by and in support of. If there could be any doubt, the close of Griffith's exordium made it unmistakably clear; this was Cuvier deciphered in terms of Anglican natural theology and given a homiletic gloss:

It is not the heavens alone that "declare the glory of God," nor the firmament only "which sheweth his wondrous works." His omnipotence, his wisdom, and his superintending providence, are equally

²⁷⁴ Ibid., p. 6.

²⁷⁵ Ibid., pp. 9 and 23.

²⁷⁶ The gentleman amateur Edward Griffith (1790-1858) was a Lawyer, naturalist and founding member of the *Zoological Society*.

²⁷⁷ Georges Cuvier, Edward Griffith, et al., *The Animal Kingdom*, 16 vol (London: William Clowes, 1827-35), I, p. xi.

²⁷⁸ Ibid., I, p. xi.

²⁷⁹ Ibid., I, p. xi.

manifested in the meanest worm that creeps upon the earth, and in the lowest of the radiated tribes that slumber in the coral caves of ocean.²⁸⁰

The best apology for Cuvier was to make Cuvier into a natural theologian, formulating the claim that Cuvierian functionalism was, by and large, the same argument as offered by the long British tradition of Ray, Derham and Paley. Certainly, as Paley is generally understood, there doesn't seem much that is at odds with Cuvierian functionalism, as divine design ensures that all aspects of an organism are motivated by contrivance to adaptive function. Cuvierian typology was read to imply a rigid, teleologically defined species concept *without* the gradation between natural kinds that comparative anatomy might seem to gesture towards.

Yet, once again, this was *not* the full argument that had been offered by Paleyan natural theology, and amongst the many additions made to the *Règne Animal* by Griffith and his colleagues, the same question of aesthetic purposiveness as it conflicted with function intruded, turning Cuvierian theory into something other than the straightforward claim to the supremacy of function. Take the case of the Argus pheasant (*Argusianus argus*), an example, which given the later context of its use by the Duke of Argyll in his 1867 critique of Darwin and its ensuing centrality in Darwin's *Descent* (1871), is hugely important for any history of the life and afterlife of natural theological approaches to beauty.²⁸¹ Cuvier had offered a terse account of the 'extraordinary appearance' of the Argus pheasant, and, other than the briefest description of its plumage, provided only the laconic addition that such form '*donnent à l'oiseau un aspect tout-à-fait extraordinaire* [gives the bird a totally extraordinary appearance].'²⁸² However, in their translated and enlarged edition, Griffith et al. provided an extended account of the form of the Argus, interpolating a translation of a passage written by the ornithologist Coenraad Jacob Temminck (1778-1858) as it went to great rhetorical lengths to offer a sense of beautiful form well beyond any consideration of functional rationality, perhaps even *any* rationality:

We shall not attempt to enlarge on the description of the argus, in the text. In fact, no language could represent the various tints, and demi-tints, and shades that prevail throughout its plumage. It would

²⁸⁰ Ibid., I, p. xi.

²⁸¹ See pp. 179-80 and 196-204 below.

²⁸² Georges Cuvier, *Règne Animal*, 4 vols (Paris: Deterville, 1817), I, p. 445.

seem as if Nature, after having lavished, and, as it, were exhausted, all her brilliancy of colouring on so many birds, had taken a pleasure in assembling upon this every variety of her soberer hues; unsatisfied with having charmed our sight with the resplendency of purple, gold, and azure in the peacock, the bird of Paradise, and the humming-bird, she appears desirous of revealing to us all the resources of her art, by producing the most elegant and harmonious shades even from the refuse of her inimitable pallet.²⁸³

The 'extraordinary aspect' had been intensified to the point that only the topos of inexpressibility would suffice, with the Argus pheasant existing as a reflexive revelation of the 'resources of art.' Certain organic form, composed from an excess or 'refuse' that had no other purpose, not only exceeded functional explanation, but was produced only for the sake of an expression of formal virtuosity within design itself.

The Argus pheasant was not an isolated case amongst the additions that Cuvier's translators made, with, for instance, an original passage on the beauty of the Peacock (*Pavo cristatus*) written into the skeleton of Cuvier's classification and description and then prized explicitly as a purposeless purpose:

we do not see, for our own parts, why nature, who does nothing in vain, should clothe any of her animated and sensitive productions in such resplendent beauty, unless it was intended as a source of enjoyment to themselves, or their kind. It is rather too much to assert, that it was for the purpose of pleasing the eye of man alone that she produced this *chef d'œuvre* of the feathered race. She has filled with music, and with loveliness, the trackless forest, and the mountain-wild, where his voice has been never heard, where his footsteps have never penetrated.²⁸⁴

Here then, inserted into Cuvier's work, was the fundamental form of CROE, with 'resplendent beauty' of form purposive only for aesthetic 'enjoyment' and no other function. Moreover, such form had no intrinsic relationship to human knowledge or enjoyment; no longer linked to 'the purpose of pleasing the eye of man alone,' but framed as an order of aesthetic purposiveness out in the world at large. The existence of such beauty not only challenged the supremacy of function, but even challenged a narrative of human exceptionalism as a way of recovering a *telos* for aesthetically pleasurable forms. Strangely, then, Cuvier's translators seemed close to the position that Darwin would one day take up, that the pleasures of

²⁸³ *The Animal Kingdom*, VIII, p. 238; Coenraad Temminck, *Histoire Naturelle Générale des Pigeons et des Gallinacés*, 3 vols (Paris: Dufour, 1813-15), II, p. 423.

²⁸⁴ *Animal Kingdom*, VIII, p. 145.

aesthetically purposive organic form seemed to demand the posit of a corresponding subjectivity within the organisms it was designed to delight.

Cuvier's work was embroiled in the paradoxes of aesthetic dysteleology, with his translators availing themselves of that good Aristotelian maxim that 'nature does nothing in vain' in order to prize a purpose that was, thought from any strict paradigm of teleological functionality, just that. Even an approach that lauded the supremacy of function was now charged with the resources of its ostensible opposite, and where post-Paleyan natural theology contained within itself a teleological rift, the vagaries of the reception, translation and appropriation of Cuvier itself now charted the story of this paradox. The same instability was inscribed into Cuvier's thought itself. Yet, Cuvier's transformation by his English translators was even odder still, as the use of this same maxim in the *Animal Kingdom* charts how an ever-broader definition of what counts as purposiveness was capable of enfolding even those authors whose work has been claimed as hostile to functional teleology. The assertion that nature does nothing in vain was recycled to incorporate the authority of Geoffroy – Cuvier's great antagonist – as he offered extended discussion of the anatomy of bats where Cuvier's account was lacking. Geoffroy's anatomical research, otherwise trending away from teleological explanation, could be theologically glossed and recovered for adaptive function, where, discussing the 'remarkable' or 'singular' flight membranes of certain species of Flying-Fox (*Pteropus sp.*), Griffith et al. noted that 'an arrangement of this kind must have for its final cause the advantage and comfort of the animal in which it occurs. The Deity does nothing in vain, nothing without a benevolent purpose.'²⁸⁵

The intellectual authority of a figure later seen as challenging the explanatory criteria of functional teleology, was ventriloquised as a spokesperson of natural theology. Such eclecticism was made possible by a teleology operating at the credible limits of what a function might be. Geoffroy was sanitised, and made a deputy of Cuvier, but, at the same time, the teleological foundation of Cuvierian typology weakened by the inclusion of functionless criteria of adaptation. Cuvier had been made to speak to a logic of adaptation that did not just prize functional adaptation, but undercut Cuvier's own claims to the supremacy of function by foregrounding the operation of a purposiveness without purpose latent within the Paleyan tradition. Likewise, Geoffroy was claimed for an adaptational logic

²⁸⁵ *The Animal Kingdom*, II, p. 111.

that only really cohered with Geoffroy's thought when functional teleology was emptied of any determinate function. Where the edifice of Geoffroy's thought was founded upon concepts like '*l'unité de composition*,' this typological unity of beings was a vehicle of transmutational thought, with the working out of individual forms a diachronic process that supervened upon the fundamental explanatory principle of morphological unity. As Geoffroy framed various laws of development and modification, '*dans cette latitude de moyens, se montrent les ressources admirables de la nature, son indéfinie faculté dont nous avons parlé, pour modifier l'unité de plan et l'étendre à la diversité des forms* [in this array of means is revealed the admirable resources of nature, her indefinable faculty of which we have spoken, to modify unity of plan and extend it into diversity of forms].'²⁸⁶ If the originary unity of plan was adapted to be adaptable *as such*, and so made to be transformed, it might be recovered as function at a different level of explanation. This was not, as yet, something that Cuvier's translators had the means to work out. It was, however, exactly what Richard Owen would go on to argue twenty years later.

Cuvier was transformed through the concerns of an autochthonous natural theological aesthetics which prized a dysteleology of aesthetic adaptation that effectively undercut Cuvierian function. Thus, where Cuvierian functionalism was read in terms of the purposive without purpose, it became a hybrid theory somewhere between rigid teleological determination and *something else*, a something else which was, considered teleologically, contiguous with morphological views of design. As I will explore, the tension that already existed within the Paleyan argument as it offered an aesthetics was not only recapitulated, but this secondary teleology now won out as the overarching image of design. Design moved from a functional rationality of the contrivance or artefact towards the prizing of a kind of purposeless purpose as the default state of teleology. CROE, as the widespread and interrelated set of arguments and conceptual resources needed to think the teleology of aesthetic form above function, offered a way to make a diverse range of thinkers – from Cuvier to Geoffroy to *Naturphilosophie* – part of a theologically palatable synthesis.

The following sections commence with a discussion of the most famous of the British authors who made that synthesis palatable, Richard Owen, providing analysis of his *Nature of*

²⁸⁶ Étienne Geoffroy Saint-Hilaire, *Cours de l'histoire naturelle des mammifères* (Paris: Pichon et Didier, 1829), '21st Mai, 1828,' p. 23. Translation my own.

Limbs (1849), in part as a clear expression of transcendental morphology, but primarily because Owen's apparent abandonment of functional teleology instead recovered purposeless forms as a variety of adaptation. My work on Owen is less concerned with a direct theory of beauty, but charts how concepts like unity of design had the same teleological status as beauty, and therefore why a variety of aesthetic idealism borrowed from anatomical science could become so attractive to a range of natural theologians. Having outlined how the teleological themes stressed by the Paleyans of the 1830s were operating in their avowed opposite, I move to discuss how CROE, as a theory of aesthetic design, was developed in the 1840s-50s. My first protagonist is Hugh Miller (1802-1856). Miller's work, part of the popular evangelical reaction to transmutation, developed a Christian idealist typography of form, deploying the authority of Owen, but in direct contrast with Owen's own diachronic understanding of morphological unity. An adaptive model of beauty not only allows us to challenge the teleological distinctiveness of morphology and teleology, but helps us explore their interaction on a temporal register in the negotiation between a rigid typology and a process of transformation.

In the final section I turn to Whewell's *Plurality of Worlds* (1853), exploring how one of the most important figures associated with the logic of adaptation in the 1830s had increasingly integrated morphological and idealist biology into his work, and thereby offered a natural theological account of beauty. Through a conceptual move that took in the mathematics of beauty, a form of structuralism and the central tenets of transcendental morphology, beauty was generalised and aesthetic resources used to think the otherwise unthinkable totality of creation. The greatest evidence of design was no longer the meticulous adaptation of an organism to its environment, or any of the conventional tropes of natural theology, but the foregrounding of the pure form of purposeless finality ("designedness") in the beautiful natural object. Whewell's conversion from adaptive teleology to more transcendental themes is historically well attested, with his *Plurality* representing a marked change in emphasis in line with a changing scientific orthodoxy.²⁸⁷ Importantly, however, what has never attracted attention, and encapsulates the general thrust of my argument in this chapter, was that whilst Whewell's work marked a drift towards morphological

²⁸⁷ For discussion of Whewell's morphological turn, see Ospovat, pp. 140-143.

explanation, it nevertheless did not cancel the tradition of theories of aesthetic design offered by figures such as Paley, Chalmers or Macculloch. Beauty bridged the divide.

Richard Owen – The Purposive Without Purpose Returns to 'Teleology'

To tease out how transcendental anatomy related to the aesthetic teleology of Paleyan natural theology, I begin by discussing Richard Owen, who has been claimed as the most important figure in the nineteenth-century British life sciences besides Darwin; credited in his 'changing from functional to transcendental anatomy' for having 'placed the argument from design on a new footing.'²⁸⁸ However, despite his later status as the most influential of the British idealist biologists, Owen has always presented difficulties for historians attempting to narrate a straightforward shift from function to form, especially in his earlier years, and differing aspects of Owen's journey towards a full-blown transcendental morphology have been stressed by different readers. Owen himself had claimed to provide an explanatory synthesis of function and form, but for Adrian Desmond there was little real preservation of equivalency, with Owen's transcendental and morphological explanatory frameworks palpably eclipsing the role of teleological-functional explanations. In line with Desmond's overarching thesis, the political context of Owen's turn to morphology should be taken as decisive, with Owen the most important representative of a group of several figures who tamed the new continental morphology – 'a voice of moderation' – and made it acceptable to conservatives and theists of varying stripes, from the Coleridgeans through to the erstwhile Paleyan directors of venerable scientific institutions.²⁸⁹ Although, as Desmond has noted, in line with this meliorism 'Owen presented his program as an equal mix of transcendentalism and teleology,' such a view disguises the degree to which teleology would take a 'subordinate

²⁸⁸ Nicolaas Rupke, *Richard Owen* (Chicago: University of Chicago Press, 2009), pp. 1 and 141.

²⁸⁹ *Politics of Evolution*, p. 352.

status.’²⁹⁰ In short, this new settlement marked the ascendancy of a morphological model of design.²⁹¹

For Nicolaas Rupke, there was similarly a discernible ‘rift’ in Owen’s writing, a split representing ‘two epistemologies,’ themselves the epistemologies of ‘two constituencies, both of which were needed for the fulfilment of Owen’s institutional ambitions.’²⁹² Owen should be understood as adventitiously stressing either alternative depending on audience, with the ‘enduring epistemological duality’ of Owen’s work reflective of ‘an opportunistic running with the Oxford hares and hunting with the London hounds,’ focussing on ‘functionalist’ explanations for the sake of Paleyan dons and ‘transcendentalist’ explanations for London medical and anatomical circles, especially in his earlier years.²⁹³ Although, in line with his ‘ambitions,’ Owen attempted to keep colleagues happy on both sides of debate, Owen was one of many who saw the writing on the wall as the sciences professionalised, and ‘through the 1840s [...] had increasingly begun to side with the so-called philosophical anatomists, the followers of German *Naturphilosophie*.’²⁹⁴ As such, Rupke’s narrative is similarly predicated on the end of natural theology, which was taken to have ‘begun to crumble during the two or three decades which preceded *The Origin of Species*, as a generation of London naturalists abandoned the functionalist epistemology of the Bridgewater Treatises and switched to a different kind of scientific explanation, imported from Edinburgh and the Continent.’²⁹⁵

Against this more defined picture, one which tends to read morphology and functionalism as competing blocs, I suggest that we should read Owen within the context of a pre-existing debate concerning purposeless purposes in design, and that Owen was *using* the non-adaptive contrivance (functionless at the level of the organism itself) in the same way that had become widespread through the 1830s as a way of negotiating the paradoxes of adaptive teleology. To illustrate this point, I turn to *On the Nature of Limbs* to explore what might be drawn out of Owen’s work as it problematises the shift from adaptive teleology to transcendental morphology as the model of design, even in a text that might spontaneously

²⁹⁰ Ibid., p. 360.

²⁹¹ See Ibid., pp. 335-372 for discussion of Owen and the ascendancy of idealisms through the 1830s and 40s, whether *Naturphilosophie* or the Coleridge circle.

²⁹² Rupke, p. 53.

²⁹³ Rupke, pp. 103 and p. 53.

²⁹⁴ Rupke, pp. 53 and 90.

²⁹⁵ Ibid., p. 91.

appear as one of the clearest expressions anatomical idealism against functional teleology. As Owen begins in the *Nature of Limbs*, the fundamental postulate of transcendental anatomy is that every part of a being has a '*bedeutung*' [sic.] or 'essential nature,' which is to say its 'essentiality which it retains under every modification of size and form.'²⁹⁶ Every anatomical aspect of a being can be thought in reference to an idealised signification of which it is a transformation. Type was no longer equated to the adaptively integrated Cuvierian species-concept, but a general form of which all species are the modification. This idealised signification is somehow real, representing an overarching idea or *Bauplan* that has an archetypic intellectual nature in the mind of the creator, with Owen making explicit reference to the 'idea' of the 'Platonic cosmogony' to give such concepts explanatory context.²⁹⁷ Along these lines, Owen's *Bedeutung* or 'essential nature' was associated with another similar key concept – 'general homology' – here expressed in terms of the general homology of the vertebrate skeleton, that every part of every vertebrate body can be thought as homologous modifications of a single originary plan or archetype.²⁹⁸

Whatever apparent diversity of form inheres across a broad taxonomic division (here the vertebrates), every aspect of their anatomy remains a homologous instantiation of a single *Bedeutung*, expressed as a totality within the ideal archetype. Function, or the constraints of function, can only ever supervene upon this fundamental ideality, and along those lines Owen set transcendental morphology directly against the explanations of the 'teleologist:' those 'animated in [their] researches by the quest of final causes in the belief that they were the sole governing principle of organization.'²⁹⁹ For Owen, explanations of form could no longer be constrained by 'the principle of special adaptation,' but must posit a series of homologous 'correspondences' of living form which exist as 'manifestations of some archetypal exemplar on which it has pleased the Creator to frame certain of his living creatures.'³⁰⁰ Yet, instanced in this very gesture against teleology, we see the key logic of the archetype as it takes on a later importance for a reformed teleology of design, with the 'archetypal exemplar' – the pseudo-Platonic idea in the mind of God – becoming a result of an outwardly arbitrary willing. Owen's discussion of the archetype actively assumed divine

²⁹⁶ *Limbs*, p. 2.

²⁹⁷ *Ibid.*, p. 2.

²⁹⁸ See *ibid.*, p. 64.

²⁹⁹ *Ibid.*, p. 10.

³⁰⁰ *Ibid.*, p. 40.

fiat, apparently abandoning any attempt to rationalise the specific form that the archetype or *Bauplan* instantiated.

This logic was clearly exemplified in Owen's slightly earlier *Archetype and Homologies of the Vertebrate Skeleton* (1848), a more professionally oriented treatment of the same themes of the *Nature of Limbs*. Here Owen picked up on the less than rigorous use of morphological themes (notably 'unity of plan') within the narrower generic tradition of natural theological texts, and the failure to interrogate what gestures to unity actually implied:

The evidences of unity of plan [...] are readily recognised by the tyro in comparative osteology in the ape, the horse, the whale, the bird, the tortoise and the crocodile. The beautiful simplicity of the fundamental basis of all these adaptations of structure is descanted upon in all our popular teleological treatises. But the higher law governing the existence of these special homologies has attracted little attention in this country.³⁰¹

The first key importance of unity of plan was that it gestured towards the idea of a 'higher law,' with the archetype thereby offering a way of thinking a greater generality of structure under the concept of natural law than any 'tyro' espousing teleological explanation. However, this same search after lawfulness itself uncovered a fiat that couldn't be rationalised, becoming the 'inquiry into that more general principle of conformity to type according to which it has pleased the Creator of organic forms to restrict the manifestations of the variety and proportion and shape.'³⁰² Only on this foundation could we discover the subsequent 'manifestations' of 'whatever adaptive modifications it may be subjected.'³⁰³ Where these modifications represent the realisation or materialisation of the archetype as it was actually encountered in the world, these secondary teleological determinations had the effect of *masking* the essential structure of a being as it was captured in the idea of a *Bedeutung*. Indeed, Owen went as far as to claim that the 'archetypal plan' was 'obscured by teleological adaptations,' with the error of utilitarian finality intellectually seductive because secondary teleological form concealed the essential structure of a being.³⁰⁴ A morphological science

³⁰¹ *Archetype*, p. 127.

³⁰² *Ibid.*, p. 127.

³⁰³ *Ibid.*, p. 127.

³⁰⁴ *Ibid.*, p. 48.

honed out capacity to grasp transcendental forms as ‘definable and recognisable under all their teleological modifications,’ with ‘their essential relations and characters appearing through every adaptive mask.’³⁰⁵

Adaptation, then, is something like a surface: phenomenologically immediate, but necessitating the difficult work required to demonstrate the ‘inadequacy of the teleological hypothesis,’ behind its superficially attractive ‘mask.’³⁰⁶ Yet, in this search after a greater generality of law, Owen’s account ran into the fundamental arbitrariness this very law implied: there was no longer any reason for the form the archetype took beyond fiat. This was the Achilles’ heel of Owen’s theory, as the purposeless purpose of Owen’s archetype – as a direct function of design – implied just as much teleology as the ‘Teleology’ it claimed to obviate, but simultaneously rendered such teleology not only arbitrary (existing only insofar as it has ‘pleased’ the creator), but perhaps even unthinkable.³⁰⁷ All design – the totality of the world – was brought within the ken of what had initially been phrased as a more limited debate regarding the teleological problematic of morphology, and at the close of the *Nature of Limbs* Owen directly faced up to this problem by trying to resolve the question of teleology linked to functional adaptationism with the ‘apparently superfluous’ form posited by his own account of Design.³⁰⁸ Curiously, however, Owen’s claimed means of resolution have already been encountered, both in exponents of morphology over against teleology (Geoffroy’s ‘*ressources admirables de la nature*’ for shaping typological unity into diversity), but also in figures such as Chalmers or Macculloch, who theorised the purposeless purpose as possessing an aesthetic-epistemic function in revealing the “designedness” of the contrivance. Granted, in the *Nature of Limbs* Owen did not phrase this return to adaptive purposiveness by expressly aesthetic means, but developed an analogous argument through idea that the ‘superfluous’ form of the archetype had an epistemic function, one directly linked to the perceived failure of an understanding of the organism in terms of functional adaptation.

Initially, this might seem paradoxical, but Owen saw the failure of natural theological technical analogy as the route by which we must expand our understanding of what purposive form might be. Owen had already discussed the disanalogy between the teleology of organic

³⁰⁵ Ibid., p. 170.

³⁰⁶ Ibid., p. 73.

³⁰⁷ *Limbs*, p. 40.

³⁰⁸ Ibid., p. 84.

form and the technical object at the beginning of the *Nature of Limbs*, but here, the link between this apparent failure and a second-order teleology was made explicit:

The fallacy perhaps lies in judging of created organs by the analogy of made machines; but it is certain that in the instances where the analogy fails to explain the structure of an organ, such structure does not exist 'in vain' if its truer comprehension lead [sic.] rational and responsible beings to a better conception of their own origin and Creator.³⁰⁹

All apparent exceptions to meaningful design could be recuperated as epistemically purposive, and so the apparent lawlessness of divine fiat was made teleologically rational. Although Owen's negative phrasing ('does not exist in vain if') itself confesses the problem of purposelessness, the archetype was still somehow redeemed *because* it was a purposeless purpose, with Owen providing a rather elliptical illustration of this theoretical construction by quoting from Coleridge's 'Religious Musings' ('Tis the sublime of man,/Our noontide Majesty, to know ourselves/Parts and proportions of one wondrous whole!').³¹⁰ Although not explicitly framed in terms of an aesthetic rationality, Owen's use of poetry to think the otherwise unthinkable represents an example of a trend that became more and more noticeable through the 1840s and 50s, namely, an aesthetic turn *within* anatomical idealism to think the teleology it both implied and disavowed. As I will discuss in further sections, this aesthetic turn – teleology cognised through beauty rather than functional *technē* – was understood as reflecting the underlying logic of design itself, with authors taking up poetic and artistic form as a means for gaining renewed intuition of the teleological framework that underpinned all creation.

That Owen wanted to cultivate the image of himself as having offered a new way forward for biological teleology was made clear in an anonymous account of Owen's work written by Owen and his ally William Broderip in the *Quarterly Review* of June 1853.³¹¹ Owen not only praised his own importance in the third person, but tried to narrate its significance relative to the imagined rift that inhered between teleology and morphology, writing that 'his

³⁰⁹ Ibid., pp. 9-10 & p. 85.

³¹⁰ Samuel Taylor Coleridge 'Religious Musings' in *Poems on Various Subjects* (London: for G.G and J. Robinsons and Cottle, 1796), pp. 139-168 (141-3).

³¹¹ [Richard Owen and William Broderip] 'Generalizations of Comparative Anatomy.' *Quarterly Review*, 93 (1853), 46-83.

great aim has been to put an end to the old controversy so obstinately maintained on the presumption that a special adaptation of parts was incompatible with a common type of construction.³¹² To this end, Owen quoted back his own work in *Nature of Limbs* – indeed, the very same passages as immediately above – glossing their ultimate aim as nothing less than a ‘teleology of a higher order,’ a teleology thought in direct opposition Cuvierian functionalism, but able to ‘furnish new arguments in support of the highest attainable truths.’³¹³ That is to say, design was understood as epistemically purposive *for us* in allowing us to know the divine archetype, but the archetype, considered in itself as an abstract but real *Bauplan*, was bereft of functional teleological determination. Type and *telos* came apart at one register, but were reunited on another. However, as will be clear by now, despite Owen’s narrative of his work as offering a novel resolution of the teleological problematic of design, not only was the division between teleology and morphology not nearly as insuperable as Owen lead his readers to believe, but his solution deployed the logic that had always revealed their division as permeable. Owen’s very argument for a ‘teleology of a higher order’ had already been developed in the Paleyan tradition as a way of making excessive form and its pleasures epistemically purposive (recuperating any apparent affront to function). Indeed, even Cuvier’s work was marked by this logic as it was appropriated in the service of anglophone natural theology through the 1820s and 30s.

So, although Owen’s work of the late 1840s might appear to finally spell an end to the continued relevancy of Paleyan teleology, and has certainly been read as doing so (i.e. Rupke or Ospovat as above) these same ways of exploiting the failure of *technē* as a suitable analogy for design reinvigorated otherwise occluded aspects of the Paleyan tradition. Owen’s recursive claims were misleading, if not disingenuous, and despite Owen’s argument against the supremacy of teleological explanation, we should understand that Owen – at least as it concerned the teleology of design – was not actually saying anything particularly different to the authors he was writing against. Where Owen implied that the default state of design was a purposeless formal unity upon which functional teleology only ever locally supervened, he offered a teleological position analogous to Macculloch’s, albeit for subtly different reasons (in Macculloch’s case, that aesthetic purposiveness was the teleological framework of design).

³¹² Ibid., p. 80.

³¹³ Ibid., p. 80.

At least as I read the *Nature of Limbs*, I take Owen's claim as being that general morphology could offer means to comprehend Paleyan teleology as a limiting case, but this relationship was asymmetric, with teleology unable to offer resources to comprehend general morphology. Where the archetype allows us access to the mind of God and the plan of design, teleological specificity can only ever be the material realisation of an originary purposiveness without limiting purpose. Thought typologically, Cuvierian types now represented so many individual transformations of a primordial unity. Form otherwise shorn of function was the underlying teleology of design, revealed without the 'mask' – as Owen put it – of determinate use that conceals the 'essential nature' of the *Bauplan*.³¹⁴ Yet, as we have seen, this cannot be the whole truth of the relationship between these avowed alternatives, specifically because the idea of a purposiveness without purpose (the designed archetype) was also discovered in the teleological form of the aesthetic. This was not just the same problem as encountered by Paley, Chalmers or Macculloch, but a cognate solution, and so focussing on an aspect as apparently remote as the teleology of natural theological aesthetics provides good reason for reconsidering certain granular narratives regarding the history of the life sciences through the middle decades of the nineteenth century.

To close with my account of Owen, and as a link to my discussion of Miller, I now turn to the ending of *Nature Of Limbs*, outlining how transcendental archetype (as atemporal unity of plan) related to species-types and temporality, showing that morphological idealism – design as the purposive without purpose – could be taken as compatible with a theory of transmutation as the unfolding of this architectonic. Although somewhat orthogonal to my previous line of argument as it concerns the static teleology of utility or non-utility, it is important to remember that approaches directly critical of functionalism (anatomical idealism) were often linked to transmutation theory, or the immanent evolution of finality in nature.³¹⁵ Both French morphology (i.e. Geoffroy) and *Naturphilosophie* (i.e. Oken) had theorised some kind of transmutational or developmental hypothesis, and, as evidenced by works such as Chamber's *Vestiges* (1844), heterodox Anglophone approaches to design hypothesised a similar mechanism of species development.³¹⁶ The close of Owen's *Nature of*

³¹⁴ *Limbs*, p. 2.

³¹⁵ See *Meaning of Evolution*.

³¹⁶ [Robert Chambers], *Vestiges of the Natural History of Creation* (London: Churchill, 1844). See also, See Lorenz Oken, *Elements of Physiophilosophy*, trans. by Alfred Tulk (London: Adlard, 1847).

Limbs had itself made this leap, albeit in veiled terms, by figuring the history of life as the diachronic unfolding of the synchronic or ahistorical archetype through secondary law. For Owen, the relationship between undifferentiated essence and individuated manifestation implied by idealist biology already was a kind of transmutation, making the fundamental postulate of the unfurling of design that 'the divine mind which planned the Archetype also foreknew all its modifications.'³¹⁷ Differing specific forms representing variations on the theme of a single plan were produced by 'natural' or 'secondary laws':

The Archetypal idea was manifested in the flesh, under divers such modifications, upon this planet, long prior to the existence of those animal species that actually exemplify it. To what natural laws or secondary causes the orderly succession and progression of such organic phaenomena may have been committed we as yet are ignorant. But if, without derogation of the Divine power, we may conceive the existence of such ministers, and personify them by the term 'Nature,' we learn from the past history of our globe that she has advanced with slow and stately steps, guided by the archetypal light, amidst the wreck of worlds from the first embodiment of the Vertebrate idea under its old Ichthyic vestment, until it became arrayed in the glorious garb of the Human form.³¹⁸

In this sweeping vista of geological time, the history of the world was read as the history of the incarnation and development of the vertebrate body-plan, with the movement from the fish to the human revealed as the succession of various surface instantiations of the same archetype. Whatever such laws were, transcendental anatomy was interpreted as pointing towards the history of life as the long unfolding of a telos *of* the purposeless purpose represented by the 'archetypal light' of the 'Vertebrate idea.' At the closure of this narrative of a moral and intellectual telos of the *Bauplan* in the 'glorious garb of the Human form,' we are returned to Owen's own profession of a higher teleology, that such apparently useless detours as they have 'pleased the Creator' cannot be in vain when they 'lead [sic.] rational and responsible beings to a better conception of their own origin and Creator.'³¹⁹ As Hutcheson had long ago posited as characteristic of the beautiful form of living beings – a 'beauty' founded on the 'uniformity of parts' or 'uniformity of mechanism,' itself 'applied with inconceivable diversities to answer [different] ends' – in Owenian transcendental morphology

³¹⁷ *Limbs*, p. 86.

³¹⁸ *Ibid.*, p. 86.

³¹⁹ *Ibid.*, pp. 40 and 85.

the basic teleological architecture of organic form was itself now comprehended in terms of a kind of uniformity amidst variety as its central motivation.³²⁰ Within this system, adaptive function was only one such instance of use to which the otherwise useless could be put; a variation that was, *qua* variation, itself irreducible to utilitarian rationality.

Hugh Miller on the Beauty of Design – A Homegrown Idealist Aesthetic?

In this section I explore how the leading themes of anatomical idealism were worked out in more generically proper natural theological texts of the 1840s, a decade which saw the design argument shift in parallel with the growing morphological trend of the biological sciences. During this period, a growing idealism was visible within even more popularly oriented and conservatively inclined works, exemplified here in the writing of Hugh Miller, whose *Sandstone* (1841) and *Foot-prints* (1849) had made explicit attacks on such *bête noires* as 'Chartist meetings,' Lamarck, the *Vestiges* and the 'development hypothesis.'³²¹ Despite the popular emphasis of these works, they remained in possession of a more properly scientific readership too, both read by Darwin, for instance, not long after their initial publications.³²² Curiously, although Miller's work was squarely set against transmutation, it was not aimed against Owen, and, as I shall discuss, in the *Foot-prints* took direct inspiration from the *Nature of Limbs*, with the irony of deploying Owen's authority against a development hypothesis apparently missed. Although Owen hinted towards a transmutational hypothesis in the closing passage of the *Nature of Limbs*, biological idealism did not, evidently, necessitate evolutionary sympathies, with morphology easily enfolded within less heterodox forms of the design argument. Miller's work reveals another way by which (non-functional) morphology and (functional) type could be synthesised, with Miller developing a Christian-Platonist typology of species that rethought anatomical idealism as an aesthetics of natural kinds. The

³²⁰ Hutcheson, p. 44.

³²¹ *Sandstone*, pp. 26 and 63; *Foot-Prints*, pp. 256-273.

³²² See CUL-DAR119.12v & 22v.

otherwise unmotivated variations of unity of design became aesthetically purposive. Thus, the work of Owen and Miller represent two divergent temporal interpretations of the postulates of transcendental morphology, thought either as the diachronic unfolding of the ideal *Bauplan* in its manifold variations, or, in Miller's case, as an atemporal ideal in the mind of God that captures the otherwise purposeless essence of creation as a unitary aesthetic composition.

The looming context of Miller's writing was the growing popularity of transmutational argument, and in 1844 Chambers's *Vestiges* electrified the British reading public, with otherwise staid tropes regarding 'divine creation' offered 'topical frisson for the first time in years,' whether in Chambers' own treatment of them, or, in the case of Miller's *Foot-prints*, as part of the reaction against them.³²³ It was within this cultural setting that geology, and the possible evidences of the fossil record, became the privileged terrain upon which to combat the claims of transmutational design.³²⁴ As Miller could write, even several years before the appearance of the *Vestiges*, 'geology abounds with creatures of the intermediate class: there are none of its links more numerous than its connecting links; and hence its interest, as a field of speculation, to the asserters of the transmutation of races.'³²⁵ For Miller, the key fault of thinkers such as 'Lamarck' or '[de] Maillet' was to 'confound gradation with progress,' and so to read similarity in form as a function of genealogical affiliation rather than unity of plan as the common atemporal ideal that informed their separate creation. Yet, although unity of design was deployed to defeat progression, the problem of successive forms and 'connecting links' remained. The realities of geological time had to be accounted for, and so, as Miller characterised the 'truth' of the divine system through a Miltonian intertext, whatever its irrefragable unity, the divine plan was still experienced in time as 'hewn in pieces,' and its 'limbs scattered over distant regions.'³²⁶ Such fragments must be discovered through history as if it were space rather than time, with Miller's faith remaining that 'the perfection of the works of the deity is a perfection entire in its components, and yet these are not contemporaneous, but successive: it is a perfection which includes the dead as well as the living, and bears relation in its completeness, not to time, but to eternity.'³²⁷ We have to

³²³ James Secord, *Victorian Sensation* (Chicago: Chicago University Press, 2003), p. 164.

³²⁴ *Sandstone*, p. 66.

³²⁵ *Ibid.*, p. 67.

³²⁶ *Sandstone*, p. 69.

³²⁷ *Ibid.*, p. 69.

think the temporal as spatial, and see a diversity of individual instantiations of generic forms as so many aspects of a single system in 'eternity' – an atemporal structure or totality – rather than interpreting these interrelated fragments of diachronically graded form as unfolding by their own immanent resources in time.

Thus, as I developed last chapter in the distinction between the synchronic and diachronic significance of adaptation, and now seen re-emerging in Owen's and Miller's disparate representations of unity, the relationship between two temporal orders – history and eternity – was the crossroads at which multiple conceptualisations of the teleological structure of design overlapped and diverged. Nowhere was this temporal aspect more pressing than in aesthetics, especially where beauty was thought of as an intrinsically relational property that inhered between a spectator and their proper objects (CROE). Miller's challenge was to understand the deep time of geology *aesthetically*, especially when, in the case of fossils and their purported beauty, species were created as aesthetic artefacts when there were no subjects present to take delight in their beauty. Miller phrased this problem in terms of an ontological analogy with human art, noting that long extinct species were each a 'piece, destined, perhaps, never to come under the eye of a connoisseur.'³²⁸ Geological time tested the limit of CROE as a way of thinking about aesthetic purposiveness as intrinsically relational. However, this same problem provided an opportunity to extend the reach of CROE by mounting claims about God's own status as an aesthetic agent that found enjoyment in form. As I will explore in this section, Miller moved to frame creation as a reflexive aesthetic self-relationship through the mediacy of material form, and thus maintained the relational structure of aesthetic properties. Beauty was not primarily for-us, but literally for-God. Natural theological aesthetics could be updated, and deployed within the context of morphological idealism, doing so, in the case of Miller, with the historical resources of anglophone aesthetics, notably Joshua Reynolds. By understanding nature as God's self-relation through aesthetic form, natural theology could assume and deploy morphological tropes to evidence the 'unity of one grand harmonious design' that possessed, by the coherence traced through the homologies of organic form, the 'character of unity which speaks of the single producing mind.'³²⁹

³²⁸ Ibid., p. 120.

³²⁹ *Foot-Prints*, pp. 283 & 300.

Where previous attempts have been made to characterise natural theological aesthetics, Hugh Miller has been noted as one of the exemplary figures of the nineteenth century.³³⁰ Specifically, Brooke and Cantor have focussed on Miller's use of architectural metaphor to conceptualise the aesthetics of design (especially as geometric beauty), taking up Miller's *Testimony of the Rocks* (1857), where, as they parse Miller's claims, given that 'the same architectonic principles were visible in their work and that of their Maker [...] they evidently shared the same aesthetic sensibilities.'³³¹ Certainly, Miller availed himself of this traditional argument, with the intuition of design sanctioned by an ontologically strong analogy between human art and divine art cashed out in terms of the aesthetic, with Miller positing an explicitly 'aesthetic [...] identity' between humanity and God discovered in the appreciation of the beauties of natural forms.³³² However, the architectural figuration of this aesthetic identity is more important in its specificity than Brooke and Cantor give it credit, allowing Miller to link the classical Paleyan themes of an ontological analogy between human and divine *technē* with a morphological reading of unity of design as it gave secure meaning to non-utilitarian adaptation. In gesturing towards the idea of an 'architectonic,' Brooke and Cantor have hinted at this deeper meaning without exploring its fullest ramifications, with the divine Architect or demiurge – one of the oldest tropes for cognising the world as designed – redeployed in nineteenth-century thought to understand novel issues in palaeontology, the life sciences and beyond.

Following the trail of the architectonic, the *Testimony* was neither the first nor the clearest text in which Miller had put forward an architectural figuration of the divine aesthetic materialised in creation, and to begin, I turn to an earlier juncture, with Miller's use of the trope in *Sandstone* during the first years of the 1840s.³³³ In the fifth chapter of *Sandstone*, Miller offered a description of certain 'ichthyolites' (fossil fish) of the Lower Old Red Sandstone [Upper Silurian to Lower Devonian c.425 – 395 Mya], but what began as a discussion of the classification of ichthyolites turned instead to the intersection between the diversity of form that underpins any classification and the aesthetic considerations of design it directly implies. The idea of variety as its own unique mode of aesthetic purposiveness has

³³⁰ Brooke and Cantor, pp. 224-226.

³³¹ Brooke and Cantor, p. 226.

³³² See Hugh Miller, *The Testimony of the Rocks* (Edinburgh: Constable, 1857), pp. 237-242.

³³³ The aestheticizing of unity of design through architectural metaphor was popular around this period and this formulation will recur in my discussion of Whewell's *Plurality* below. See also, for instance, *Attributes*, II, p. 127.

arisen before in my argument, whether in Darwin's expression of the fatal doctrine as 'beauty or 'mere variety,' Macculloch's prizing of the variety of the divine aesthetic, or in Owen's discussion of the varieties of the *Bauplan* as forms without utility, and Miller likewise turned to an aesthetics of variety to explain why higher taxonomic divisions were diversified into innumerable specific forms. My aim here is to draw out how the central issue (and solution) of classification for Miller was that as there was no overarching functional reason for the multiplication of closely related natural kinds, it was only on the terrain of 'style' and its autonomous logic that the unity of creation could be realised *in* variety.³³⁴ Even within a biological context it was a categorisation of 'styles of ornament' that provided the key to the proper classification of natural kinds.³³⁵ Typology became an aesthetic dysteleology – species were aesthetic.

Miller commenced by noting the 'very admirable [...] consistency of style' that characterised the forms of fish fossils.³³⁶ In the classification of various different 'ichthyolites' these 'styles of ornament' were notable for both their 'consistency,' as no given individual fish mixes 'two styles' in a heterogenous manner, but also their diversity, as 'in scarce any two fishes do we find exactly the same style.'³³⁷ Descriptions of the variation between species did not resolve into the question of singular aesthetic individuations (with every instantiation of unity of plan unrelated to all others) but allowed for classification in terms of stylistic modes. There was a discernible and traceable logic of ways in which the same unity of design could be realised through modes of ornament, and as such, a stylistics properly speaking. For Miller, the key to style was reached in understanding the equilibrium between these two tendencies ('consistency' and 'diversity'), and the cognitive resources of architectural metaphor enabled Miller to make sense of this synthesis of unity and diversity that characterised divine 'style':

I pass fine buildings almost every day. In some there is a discordant jumbling—an Egyptian Sphinx, for instance, placed over a Doric portico; in all there prevails a vast amount of timid imitation. The one repeats the other, either in general outline or in the subordinate parts. But the case is otherwise among the ichthyolites of the Old Red Sandstone; nor does it lessen the wonder, that their nicer ornaments

³³⁴ *Sandstone*, p. 119.

³³⁵ *Ibid.*, p. 119.

³³⁶ *Ibid.*, p. 119.

³³⁷ *Ibid.*, p. 119.

should yield their beauty only to the microscope. There is unity of character in every scale, plate, and fin—unity such as all men of taste have learned to admire in those three Grecian orders from which the ingenuity of Rome was content to borrow, when it professed to invent—in the masculine Doric, the chaste and graceful Ionic, the exquisitely elegant Corinthian; and yet the unassisted eye fails to discover the finer evidences of this unity: it would seem as if the adorable Architect had wrought it out in secret with reference to the Divine idea alone.³³⁸

It was, then, on the model of the internal relation of the canonical classical orders that Miller saw the divine aesthetic of the architecture of creation, a divine aesthesis thought over against the failings of ‘discordant jumbling’ or ‘timid imitation’ that were the poor mimetic double of this exemplary success. Although human aesthesis was only the reflection of a divine logic of beauty, Miller’s detour through the ‘Grecian orders’ provided a way for unity of style to give meaning to unity of design as it was expressed in diversity. Unity in variety was the rationality of creation, and there was no reason for differences between natural kinds or species that can be derived on any other terrain than that of an aesthetic typology. Yet the logic of this unity, despite offering harmonious form to our pleasure, must ultimately remain ‘secret.’

In keeping with this vision of creation as a divine aesthetic artefact, wherever we look, and whichever frame of reference we take, the beautiful forms of nature are apparently multiplied; where, for example, the sensory prosthesis of the ‘microscope’ enables us to achieve access to ‘ornaments’ otherwise beyond experience. The supplement of scientific instrumentation functions analogously to cultural paideia (somewhere between Boyle’s ‘true Philosopher’ and Kames’s man of culture), augmenting our vision in the same way that ‘men of taste have learned to admire’ that which the ‘unassisted eye fails to discover’ in the logic of the classical orders. Yet, in this approach Miller ran up against the fundamental problem of claiming a beauty in design that normally lacks any audience to appreciate it, reiterating and apparently actively assuming the paradox materialised by the ichthyolites that ‘the microscopic beauty of these ancient fish was consigned to the twilight depths of a primeval ocean.’³³⁹ Given that the ultimate logic informing creation was the self-reference of the ‘Divine idea,’ our aesthetic intuition of design can only ever represent a partial or fragmentary

³³⁸ Ibid., pp. 119-120.

³³⁹ Ibid., p. 120.

access to its logic as manifested in the ‘beauty’ of form. In a transformation of the relational structure implied by natural theological beauty, the stylistics of natural form was framed as God’s aesthetic self-relation through the exteriorisation of the ‘Divine idea.’ CROE was primarily thought by Miller in terms of divine reflexivity, with the concerns of human perceptive subjects only parasitic upon this initial relationship, forever trying to glimpse the fragmentary aspects of its ‘secret.’ Although much of the beauty of creation was invisible in the present or lost to the past, natural forms were still aesthetically purposive. Beauty was a central portion of the inner logic of design: purposive for its creator, and only secondarily purposive for us, depending upon our perceptual and intellectual capacities.

However, despite having no primary reference to us as aesthetic adaptation, even this *nonrelation* to human sense could be recuperated as epistemically meaningful. The search after beauty was the search after the governing rationality of design, and the overarching rationality of creation, in all its apparently arbitrary facticity, was that ‘art comes to be pursued for its own sake,’ and, as such, that ‘the exquisite conception in the mind, or the elegant and elaborate model, becomes all in all to the worker.’³⁴⁰ For Miller, God was the being who took pleasure beauty and ornament, with the fragments of a primordial unity, ‘hewn in pieces,’ and its ‘limbs scattered over distant regions,’ realised as so many varieties scattered through time.³⁴¹ Thus, unity, only known to us temporally, was disseminated into diversity or variety, but was always-already there, synchronically, for God, as part of an eternal whole. Unity and apparently pointless typological variation were harmonised within the same model. Our access to the fragments of what we might dub “fossil beauty” provided by the expanding horizon of palaeontological knowledge lead directly to the conclusion that divine design had prosecuted art ‘for its own sake,’ and therefore gave us partial access to the aesthetic rationality of the whole of creation. This was an ‘arrangement that which we can alone refer to the will of the all-potent Creator, who can transpose his materials at pleasure, without interfering with the perfection of his work.’³⁴² Darwin, when he read *Sandstone* in 1842, seemed particularly unimpressed by this aspect of Miller’s thought, simply

³⁴⁰ Ibid., p. 120.

³⁴¹ Ibid., p. 69.

³⁴² Ibid., p. 89.

writing in his commentary “‘An inexhaustible variety of design expatiated freely within the limits of the ancient type,” – Bosh!!’³⁴³

Sandstone shows how the resources used by natural theologians to theorise beauty shifted during this period, now linked to morphological unity as inflected by a stylistic model of divine self-expression, and, accordingly, directly assuming an aesthetic teleology of design. Miller’s later work in this decade, his *Foot-prints* (1849), makes this transposition yet more explicit, as the framing of unity of design in terms of style – the ‘elegant and elaborate model’ – put forward in *Sandstone* was now thought directly in terms of Owenian transcendental anatomy. Although the relational framework underpinning CROE kept progress with the life sciences, it also deployed older cultural elements, with Miller taking a key concept of late eighteenth-century aesthetics – Joshua Reynolds’ notion of a beau ideal or ‘central ideas’ – and making it speak directly with Owen’s morphology, only recently given clearest voice in the *Nature of Limbs*.³⁴⁴ Again, Miller’s initial consideration was the relationship between idealism and classification, gesturing towards a model in which natural kinds manifested in the world were all organised ‘round some central idea,’ from species to genera, and genera to order, and so on, with every order of structure in nature nesting into some further ideal generality.³⁴⁵ At the highest level of generality, classification discovers an ‘interior central idea which constitutes a kingdom.’³⁴⁶ Yet, what was initially framed as a discussion of Owenian idealism as it related to classification pivoted into a discussion of such forms *as beauty*, with Miller constructing a direct analogy between Owen’s theory and how ‘Sir Joshua Reynolds forms his theory of beauty on this principle of central ideas.’³⁴⁷ As Miller cited Reynolds’s 1759 *Idler* essay, ‘every species of the animal, as well as of the vegetable creation [...] may be said to have a fixed or determinate form, towards which nature is continually inclining, like various lines terminating in a centre.’³⁴⁸ Beauty is in the natural kind, or the ideal of the natural kind as it exists in the mind of God, and so not only is there (as far as Miller’s claim can be parsed) a unique beauty for every species concept, but the higher formal generalities that describe

³⁴³ CUL-DAR205.9.157.

³⁴⁴ *Foot-prints*, pp. 38-69.

³⁴⁵ *Ibid.*, p. 39.

³⁴⁶ *Ibid.*, p. 39.

³⁴⁷ *Ibid.*, p. 39.

³⁴⁸ *Ibid.*; see Joshua Reynolds, ‘The Idler’ no. 83 in *The Universal Chronicle, or, Weekly Gazette*, 2 (3rdth Nov. 1759), 353-354.

the generic characteristics of living beings themselves represent a beauty or types of beauty on that basis.

Where Miller thought these higher taxonomic distinctions in terms of a typology of aesthetic design, it made a different kind of Anglophone Cuvier possible, with Miller reading the temporally successive creation of Cuvierian *embranchements* through geological history as a parable written into the material world itself.³⁴⁹ Those aspects of Cuvier's thought amenable to anatomical idealism could not only be appropriated in terms of transcendental morphology, but explicitly Christianised in terms of a typological biblical 'figure' used to 'symbolize the great monarchies of creation [taxonomic Kingdoms],' produced successively, and 'moving onward to a definite goal [humanity] in the unity of one grand harmonious design.'³⁵⁰ A distinctive and enduring Christian-Platonic strain in the work of several British aesthetic theorists (from Shaftesbury's *Characteristicks* to Reynolds's essays and *Discourses*), re-emerged in the service of design arguments to think beauty as the natural kind and marry typology with biological idealism. The foremost example of the relationship between idealised species essence and beauty offered by Miller was the human form, the notorious racialised 'Grecian beau ideal of the human nose, as seen in the statues of the Greek deities.'³⁵¹ For Miller, the Grecian nose was exemplary of how the 'central idea' of human form was materially instantiated in specific humans; a 'medial line of beauty' of which 'deformity' was a property of either 'rising above or sinking below' this imagined ideal standard.³⁵² Miller then ran this threadbare logic of an ideal physiognomy directly into the 'idea embodied in Professor Owen's archetypal skeleton,' with the aesthetic beau ideal that captures the essence of a natural kind equivalent to how we 'conceive [...] a central or primary type of all vertebral skeletons.'³⁵³

Miller's earlier appeal to the classical orders as a model for unity of design was resurrected in the link between a Platonising neo-classicism and transcendental anatomy, with aesthetic typology presenting a new way to understand the tension between unity of design and diversity in the world. The beauty of forms traces the *Bauplan* of design, representing, in Owen's terms, the marker that we have intuitively grasped its '*Bedeutung*' as

³⁴⁹ *Foot-Prints*, pp. 279-284.

³⁵⁰ *Ibid.*, pp. 282-3.

³⁵¹ *Ibid.*, pp. 39-40.

³⁵² *Ibid.*, pp. 39-40.

³⁵³ *Ibid.*, p. 40.

it is realised in materiality: the beau ideal – the central intellectual form of a natural kind – is both its truth *and* its beauty, with elements of Reynold’s aesthetics recruited to update the design argument. A homegrown idealism represented a way of grasping unity of design both aesthetically and epistemically in a model of organic form as harmonious totality purposive for knowledge and beauty. So, in Miller’s work, CROE pivoted such that beauty was no longer straightforwardly conceptualised as an extension of correspondency – of the object created directly for our aesthetic sense – but in terms of emanation; as a way in which we can partake mediately of God’s self-relation through the exteriorisation of the divine idea in the material world. As I will discuss in the following chapter regarding Kingsley and Huxley, this aesthetic inflection of idealism would take on an increasing importance for many authors moving through the 1850s.

There remained, however, an uneasiness to this constellation, especially as morphology flirted with transmutation. Miller was cautious regarding the relationship of Owen’s ‘lately published treatise,’ the *Nature of Limbs*, with the work of figures such as ‘Professor Oken,’ particularly his vertebral theory of the skull, and, as its (claimed) corollary, the ‘development hypothesis.’³⁵⁴ As discussed in the previous section, Owen had himself discussed archetypic theory in terms amenable to transmutation, and although Miller did not read Owen in this way, he remained acutely sensitive to the possible shift from the structuralism of anatomical idealism to a diachronic theory – ‘the central idea, thus converted into a sort of historic myth.’³⁵⁵ Characteristically, Miller’s appeal was to the fossil record, that ‘while we find place in that geological history in which every character is an organism, for the “ideal exemplar” of Professor Owen, we find no place in it for the vertebrae-developed skull of Professor Oken.’³⁵⁶ The history of life was the serial instantiation of variations upon the ‘ideal exemplar,’ with every variation of form its own species and respective beau ideal, but in this account, beauty – and the association of the beauty of a being in its species essence with an ideal form – must be tied to a static theory of unchangeable essences. The *telos* of creation unfolded as the typological continuum of providence, but the plan of design was itself timeless. So, despite Owen’s own view regarding the temporal development of an otherwise purposeless archetype of design, for Miller CROE was synchronic, and the

³⁵⁴ Ibid., pp. 39-40.

³⁵⁵ Ibid., p. 41.

³⁵⁶ Ibid., p. 69.

relationships between beautiful forms and recipients (divine or human) could not be mobile. Our appreciation of beauty remained parasitic upon the eternal and atemporal self-relation of God in aesthetic form. Although adaptive utility was largely gone as a category in Miller's writing, the relational structure of beauty remained. God took pleasure in the inner logic of design as a unified compositional or artistic plan as such. We, in turn, might hope to glimpse the fragments of the absolute in all its beauty.

Between Teleology and Functionless Form – Whewell's Theory of Beauty in the *Plurality of Worlds*

During the analysis of Miller's work, my account of CROE reached a possible stumbling block: namely, whether the attenuation of functional adaptation as the teleological framework by which design was cognised entailed the dissolution of any adaptive understanding of beauty. Although, from the time of Paley through to the 1830s, beauty or ornament had generally been thought as a teleological supplement to utilitarian contrivance, the relational framework inhering between aesthetic properties and our appreciation of them still partook of the fundamental structure of adaptation or correspondency. Thus, where beauty was reconceptualised as emanation or divine self-relation through creation, it might seem that a simplistic narrative of the ascent of morphology against adaptive teleology was borne out in natural theological aesthetics. Against the backdrop of the apparent abandonment of teleological explanation and the Paleyan tradition, I now explore some of William Whewell's later work, principally his *Plurality of Worlds* (1853), providing an account of how a central figure within both natural theological and scientific writing made the transition towards morphology, and, as a vital component of this shift, provided a theory of beauty. I will read Whewell's work as representing a bridge between what have been framed as competing conceptions of divine teleology, with Whewell's resolution of this apparent impossibility taking place *through* a theory of beauty as the meeting point or principal of concord between functional and morphological understandings of organic structure. I uncover how – for Whewell at least – the morphological turn did not imply the abandonment of adaptative teleology, but instead necessitated a shift towards the aesthetic *qua* purposeless purpose as a way of conceptualising the ultimate logic of all adaptive teleology. Indeed, beauty thereby

provided a means for Whewell to harness the resources of anatomical idealism for a largely orthodox argument from design. Transcendental morphology could be cashed out aesthetically to make it cohere with the habitual philosophical concerns of anglophone natural theology, without, like Miller, wholly embracing idealistic explanations.

Although Whewell's broad cultural interests have often been commented upon, it is remarkable how little detailed attention has been offered regarding Whewell's direct theoretical interventions within aesthetics, especially beyond his early work of architectural history, the *Architectural Notes on German Churches* (1830).³⁵⁷ I take as symptomatic in this regard the collection *William Whewell: A Composite Portrait* – the broadest ranging extant survey of Whewell's life, career, and corpus – which, despite a general acknowledgement that the 'omniscientist' Whewell was searching out an 'underlying unity' that comprehended 'aesthetics' as much as any other 'realm of knowledge,' provides scant detail of either Whewell's understanding of central aesthetic categories, or, indeed, how they intersect with his work more generally.³⁵⁸ For instance, although Harvey Becher has written regarding Whewell's early foray into architectural theory and history, that his was a 'structural-analytical approach reinforced by geometrical descriptions,' little work is done to understand how this 'structural-analytical approach' concretely intersects with Whewell's own later philosophy.³⁵⁹ Simon Shaffer has also noted that there appeared to be some link between Whewell's philosophy of science and the 'problems of aesthetic judgement' as it related to his architectural interests, but the details of Whewell's engagement remain in abeyance, with Schaffer suggesting that a productive avenue for future research might be found in Whewell's relationship with 'Romantic poetics.'³⁶⁰ I will return to the issue of Romanticism immediately below, but my principle goal will be to reveal how Whewell's aesthetic interests were reflected in his more narrowly scientific or philosophical work, and nowhere more so than in his attempt to resolve the teleological paradoxes of a science of living form.

Intersecting with this consideration, Whewell's yoking of beauty to morphology during the 1840s-50s opens a new vista onto one of the classic tropes of western aesthetics, in the

³⁵⁷ William Whewell, *Architectural Notes on German Churches with Remarks on the Origin of Gothic Architecture* (Cambridge: Deighton, 1830).

³⁵⁸ *Whewell*, ed. by Fisch and Schaffer, pp. vii-viii.

³⁵⁹ See, Harvey Becher 'William Whewell's Odyssey: From Mathematics to Moral Philosophy' in *Whewell*, ed. by Fisch and Schaffer, pp. 1-31 (pp. 7-8).

³⁶⁰ Simon Schaffer, 'The History and Geography of the Intellectual World: Whewell's Politics of Language' in *Whewell*, ed. by Fisch and Schaffer, pp. 201-31 (pp. 215 and 231).

words of Ewan Jones, ‘the hoary concept of organic form, as standard critical histories continue to hand it down to us,’ and generally associated with Romantic thought (for present purposes especially Coleridge, and the scientific legacy of the Coleridge circle).³⁶¹ Famously, Coleridge had himself discussed the logics of life and beauty in terms of near identification, even providing a symmetrical phraseology; beauty, in Coleridge’s ‘Principles of Genial Criticism’ as ‘*multēity in unity*’; and, in his *Theory of Life*, life itself as the ‘power which discloses itself from within’ as a ‘principle of unity in *multeity*.’³⁶² Clearly, Coleridge’s characterisation of beauty was a reformulation of one of the ultimate commonplaces in the history of western aesthetics, and Coleridge was himself quite happy to locate the history of his own concept within classical philosophy and Catholic theology.³⁶³ Indeed, more proximately to natural theology aesthetics, we have already seen this formulation in Hutcheson’s *Inquiry*, with the dynamics of unity and diversity in beautiful form representing one of the central historical planks of modern aesthetics.

Accordingly, the question of an analogy between (or even identification of) aesthetic and organic form will move to the fore in this section, most pressingly regarding the question of part-whole rationality and the relationship between functional and aesthetic unity. In line with the waning of functional teleology (the replacement, say, of Cuvierian typology with Owenian archetype), this had become a growing problem through the 1830s and 40s, and, with functional integration largely eclipsed as the leading criteria of organismal coherence, unity was rethought by Whewell in terms of the mutual identification of the teleological form of work of art and organism. Despite, perhaps even because of, Whewell’s uneven intellectual relationship with Coleridge (although their public differences were productive enough to concern the origins of the term ‘scientist’ itself), Whewell’s development of the link between organic and aesthetic form offers a way of showing a much broader relevancy to this philosopheme beyond the legacy of a putative Romantic ideology.³⁶⁴ Following upon the prompt of Jones’ characterisation, that the idea of organic form has often been ‘employed as a placeholder for a more-or-less naïve faith in poetical “wholeness” [...] without any sense of

³⁶¹ Ewan Jones, *Coleridge and the Philosophy of Poetic Form* (Cambridge: Cambridge University Press, 2014), p. 58.

³⁶² Samuel Taylor Coleridge, *Shorter Works and Fragments*, ed. by Jackson and de Jackson, 2 vols (Princeton: Princeton University Press, 1995), I, pp. 369 and 510.

³⁶³ See *ibid.*, I, pp. 368-70.

³⁶⁴ See, for instance, Richard Yeo’s brief discussion of the BAAS meeting in 1833 that first occasioned Whewell’s coinage; Richard Yeo, *Defining Science* (Cambridge: Cambridge University Press, 1993), pp. 110-111.

its manifold complexity,' my aim will be to think through this entanglement on a teleological register, exploring how Whewell reinscribed this venerable trope whilst also transforming its basis by placing transcendental morphology in the service of a natural theological theory of beauty.³⁶⁵

To begin, and before turning to Whewell's more coherent account of beauty in the *Plurality of Worlds*, I chart how Whewell's work negotiated a transition from Cuvierian-Paleyan functionalism to a more idealist or morphologically influenced approach through the 1830s and 40s, without – importantly – abandoning the central assumptions of the design argument as inherited from the Anglophone tradition. The key to understanding this continuity in Whewell's thought is his characterisation of unity in terms of part-whole relationships, compositional totality or organisation, and thus, fittingly, in terms of a metaphorical architecture of form. In this way, although a discussion of Whewell's work on architecture might otherwise (at least initially) appear as a detour, Whewell's development of a theory of Gothic form in church buildings reveals a structure of thought that would recur again and again in his future corpus, not simply within the purview of aesthetics narrowly defined, but in his turn towards biological idealism (much in the same way as Miller). Where architecture provided a metaphorical vehicle for thinking about a kind of more general structuralism, it represented a transferable component for cognising otherwise widely divergent kinds of form.

In the preface to the first edition of the *Architectural Notes*, Whewell offered a definition of style in terms of the discussion of 'idea, or internal principle of unity and harmony' which encompassed the 'characteristic forms' of Gothic style.³⁶⁶ Considered in its highest degree of abstraction, Whewell's overarching formal thesis regarding the Gothic was the move from a 'horizontal' (Classical and Romanesque) organisation of spatial form, to a 'vertical' organisation of spatial form, with all particular formal instantiations following upon this 'universal tendency.'³⁶⁷ Against the historical denigration of Gothic style in comparison to classical architecture, for Whewell the 'merit and beauty of the new style' was beyond reproach, because, as Whewell's logic ran, it was founded on 'principles as fixed and true, as

³⁶⁵ Jones, p. 104.

³⁶⁶ *Architectural Notes*, p. iv.

³⁶⁷ *Ibid.*, pp. 2-3.

full of unity and harmony, as those of the previous system.’³⁶⁸ As much as a definition, this characterisation of Gothic form in terms of ‘unity’ represented an evaluative criterion, both for praising Gothic style in terms of its own immanent stylistic logic, but also for criticising forms that fell short of such a model. For instance, in Whewell’s criticism of Milan Cathedral, which has ‘no claim to be considered as a good example of Gothic architecture,’ Whewell’s key reasoning was that ‘in order to possess excellence in this, as in any other style, a work must have the requisite parts clearly exhibited and well-proportioned.’³⁶⁹ The interest of Whewell’s formulation is not the specifics of how ‘requisite parts’ correspond to the rule or ‘idea’ of Gothic style, but the broader structure of Whewell’s argument, which developed the rigid classificatory paradigm of an essence (‘idea’) which governs what plastic form strives to achieve within a stylistic period. Tautologously, only when the parts of a structure correspond with the fullest idea of a Gothic mode of organisation, will they possess the unity or harmony of form that marks them as successful (or, indeed, beautiful). Yet, despite this internal rigidity of individual styles, Whewell was clear that there was no hierarchy *between* architectural styles. So, although Milan Cathedral can appropriately attract the critical appellation ‘barbarous,’ because the ‘ideas which govern its forms’ (the ‘Gothic spirit’) are ‘incongruously combined and imperfectly developed,’ Gothic architecture was itself neither more nor less beautiful or barbarous than any other ‘style of art.’³⁷⁰

Whewell’s theory was therefore both strict, in that it identified all specific architectural successes as the individuated achievements of an ideal classificatory form, but also pluralistic, in that there were multiple possible ideas of harmony or unity that could be achieved. Within the domain of architecture, then, a model was developed that bore more than a passing resemblance to Whewell’s later thought, both in the epistemic form of Fundamental Ideas (despite the rigid universality of any given Idea, a plurality of Ideas unfold to organise sensory data), but also insofar as Whewell’s approach to aesthetics was structured by the posit of ideal unity years before either the mature formulation of Whewell’s inductive philosophy, or the morphological turn in his biological thought through the 1840s and 50s. Respecting the constellation of Whewell’s concept of aesthetic unity with the trope of organic form, in the new preface of the second edition text of the *Architectural Notes*

³⁶⁸ Ibid., p. 4.

³⁶⁹ Ibid., p. xix.

³⁷⁰ Ibid., p. xx - xxii.

(1835) Whewell offered an analogous defence of the ideal unity materialised by Gothic architecture as he had in the first, but now this unity was translated in terms of ‘principles’ that represent a ‘connected and organic whole,’ even if the precise meaning of this formulation (and, indeed, the formal principles it claims to instantiate) remain opaque.³⁷¹ Although, rather unhelpfully, the *Architectural Notes* provides the incorrect bibliographic information, Whewell derived this formulation from an article by Francis Palgrave that appeared in the *Quarterly Review* in July 1822.³⁷² As Whewell quoted Palgrave, Gothic architecture represents an ‘organic whole,’ a trope that Whewell parsed in terms of ‘unity and connexion in the members of this form of art,’ and so a part-whole rationality analogous to the ‘symmetry and simplicity’ of classicism, but expressed through a unique spatial unity that could comprehend, control, and render beautiful the apparent disorder materialised in the Gothic clamour of forms.³⁷³ However, beyond the presiding identification of the Gothic idea with vertical spatial organisation, Whewell could offer no definite account of what this idea actually was. Yet, the absence at the heart of Whewell’s approach was somehow central to its logic, as Whewell would claim that irrespective of any finalisable ‘definition’ of Gothic style, it was still possible to gain an intuition (‘inward possession’) of latent unity in Gothic form.³⁷⁴ We can classify and enjoy aesthetic form despite our inability to define even its basic elements in ‘distinct abstract terms.’³⁷⁵

The following years would see the publication of Whewell’s *History* and *Philosophy* (1837-40), and I have already explored how Whewell founded any science of organic form on the Fundamental Idea of final causation, with this same teleology subsequently grounding the security of our perception *tout court* through correspondency. However, as yet, I have made little of how Whewell cashed out teleology in terms of composition, organisation or part-whole finality, with the importance of part-whole reasoning for Whewell’s thought manifested most clearly in his discussion of the ‘Doctrine of Final Causes of in Physiology’ in the *History*.³⁷⁶ For Whewell, the foundation of a science of organic form (physiology) is that ‘all [...] parts are mutually ends and means,’ or, alternately, that ‘organs [...] constructed and

³⁷¹ William Whewell, *Architectural Notes on German Churches*, 2nd edn. (Cambridge: Deighton, 1835) p. xii.

³⁷² [Francis Palgrave], ‘Plans, Elevations, and Sections of Henry the Seventh’s Chapel,’ *The Quarterly Review*, 27 (1822), pp. 308-336.

³⁷³ Whewell, *Architectural Notes* 2nd edn, p. xi.

³⁷⁴ *Ibid.*, p. xii.

³⁷⁵ *Ibid.*, p. xii.

³⁷⁶ *History*, III, pp. 456-478.

combined in subservience to the life and functions of the whole,' a way of thinking which Whewell takes as the 'master principle' or 'very essence of organisation.'³⁷⁷ Regarding Cuvier's *Règne Animal*, Whewell quoted the principle of 'conditions of existence' (as it intersects with correlation) as the teleological precept that 'the different parts of each being must be co-ordinated in such a manner as to render the total being possible, not only in itself, but in its relations to those which surround it.'³⁷⁸ In short, organisms must be thought in terms of a totalising part-whole rationality, or logic of "compositionality," with living wholes the unity in diversity of structural elements thought through the form of teleological finality.

What wasn't clear, however, was what kind of 'relations' were subsumed by this adaptational concept. As an adaptive account of an environment to the utility of a living being, 'conditions of existence' certainly comprehended functional considerations like dwelling, feeding and reproducing, but did this concept also include the adaptation of that being to other beings, including in the modality of functionless properties, like beauty and its enjoyment, say? We have already seen how Whewell's *Bridgewater* pushed adaptational concepts towards universality, and so, to maintain the unity of an organism as functionally adapted totality (thus preserving the Idea of design), it was necessary to somehow comprehend these other aspects of design within the form of thought of adaptive unity. Whewell's challenge, then, would be to make the functional unity of organic form (correspondency) match the aesthetic unity of organic form he discovered in the Gothic cathedral. This was not just the Romantic problem of organic unity, but a product of the much longer history I have traced, from Boyle to Paley and beyond, of the tension between various models for cognising natural finality for the design argument. Where post-Paleyan theory already contained within itself the aporia of purposeless purpose, and the functionalism of Cuvierian theory was made to speak to divergent teleologies of design, transcendental anatomy, as a way of thinking the organism as purposeless but lawful unity, might offer a way forward. This, as I shall explore, was the path followed by Whewell.

Any turn towards morphological idealism in Whewell's later work was long foreshadowed during the 1830s, with discussions of 'unity of composition,' 'common type,' *Naturphilosophie* and the conflict between Geoffroy and Cuvier in the *History*, and a chapter

³⁷⁷ Ibid., III, pp. 470, 469-471 and 456.

³⁷⁸ Ibid., III, p. 473; *Règne Animal*, I, p. 6.

dedicated to the 'Idea of Natural Affinity' in the *Philosophy*.³⁷⁹ Although 'natural affinity' was dignified with *a priori* status, Whewell had tended to subordinate these questions to the regulatory role of final causation as the preeminent principle of life and organisation. For Whewell, affinity did not have absolute specificity to life as a *sui generis* phenomenon. However, as both morphology and its possible transmutational corollary became an issue through the 1840s, when *History* and *Philosophy* were extracted in a more popular format as an explicit work of natural theology in his *Indications of the Creator* (1845), Whewell went to much greater lengths to resolve this link.³⁸⁰ Whewell's claim was similar to Owen's, that despite a superficial conflict, there was no irreconcilable difference between morphology and teleology; that 'the modern doctrine of Unity of Plan in different kinds of animals does not at all necessarily contradict the Doctrine of Final Causes: [...] *Morphology* is not necessarily inconsistent with *Teleology*.'³⁸¹ Where morphological explanations of organic form were grounded in affinity or unity of plan, although the 'principle of design changes its mode of application,' for Whewell 'it loses none of its force.'³⁸² For Whewell, morphological law did not undermine the principle of correspondency, instead revealing an interrelated network of adjustments as tending to ever-greater universality. As Whewell put it, 'we are [...] by the discovery of the general laws of nature, led into a scene of wider design, of deeper contrivance, of more comprehensive adjustments. Final causes, if they appear driven further from us by such an extension of our views, embrace us only with a vaster and more majestic circuit.'³⁸³ If the individual organism was no longer wholly circumscribed by the intuition of organic unity as functional integration, the unity of plan its form evidenced suggested the same idea of functional totality for all life and the cosmos at large as a single integrated totality.

Whewell's general philosophical project had, in this sense, the same epistemic form as Owen's theoretical programme within the domain of biology. Indeed, in the *Plurality* Whewell quoted Owen's *Nature of Limbs* in support of a kind of biologised Platonism

³⁷⁹ See *History*, III, pp. 444-455 and *Philosophy*, I, pp. 516- 523.

³⁸⁰ Whewell, *Indications of the Creator* (London: John Parker, 1845). For Whewell's *Indications* as a response to *Vestiges*, see *Victorian Sensation*, pp. 227-229.

³⁸¹ *Indications*, p. ix-x. Invariably, Whewell moved against morphology as a theory of transmutation (i.e. pp. xiv – pp. xix).

³⁸² *Ibid.*, pp. 94-95.

³⁸³ *Ibid.*, p. 95.

regarding the truths delivered to us by the inductive sciences.³⁸⁴ For Whewell it was a work ‘full of the most energetic and striking passages, inculcating the doctrine which we have been endeavouring to maintain,’ a doctrine that was, in short, that ‘the Laws of Nature are the indications of the operation of the Divine Mind; and are revealed to us, as such, by the operations of our minds, by which we come to discover them.’³⁸⁵ In this idealistic and speculative turn, anatomical knowledge represented knowledge of the plan, and as knowledge of this intentional structure, was still bound to finality as its overall teleological condition, despite abandoning a strict functionalism at the level of individual living beings. Insofar as they were discoverable through inductive philosophy, for Whewell laws of nature became the ‘utterances of the Creator, delivered in language which we can understand,’ an understanding of law as *logos* that linked to the claim that ‘truth [...] must be alike *Truth* for all minds, even the highest.’³⁸⁶ Teleology was both localised to a particular science – the fundamental ideal governing biological form – but also generalised in the correspondency between all laws, including their purposiveness for us – a ‘language which we can understand.’ Properly understood, such a language gave us access to the Deity’s perspective, truth implying a direct isomorphism between the ‘operation’ of the human and ‘Divine Mind.’ Analogously to Owen’s ‘higher teleology,’ Whewell didn’t see adaptation and morphology as irreconcilable epistemologies, instead reading the localised *telos* of knowledge (as our ideas adaptively unfold in the world they discover empirically) as recapitulating the universal and synchronic teleology of the divine Plan as it existed in eternity without further purpose beyond itself.

What, then, of beauty in the *Plurality*? As the *Architectural Notes* attest, Whewell’s approach to aesthetic form was always marked by a kind of structuralism, and where Whewell shifted towards a structural understanding of organic form, an adaptive understanding of beauty as purposeless purpose confronted morphological unity as its own kind of purposeless form. Accordingly, I am principally interested in two formulations that Whewell gave of beauty in the *Plurality*; the first a brief negative conception where Whewell confronted the teleological aporia of beauty and function in design and cleared way for a positive theory; the second a longer and more coherent account of natural beauty, representing Whewell’s

³⁸⁴ *Plurality*, pp. 249-251.

³⁸⁵ *Ibid.*, pp. 249-251.

³⁸⁶ *Ibid.*, p. 251.

longest engagement with aesthetic theory as it related to design.³⁸⁷ In outline, Whewell's theory of beauty in the *Plurality* returned to a theme first broached in the *Architectural Notes*, with a mathematical or abstractive understanding of form framed in terms of a higher geometric unity, idea or law. However, Whewell then segued from a mathematical logic of form to purposelessness, with the dehiscence between the law governing form and the purpose of form seen to follow immanently from the operation of law itself. This consideration would force Whewell to confront the very notion of lawfulness *per se*, and what the ultimate teleological meaning of laws of nature implied, and so, startlingly, whether the identification of the teleological form of beauty with that of law ultimately indicated that nature was itself an aesthetic artefact, or created for aesthetic purposes.

The initial gesture by which Whewell cleared room for a theory of beauty was hypothecated on the failure of adaptive function – the 'beautiful contrivances' of Paley – at the level of the organism itself. As Whewell made clear, form remained beautiful, and contrivance remained beautiful, despite their disavowance with utility as total functional integration:

The beautiful contrivances which exist in the skeleton of man, and the contrivances, possessing the same kind of beauty, in the skeleton of a sparrow, do not appear to any reasonable person less beautiful, because the skeleton of a man, and of a sparrow, have an agreement, bone for bone, for which we see no reason, and which appears to us to answer no purpose.³⁸⁸

Whatever its negative framing – the ideal unity of the vertebrate body plan had no clear relationship to utility – the dehiscence between structure and function had no deleterious effect on our appreciation of 'beautiful contrivances' in their particularity. Thus, Whewell not only still deployed the habitual rhetoric of Anglophone natural theology, but, in a way that few others did, directly confronted the apparent teleological *cul de sac* beauty now implied. Whewell didn't, as Kingsley and Huxley soon would, propose a thoroughgoing idealism as a response to the breakdown of Paleyan teleology, but tried, somehow, to accommodate an adaptive pattern of thought. Transcendental anatomy could not harm our relationship to the beauty of the contrivance despite stripping functional unity of 'purpose,' and so, at least in

³⁸⁷ See *ibid.*, pp. 235-243.

³⁸⁸ *Ibid.*, p. 212.

this initial formulation, Whewell committed to the idea that our intuition of beauty as contrivance no longer depended on function. Despite the collapse of utility as the ultimate motivation of biological structure, Whewell staked out the *a contrario* condition for the continued identification of the beautiful contrivance in the Paleyan sense. However, Whewell also did more than this, and hinted at a positive means of unifying teleology and morphology, as the reception of beauty itself seemed to point towards a comparative exercise in which we traced the ‘same kind of beauty’ as an aesthetic unity of form. There were *aesthetic homologies of function*, and although homologies ‘answer no purpose,’ they were still experienced as beauty. Such aesthetic homologies gestured towards the possibility that aesthetic purposiveness could be made to substitute for function, recapitulating the epistemic argument Whewell had given to reconcile unity of composition and final causation by taking our *relationship* to otherwise purposeless organic forms as a kind of purposiveness.

Having cleared the ground for positive claims, Whewell now proposed a theory of beauty that took purposelessness as its innermost logic. Crucially, this purposelessness was identified with the abstract mathematical laws that described the morphological transformations of the transcendental archetype as it was materially realised.³⁸⁹ It was these transforms that produced aesthetic form, and, like Miller, for Whewell we had to understand beauty as indexing the process by which the same basic design was manifested as unity in variety. Beauty was both in the law itself, but also in the repetition with difference that produced a manifold of particular forms. To begin, Whewell moved from the inert to the living, tracing the same organisational mathesis which ‘shows itself throughout the mineral kingdom’ and ‘throughout the whole range of chemical composition,’ but which became ‘still more manifest in the vegetable domain.’³⁹⁰ The geometry by which the forms of plants differ – ‘the rose, the lily, the cowslip, the violet’ – , was the same by ‘which the crystalline forms of the several gems differ.’³⁹¹ Unity of plan, subject to only a few simple modifications, produced profusion, with a ‘vast array of flowers, so infinitely various, and so beautiful in their variety’ all similarly the ‘results of a few general laws,’ and, depending on their ‘degree of [...] symmetry,’ the ‘alternate operation of one law or another.’³⁹² The same morphological

³⁸⁹ See *Ibid.*, pp. 239-241.

³⁹⁰ *Ibid.*, p. 239.

³⁹¹ *Ibid.*, p. 239.

³⁹² *Ibid.*, p. 239.

transforms ‘produce all the multiplicity of beauty which the florist admires,’ turning an ideal unity of type into material complexity. In line with Whewell’s claim in his *Bridgewater* regarding the visibility of adaptive design in biological form, our aesthetic appreciation of flowers now played the same role for intuiting the abstract logic of unity of design. The form of flowers materialised the mediation between the generality of law (intellectual unity) and the profusion of material life as it was encountered in the world. Concomitantly, there was an epistemic interest at the heart of Whewell’s aesthetics, with the pursuit of beauty the spur to achieve a universal perspective; to see, academically, through ‘the eye of the philosophical botanist,’ that the ‘whole of the structure of plants, with all their array of stems and leaves, blossoms and fruits, is but the manifestation of one Law.’³⁹³

Yet, thought from such a properly ‘philosophical’ perspective, this abstract mathematical structure did not just describe a law of transformation that produced manifold forms, but was an ontological claim, with Whewell assuming the stronger position of unity of plan, that ‘all these members of the vegetable form, are, in their natures, the same, developed more or less in this way or in that.’³⁹⁴ Whewell was well-versed in the work of Goethe, even going so far as to suggest that Goethe’s aesthetic interests motivated his posit of the transformations of the *Urpflanze* as the underlying principle of vegetable morphology (we might ‘be led to think that this writer’s poetical endowments had contributed to this scientific discovery;- the love of beauty of form, by fixing attention upon the symmetry of plants; and the creative habit of thought, by making constant development a familiar process’).³⁹⁵ Given this influence, and Whewell’s own recognition of an interface between an aesthetic and morphological ‘habit of thought’, it is difficult not to see Goethe’s *Urpflanze* in Whewell’s formulation of botanical beauty in the *Plurality*. Seizing upon this older current of morphological speculation, Goethe’s transformism could be made to cohere with the specific Anglophone problems of the teleological status of beauty, with the archetype given new meaning by God as artist modifying otherwise meaningless form as an aesthetic end.

In this model, a mathematical transformation – both law and beauty – became the logic informing speciation into distinctive natural kinds, where, for example, the ‘daisy consists of a close cluster of flowers of which each has, in its form, the rudiments of the

³⁹³ Ibid., p. 239.

³⁹⁴ Ibid., p. 239.

³⁹⁵ *History*, III, p. 434. See also Johann Goethe, *Die Metamorphose der Pflanzen* (Gotha: Ettinger, 1790).

valerian,' or the 'peablossom' was revealed as the transformation of a 'rose, with some of its petals expanded into butterfly-like wings.'³⁹⁶ However, the question remained of how we were to think this morphogenesis temporally, especially as many, whether Owen or Goethe himself, had hinted towards an immanent temporal aspect regarding the production of *new* species by transformations of type. At one level, Whewell understood this transformation synchronically or structurally, with the geometry of form thought as an iterative transcendental sequence of additions or transformations of a single element, and therefore an expression of 'beauty' that was simultaneously known as absolute formal 'regularity':

By the addition of whorl to whorl, of vegetable coronet over coronet, green and coloured, broad and narrow, filmy and rigid, every plant is generated, and the glory of the field and of the garden, of the jungle and of the forest, is brought forth in all its magnificence. Here, then, we have an immeasurable wealth of beauty and regularity, brought to view by the operation of a single Law.³⁹⁷

Yet, equally, in the transitive operation of a 'single Law' operating on a single unity of form, typology was recovered for process, with laws of morphogenesis, as laws of development, operating diachronically in the world as the vehicle that has 'brought forth' or 'generated' the ideal in its material variety. But this begs the question of how far Whewell was willing to push this diachronic aspect of morphogenesis, as even within a given species 'this general law leads to endless changes,' and so, after a process of selective breeding 'the garden-rose' represents a 'common hedge-rose with innumerable filaments changed into glowing petals.'³⁹⁸ However, despite gesturing towards formal plasticity, for Whewell there was no immanent production of ontologically new kinds in the world, remaining strict in the belief that 'we cannot conceive a greater violation of the known laws of nature [...] that such an event as the appearance of a new species should have occurred.'³⁹⁹ Whewell relied, instead, on a kind of theological palingenesis, which thought two temporalities of design concurrently. Design unfolded at the level of individuals, but was also rigidly synchronic, as the archetypic plan, and the laws of its transformation, were themselves fixed and eternal. Morphogenesis was the working out of what was always-already there.

³⁹⁶ *Plurality*, p. 239.

³⁹⁷ *Ibid.*, pp. 239-240.

³⁹⁸ *Ibid.*, p. 239.

³⁹⁹ *Ibid.*, p. 71.

Whewell's position, then, implied a deep ontological unity that was the concomitant of unity of law: all plants were one kind of being transformed into a multiplicity of surface forms through the operation of only a few laws. In this entanglement of law and beauty, a mathematics of form directly pivoted into the beauty of design, with beauty being made nearly synonymous with the architectonic of natural laws. However, where organic form represents a nexus in which lawfulness and beauty were made synonymous, Whewell's theory started to take on a paradoxical form. The reason for laws of nature (the production of beauty, symmetry and order etc.) was a result of a divine will to institute and follow the immanent logic of law for the sake of itself, and so had the complexion of an *excess* of rationality that trends to irrationality. In unity of design, the architectonic of nature discovered through morphology was, as other structural principles, the discovery of the form of lawfulness without function, 'as if the Creator delighted in the generality of the law, independently of its special application.'⁴⁰⁰ Yet, this law was itself now made synonymous with an aesthetic finality, identified with the 'innumerable results of beauty and symmetry, as if the Creator delighted in beauty and symmetry, independently of the purpose answered.'⁴⁰¹ CROE returned in the *Plurality*, but similarly to Miller's work, our relationship with beautiful form was now parasitic on God's own self-enjoyment in creation as the primary end of such form. For instance, within the domain of astronomy, our 'sentiment connected with [the] regular and symmetrical form of the heavenly bodies,' was the enjoyment of such bodies as 'being thus beautifully formed and finished.'⁴⁰² The 'sentiment' that constitutes beauty follows from law, or, rather, is the pleasure of our sensory harmonisation with an intuition of the form of lawfulness as we discover it in the world. God enjoys law for itself, which is beauty, and our enjoyment retraces this principle of design as we discover its laws. For Whewell, the link between the teleological form of beauty and law was paramount, and although we might spontaneously think that 'law and order,' 'symmetry' and 'beauty are the marks of some noble purpose,' that is, 'framed with a view to some use,' it was central to Whewell's account that we cannot identify beauty with transcendental utility.⁴⁰³ Instead, the mutual cooccurrence or identification of beauty and law was founded in the fact that law

⁴⁰⁰ Ibid., p. 237.

⁴⁰¹ Ibid., p. 237.

⁴⁰² Ibid., p. 236.

⁴⁰³ Ibid., pp. 236-7.

contains an excess of rationality, followed for the sake of 'delight' in law itself and so in its autonomy trending to purposeless purpose. Lawfulness contained a tension revealed by the very beauty it produced, as efficient causes were revealed as transcendently aesthetically purposive, and law, as instituted by God, was shown as a *telos* without any finality beyond itself.

Despite Whewell initially offering this vision of aesthetic design in terms of the 'as if,' which bore more than a passing resemblance to the Kantian *als ob*, in actuality Whewell's logic differed significantly, with the teleology of organic and aesthetic form made wholly synonymous in the *Plurality*. Although Kant was clear in the third critique that teleological reflective judgements regarding beauty and living purposiveness were analogous, he was equally clear that there was a fundamental dissymmetry between these teleological modes. For instance, in §65 of the *Kritik der Urteilskraft*, where, although 'beauty in nature may rightly be called an analogue of art,' we make this claim 'only in relation to our *external* intuition of them,' and not in relation to the 'intrinsic natural perfection' that determines them as 'natural purposes' or 'organised beings.'⁴⁰⁴ Thus, although we can make natural forms aesthetically purposive *for us* by making a judgement of beauty regarding them, this is not their intrinsic purposiveness *qua* organised being, and such aesthetic judgements cannot be mistaken for a claim regarding the purposive without purpose as the intrinsic teleological determination of their form. However, contravening Kant's interdiction, Whewell's claim, as I will now explore it, was that the aesthetic *was* an intrinsic teleological determination of organic form, not simply form considered 'as if the Creator delighted in beauty and symmetry,' and therefore only aesthetically purposive for us extrinsically. Nature, like the Gothic cathedral, was an intrinsic aesthetic unity in variety.

Whewell's ontologically charged resolution of the question of aesthetic teleology was announced rhetorically by a shift towards repeated rounds of unanswerable questions: 'to what use? What purpose do these beauties answer? What is the object for which the lilies of the field are clothed so gaily and gorgeously?'⁴⁰⁵ Although some beautiful beings might take on a utilitarian end outside of themselves – 'subservient to the use of animals and of man' as the 'intelligible purpose of their existence' – for Whewell, the number of instances remained

⁴⁰⁴ Emmanuel Kant, *Critique of Judgement*, trans. by Werner Pluhar (Indianapolis: Hackett, 1987), p. 254.

⁴⁰⁵ *Plurality*, p. 240.

far too 'small' to offer a meaningful overarching account of the logic of design.⁴⁰⁶ So, with the common gesture that characterised natural theological theories of beauty, Whewell fell back into an arbitrary justification for the rationality of design, accepting that the beautiful and multifarious forms of plants simply 'grow because the Creator willed that they should grow.'⁴⁰⁷ Where Whewell maintained the relevancy of final causes, with beauty caused by both law *and* direct aesthetic adaptation, the concept of a law of nature itself fell towards the idea of divine fiat, with the Janus face of the lawful production of beauty being the voluntarism of the Creator. As Whewell wrote in stark terms, beings in nature 'are beautiful [...] because He willed that they should be so:—because He delights in producing beauty:— and [...] because He acts by general law, and law produces beauty.'⁴⁰⁸

The pretence of the 'as if' had been dropped, and despite pitching the teleological meaning of beauty at a transcendental level in order to resolve the old Paleyan aporia of purposeless purposes, the fundamental problems of natural theological aesthetics were reinscribed in Whewell's solution. Even gestures towards the operation of secondary law as the basis of design had reverted to fiat, with Whewell proposing an explicit link between this teleological form of beauty and organic form in transcendental anatomy, with morphological unity taken as indicative of the same 'tendency,' where the elaboration of a 'general plan [...] goes beyond the circuit of the special adaptation of each animal to its mode of living.'⁴⁰⁹ Beauty – combining a surfeit of rationality with absolute purposelessness – represented the region of indistinction between the lawful and arbitrary. Indeed, given the teleological homology between organic and aesthetic form, although morphology was posed as an abstractive law that described biological structure without recourse to the whims of teleological fiat, the identification of law and beauty thereby acted to collapse the very criteria that first motivated the turn towards morphological theory. For Whewell, the lawful operation of nature manifested in the imbrication of unity of plan and beauty now implied the supplement of 'a rule of creative action, in addition to the rule that the parts shall be subservient to an intelligible purpose of animal life.'⁴¹⁰ So, in 'addition' to the laws of thought that governed the life sciences in Whewell's account in *History and Philosophy*, and parallel

⁴⁰⁶ Ibid., p. 240.

⁴⁰⁷ Ibid., p. 240.

⁴⁰⁸ Ibid., p. 240.

⁴⁰⁹ Ibid., p. 240.

⁴¹⁰ Ibid., p. 240.

to a newly stressed transcendental principle of unity of design, there was an immanent aesthetic principle or logic of composition. Beauty was the abstract formal architecture underpinning creation itself.

In line with its link to unity of plan and the internal logic of law, Whewell framed this aesthetic principle in the same terms as vestigial organs, another of those dysteleological exceptions to utility which had been brandished against the explanatory supremacy of function for morphologists from Geoffroy to Owen. In the same way in which regularity or lawfulness is productive of beauty, 'where parts and features appear, rudimentary and inert, discharging no office in their economy,' they still possess the function of 'speaking to us, not of purpose, but of law:—consistent with an end which is visible, but seemingly the results of a rule whose end is in itself.'⁴¹¹ As with Owen's 'teleology of a higher order,' whatever the teleological challenge of vestigial organs, where they could be resolved into the form of the plan they still possessed a kind of purposiveness, offering testament to the operation of secondary law in nature, and, *specifically because* they had no function, demonstrating lawfulness as such. An adaptive habit of thought could recuperate functionless form as epistemically or aesthetically purposive, and so although lawfulness was framed as the reflexive self-enjoyment of the divine, this lawfulness became epistemically available as the 'utterances of the Creator, delivered in language which we can understand.'⁴¹² The results of the 'rule of creative action' were thereby made purposive *for us* to know them, and where organic form displayed a finality unalloyed by any actual end, its beauty revealed the pure purposiveness of design shorn of determinate utility. In the pure lawfulness of form without teleological content beyond itself (the empty concept of teleology itself), life displayed a purposiveness without purpose that was the ultimate logic of design *simpliciter*. This aesthetic rationality inverted Cuvierian functional integration, with typology, now thought in terms of morphological transformation, characterised as a lawfulness without function that took on function through its very lack of purpose. Whewell pursued beauty as an epistemic operator by which we intuit the lawfulness of all design through the particularity of organic form. The morphological unity evidenced in the beauty of living beings became the privileged vehicle for intuiting the unity of all design.

⁴¹¹ Ibid., p. 240.

⁴¹² Ibid., p. 251.

Where unity was known through the immediate perception of beauty (functioning as a kind of aesthetic cognition), we seem, once more, in the company of an old argument, with the Paleyan intuition of adaptive function now substituted by the intuition of (aesthetic) unity of plan. However, in a way that the Paleyan argument couldn't sustain, Whewell maintained the consistency of his thought by making a purposeless purpose the ultimate teleology of creation. As human reason represented the microcosmic reflection of the divine reason ('alike *Truth* for all minds'), if the logic of design was revealed as ultimately aesthetic, our intuitive access and decoding of this design might likewise know it aesthetically, with our appreciation of form taking on a unique cognitive role.⁴¹³ For instance, Whewell offered a catalogue of the 'innumerable cases' of 'beauties of colour and form, texture and lustre, which suggest to us irresistibly the belief that beauty and regular form are rules of the Creative agency, even when they seem to us, looking at the creation for uses only, idle and wanton expenditure of beauty and regularity.'⁴¹⁴ However, Whewell didn't just restate the apparent paradox that 'beauty and regular form' was the hidden rule of the 'idle and wanton expenditure of beauty,' but, in an effort to make sense of this overwhelming aesthetic profusion of nature, offered a rhetorical set piece that married a catalogue of multifarious instances of beauty – from peacocks to microorganisms – with figures of repetition.⁴¹⁵ Whewell used literary form to model unity in variety, and in a succession of clauses structured as rhetorical questions with the anaphoric refrain (or, punctuated as a sequence of questions, symploce), Whewell asked 'to what purpose [...]?' manifold distinctive examples of beauty served.⁴¹⁶ They served, of course, no purpose beyond standing to 'prove that beauty and regularity, are universal features of the work of Creation.'⁴¹⁷

Yet, the very fact that there was a need to turn to this rhetorical mode is suggestive, with Whewell trying to grasp a lawfulness beyond reason through a *copia* that exhausts rational modes of argument. The beauty and variety of design is exhaustive – overwhelming, even – but somehow captured by a rationality only insofar as it is beyond rationality. As a strategy, *copia* forces the reader or observer to search for unity within variety in the same way they might seek homologies of organic form to know purposeless diversity as lawful. By

⁴¹³ Ibid., p. 251.

⁴¹⁴ Ibid., pp. 240-241.

⁴¹⁵ Ibid., p. 241.

⁴¹⁶ Ibid., p. 241.

⁴¹⁷ Ibid., p. 241.

offering this catalogue of forms of beauty, Whewell not only captured the profusion of nature, but captured it as inspired by a single repetitive rhetorical figure that structures its profusion, like the hidden operation of a formal law that describes the transformations of unity of plan. Like the rationality of textual *copia*, lawful unity reposes behind the inexhaustible aesthetic variety of nature. Whewell, having taken recourse to an aesthetic teleology to save the consistency of design, took recourse to aesthetic means to make this otherwise unthinkable combination of law and arbitrary fiat somehow, at least partially, cognisable. The aesthetic turn of natural theological teleology was borne out within the form of the *Plurality* itself.

To conclude, then, the progress of Whewell's work through the 1840s-50s provides a philosophically sophisticated example of how functionalist natural theology could take up transcendental morphology and make it cohere with its ostensible opposite. In this chapter I have explored various other versions of this interaction – synthetic and antithetic – from the eclecticism of the English translation of Cuvier, to Owen's claim to recover function despite subordinating it to form, or Miller's construction of an idealism that preserved the habitual aesthetic concerns of Anglophone natural theology. In Whewell's case, his mathematical or structural understanding of beauty might spontaneously appear as a renunciation of correspondency as the ground upon which beauty is understood, but, in turn, various transcendental philosophemes were revealed as adaptations that the teleological form of beauty could comprehend. Similarly to Miller, Whewell deployed unity of plan as the central dogma of biological thought, leveraging its teleological homology with beauty as part of a syncretistic and idealist natural theology. What, from the perspective of the functional-adaptational paradigm existed as a kind of null teleological category, provided a way of unifying adaptationism with idealism, offering the unqualified form of finality-as-adaptation to both. The trope of organic form, and the deep homology between the part-whole rationality of the organisation of life and the part-whole organisation of beauty, now took on a unique meaning within natural theological aesthetics, as where Cuvierian functional coherence was abandoned as a criterion of unity, it was replaced with an aesthetic logic of design as *l'art pour l'art* which revealed, through law, the operation of a unified but concealed divine finality. Having been synthesised with the highest generality of law, beauty offered a way to comprehend the totality of nature under the form of the purposeless purpose, and, captured in the idea of the cosmos as a unitary composition, natural theology became a unique kind of aestheticism.

Functional adaptation and transcendental or idealist morphology formed a unified but chiasmic structure; two polarities – beauty-as-adaptation and unity of plan – organised around the central bridging logic of aesthetic teleology as the purposeless purpose of design. Wielding the work of Owen, Whewell had the nous to develop a new teleological settlement for natural theology. Where Paley had driven beauty from utility, Whewell now made utility a form of beauty: the plan was, after all, an aesthetic unity, ‘but this common plan being given, we can discern and admire, in every kind of animal, the manner in which the common plan is adapted to the particular purpose which the animal's kind of life involves.’⁴¹⁸ So, whilst Whewell was now able to think static type and morphological transformation in harmony, his theory still offered no room for the ontologically meaningful becoming of new kinds. Morphogenetic process in the world was the reflection of a transformation that had always-already happened synchronically in the framework of divine laws. Still, where Whewell tried to discover beauty in the interaction between morphological law and adaptive teleology, he offered a way of conceptualising aesthetic form in nature as the complex interaction of multiple teleological modes. In a way that Whewell couldn’t follow, Darwin would now forge an analogous path, trying to think beauty as the teleologically complex product of a morphological dysteleology as it intersected with an adaptive dysteleology.

⁴¹⁸ Ibid., p. 213.

Chapter III

Darwin and the Problem of Beauty

The Fatal Doctrine Again – Kingsley, Huxley and Darwin

Darwin read Whewell's *Plurality* in the May of 1854.⁴¹⁹ The majority of Darwin's reading notes concerned Whewell's transformation of Owenian transcendental anatomy, especially where Whewell's meliorism between 'the principle of "Unity of composition, as well as the principle of Final causes"' was taken to 'exactly [...] agree with descent & selection for advantageous structures.'⁴²⁰ Yet Darwin, despite understanding how morphological evidences could be repurposed to point towards common descent as a historical process of selection and adaptation, was equally aware that focussing on morphological unity still ran the risk of reinventing theistic typology. In Darwin's own words, 'this notion of exemplar or archetype seems satisfactory to minds of high order, but to me it seems only a Reverential way of saying things are as they are.'⁴²¹ Although compelling to many, where a transcendentalist inflection of design abandoned adaptation as a way of explaining form as causally related to the particularity of an environment or habit of life, it no longer clarified anything. The archetype was, in a very real sense, simply the rationalisation of the brute facticity of biological form as we encountered it. With the eclipse of teleology, causes became indiscernible, with Darwin cognisant of how a shift towards morphological unity at the expense of function resulted in the embrace of Divine fiat in all its arbitrariness. Yet still, aspects of form irreducible to natural selection – 'many structures [...] of no direct use to their own possessors' – still had to be accounted for, and Darwin could hardly endorse the view that 'unity of composition' was its

⁴¹⁹ See CUL-DAR128.8.

⁴²⁰ CUL-DAR205.5.143r-v.

⁴²¹ CUL-DAR205.5.143r.

own end as a purposeless purpose to paper over the cracks in the way that Whewell had.⁴²² Nonutility had to be explained, but there was no way for Darwin to make sense of the dysteleology of organic form without fundamentally reshaping the aesthetic rationality that had been used by his peers to understand it. We are returned to the fatal doctrine.

In two linked chapters I now explore the relationship of Darwin's work to the overlooked natural theological aesthetics my first two probed. The present chapter acts as a bridge to my discussion of the Argyll dispute, tracing Darwin's relationship to Kingsley and Huxley's 1850s writing on beauty, and the further problems of aesthetic teleology that Darwin encountered in his career through till the publication of the first three editions of *Origin* (1859-61) and *Orchids* (1862). I detail how Darwin was already, however unsystematically, trying to distinguish between three different kinds of teleological structure by 1862: the regulative functional purposiveness of natural selection, the aesthetic purposiveness of sexual selection, and a morphological dysteleology producing form without purposiveness. Yet, Darwin would describe all three, at various junctures, in terms of aesthetic categories, and so a clear distinction between these modes of purposiveness as they related to beauty remained blurred. Where Darwin provided only limited positive explanation for how beauty and ornament in nature could be comprehended by naturalistic means, natural selection was attacked for its inability (in the same way as Cuvierian-Paleyan functionalism before it) to explain anything more than adaptive utility.

In the following chapter, I explore Darwin's development of an aesthetics from 1862 to 1868 as it followed from Argyll's critique. During this period, the importance of natural theological aesthetics for the structure of Darwin's thought became more visible, not just in the oppositional posture of his theory, but because Darwin imported the explanatory framework of this natural theological tradition (CROE) and rethought it as part of a complex naturalistic teleology. The events leading to the publication of the fourth edition of *Origin* were a decisive moment in Darwin's aesthetics, with the 1866 text of *Origin* representing something like a *Kehre* in his published approach to beauty. Darwin's relationship to aesthetic categories now moved primarily from use – most importantly the natural-selective logic of the 'beautiful contrivance' or 'beautiful adaptation' – towards a more expansive and direct theorisation of beauty. Darwin finally explored the teleological implications of beauty in

⁴²² *Origin*, p. 199.

greater detail, offering a fourfold taxonomy of kinds of beauty. Sexual selection gave Darwin a way to think of certain aesthetic properties in nature as both relational and intrinsic (the fundamental coordinates of CROE), and so develop a dynamic ontology of real beauty as it inhered between subjects and objects in the world. However, response to the idea of sexual selection was mixed, and Darwin was often read – by both friend (Kingsley) and foe (Argyll) alike – in terms of the idealistic inflection of CROE that had become widespread in the 1850s. Darwin would have to innovate again, and using the theoretical framework of pangenesis developed in *Variation* (1868), would rethink beauty as the product of two distinctive causalities – mind and form – as sexual selection sutured them together.

Where Whewell's work represented a synthesis of the habitual concerns of Paleyan natural theology with anatomical idealism, there were those, faced with the apparently insuperable paradoxes of utilitarian design, who abandoned a model of functional adaptation entirely. Amongst the authors who made this leap, framing the cosmos as artwork and forsaking adaptationist teleology to do so, are the two that Darwin singled out in his manuscripts and *Origin* as so subversive of his own: Thomas Huxley and Charles Kingsley.⁴²³ Given the later importance these figures would take on as allies of Darwin – Darwin's bulldog, and 'Darwin's other bulldog' as Piers Hale has put it – this may seem surprising, but in this section I explore how Huxley's and Kingsley's work provides an opening by which we can read Darwin's theory of beauty as the transformation of the natural theological aesthetics developed in the half-century since *NT*.⁴²⁴

Huxley's 1856 Address has been discussed in the context of Darwin before, with Huxley's attack on Cuvierian correlation especially noticed by Gowan Dawson as it represented an episode of Huxley's ongoing dispute with Owen, a controversy Darwin was attentive to.⁴²⁵ However, despite noting one of the major teleological interests of Huxley's broadside against function (where 'Darwin remained interested in the nonadaptational correlational changes in an organism's organisation,' and thereby explain certain instances of dysteleological form), Dawson has made nothing of the aesthetic significance of this address, and, crucially, how Darwin would see Huxley's logic as ultimately destructive for natural

⁴²³ See CUL-DAR11.2.86r.

⁴²⁴ Piers Hale, 'Darwin's Other Bulldog: Charles Kingsley and the Popularisation of Evolution in Victorian England,' *Science & Education*, 21 (2012), 977-1013.

⁴²⁵ *Show me the Bone*, pp. 211-242.

selection.⁴²⁶ Although Huxley is often identified with an almost evangelical scientism and agnosticism, the Huxley of February 1856 was firmly under the sway of a morphological paradigm of design – ‘*Bauplans* and beauty’ as Desmond has pithily condensed it, picking out those two key aspects of natural form that remained irreducible to function.⁴²⁷ In his 1856 speech, Huxley’s target was ‘utilitarian adaptation to purpose,’ exemplified by ‘Paley and the natural theologians’ or the intellectual legacy of Cuvier, the ‘prince of modern naturalists.’⁴²⁸ Huxley attacked teleological functionalism by framing the world as an artwork, and, building on the kind of arguments that had grown in prominence through the 1840s, claimed that the ‘poem’ of ‘living nature’ was better understood by reference ‘to the aesthetic sense as much as the mere intellect.’⁴²⁹ Although this aestheticised form of idealist anatomy provided a standpoint from which he could attack utilitarian teleology, Huxley was therefore, as I hope to have made clear through my conceptual archaeology of CROE, in reality using elements of Paleyan logic as they had been already apparently forgotten.

So, Huxley’s address did not reject design *per se*, or even a wider teleological architectonic of nature, but represented – as Huxley himself phrased it – only the specific rejection of ‘utilitarian adaptation to a benevolent purpose’ as ‘the chief or even the leading feature of that great shadow’ or ‘vast archetype of the human mind, which everywhere looms upon us through nature.’⁴³⁰ The usual coordinates of nineteenth century design arguments (the intuitive discovery of anthropomorphic mind motivating the structure of the world etc.) remain readily discernible, but instead of Huxley figuring this system as one of utilitarian adaptational correspondencies, his claim was that nature itself ‘tells us that utilitarian adaptation to purpose is not the greatest principle worked out in nature, and that its value [...] has been enormously overrated.’⁴³¹ Thus, in the same move already encountered in both Owen and Whewell’s work, this rejection of the cornerstone of functional-teleological accounts of biological structure did not represent a denial of our capacity to discover an

⁴²⁶ Ibid., p. 223.

⁴²⁷ Desmond, *Huxley*, p. 200. See pp. 222-223 for a characterisation of Huxley’s thought during this period. For Huxley’s theological consequence in a scientific domain, see Paul Stanley, *Huxley’s Church and Maxwell’s Demon* (Chicago: University of Chicago Press, 2014).

⁴²⁸ Huxley, ‘On Natural History,’ pp. 189-90.

⁴²⁹ Ibid., p. 193.

⁴³⁰ Ibid., pp. 189-90. In keeping with this vision of nature as poem, Huxley’s ‘great shadow’ is an explicit reference to Tennyson’s *In Memoriam*. See, Alfred Tennyson, *In Memoriam* (London: Moxton, 1850), xcvi.

⁴³¹ Ibid., p. 190.

‘indication of that vast harmony with [our] own nature.’⁴³² Instead, a distinctive *aesthetic sense* took on the cognitive labour of utilitarian rationality, with Huxley making a relational structure of epistemic-aesthetic purposiveness foundational for a philosophy of nature:

it may be regarded as one of the noblest characteristics of natural history [sic.] knowledge, that its highest flights point, not to a discrepancy between the infinite and the finite mind, but to a higher and closer union than can be imagined by those whose studies are confined to the physical world. For where the principle of adaptation, of mere mechanical utilitarian contrivance fails us, it is replaced by another which appeals to the aesthetic sense as much as the mere intellect.⁴³³

Cognition through the ‘aesthetic sense’ represents a way of grasping the hidden totality – ‘the vast archetype’ – behind the phenomenologically available forms of the natural world. Boyle’s ‘Country Fellow’ had the last laugh.

Unsurprisingly, a designed aesthetic sense points us towards the aesthetic rationality of design itself, and Huxley’s examples of organic form that confuted ‘utilitarian contrivance’ – ‘beauty of outline and colour,’ ‘geometrical regularity,’ or ‘extreme variety and elegance’ – were those already seen in the works of natural theological authors, and later taken up by Darwin, including ‘birds,’ ‘butterflies,’ ‘or a group of foraminifera, sifted out of the first handful of sea sand.’⁴³⁴ Like Miller and Whewell before him, the old criterion of unity amidst variety was updated to make sense of this aesthetic design, with Huxley pronouncing it ‘absurd’ that functionalism could serve as a meaningful paradigm for understanding ‘the harmonious variation of a common plan which we find everywhere in nature.’⁴³⁵ This logic was universalised, and it became the ‘plain teaching of Nature’ that the cosmos was an aesthetic artefact: ‘not a mechanism but a poem; not a mere rough engine-house for the due keeping of pleasure and pain machines, but a palace [...] whose superstructure is a manifestation of the highest and noblest art.’⁴³⁶ Aesthetic appreciation was sublimated as the vehicle of higher knowledge, with the commonplace epistemic correspondency argument of

⁴³² Ibid., p. 192.

⁴³³ Ibid., pp. 192-3.

⁴³⁴ Ibid., p. 193.

⁴³⁵ Ibid., p. 193. Indeed, where Huxley’s aesthetics has been discussed before, uniformity amidst variety has been seen as its central category; see Charles Blinderman, ‘T.H. Huxley’s Theory of Aesthetics: Unity in Diversity,’ *The Journal of Aesthetics and Art Criticism*, 21 (1961), 49-55.

⁴³⁶ Huxley, ‘On Natural History,’ p. 193.

natural theology now rendered in terms of the relation of aesthetic sense; an aesthetic sense which discovers in nature a 'poem' or 'palace.'

So, whilst still recognisably deploying CROE in its idealistic inflection, Huxley now subordinated this pleasure as a stage within the 'union' of the 'infinite and finite mind.' Where, for instance, Huxley framed 'science' as a 'knowledge [which] opens up continually new sources of intellectual delight' he made the addendum that 'neither knowing nor enjoying are the highest ends of life.'⁴³⁷ Instead, Huxley framed this scientific aesthesis as *paideia*; as the 'careful discipline of all the faculties' or 'training, which the pursuit of science, is above all things, competent to give.'⁴³⁸ Similarly to Kames, Huxley understood a cultural pursuit as ensuring our faculties became what they somehow always were, and subverting the theodical logic of adaptation that pointed towards benevolence or moral good (Hutcheson, Paley, Macculloch), the scientific endeavour that allowed us to appreciate the 'poem' of nature was now thought of as the realisation of the taste of God as it was reflected in human taste:

if we have a right to conclude from the marks of benevolent design to an infinite Intellect and Benevolence, in some sort similar to our own, then from the existence of a beauty [...] and of an predominant harmonious variety in unity in nature, which, if the work of man, would be regarded as the highest art, we are similarly bound to conclude that the aesthetic faculties of the human soul have also been foreshadowed in the Infinite Mind.⁴³⁹

As we have already seen in the morphological inflection of CROE, any question of whether the 'highest art' (nature) is specifically designed *for* humanity loses its force. We take pleasure in what the 'Infinite Mind' has made for the sake of aesthetic purposiveness because we partake in its same essence. For Huxley, the binding and knowable relationship between divinity and the material world was a shared aesthetic sensibility; a divine emanation of the beautiful of which we could partake. Natural history, as a 'gymnastic for the intellectual, the moral, or the æsthetic faculty' coached us and disciplined us such that we might have access

⁴³⁷ Ibid., p. 188.

⁴³⁸ Ibid., p. 188.

⁴³⁹ Ibid., p. 188.

to the aesthetic condition of creation, a scientific aesthesis subsequently prized because it undermined the utilitarianism of appeals to direct design.⁴⁴⁰

The link between the 'aesthetic faculties of the human soul' and the 'Infinite Mind,' are the key tension that motivates the other key intertext of the fatal doctrine: Charles Kingsley's *Glaucus* (1855). As Johnathan Smith has explored, the 1850s saw an 'explosion of interest in seaside natural history,' with the attendant flowering of a specific genre of popular natural historical writing, the so-called 'seaside books.'⁴⁴¹ Within such seaside writing, a popular, specifically natural theological subgenre itself arose (Phillip Henry Gosse amongst the most notable authors writing in this strain), and although *Glaucus* was just one example of this thriving popular subgenre, with Kingsley fishing homilies from rock pools, Darwin still read *Glaucus* as directly impinging on natural history proper, most decisively in its troubling vision of an aesthetically motivated creation.⁴⁴² Like Hugh Miller's works in the 1840s, Darwin took Kingsley's arguments seriously, particularly in their perturbing teleological implications. In line with Darwin's reading, my particular interest in Kingsley's *Glaucus* follows its metaphysical direction of travel, exploring how Kingsley transformed CROE into a kind of *mysticism* to make sense of the otherwise senseless aesthetic motivation of the cosmos.

Darwin's own notes mark out the relevant portion of Kingsley's discussion of beauty in *Glaucus*.⁴⁴³ Similarly to Huxley, Kingsley's use of beauty and 'prodigal variety' was directed against any paradigm of utility, framed through an apostrophic address to an imagined 'worshipper of final causes and the mere useful in Nature,' with Kingsley's examples of such beauty and variety the same commonplaces that have recurred throughout my analysis thus far (and would recur in Darwin's writing): Nudibranchs, butterflies, and 'those strange microscopic atomies, the *Diatomaceae* and *Infusoria*.'⁴⁴⁴ Like Huxley, for Kingsley there was no good reason for the variety or beauty of such beings that could be adduced on the register of adaptive function. For example, all Nudibranchs 'live in much the same way' and the extravagant differences of form that exist between species cannot be understood by 'any utilitarian theory of nature.'⁴⁴⁵ Equally, butterflies – their wing 'scales [...] arranged to produce

⁴⁴⁰ Ibid., p. 193.

⁴⁴¹ Smith, p. 60.

⁴⁴² See Ibid., pp. 77-91; See also *Victorian Sensation*, pp. 452-3.

⁴⁴³ CUL-DAR11.2.86r; Kingsley, pp. 100-101.

⁴⁴⁴ Ibid., pp. 100-101.

⁴⁴⁵ Ibid., p. 100.

a certain pattern of artistic beauty beyond all painter's skill' – were claimed as an 'unfathomable triumph of design.'⁴⁴⁶ Kingsley's strategy was to invert the adaptive functionality he took to characterise the Paleyan tradition by prising 'unfathomable' exceptions to utility. So, although 'honest induction, as Paley so well teaches, allows us to ascribe such results only to the design of some personal will and mind,' such induction no longer discovers the utility of contrivance, but instead forever discloses new instances of purposeless form.⁴⁴⁷

By this revelation of 'personal will and mind' in the form it produces, Kingsley's focus on Diatoms and Infusoria reveals its importance, instantiating the paradox of an aesthetic design that *cannot* be seen. Like Miller's ichthyolites, Diatoms were notable not only for their sheer profusion and their remoteness, but also their 'mathematical beauty,' described as 'tiny shells of flint as fantastically various in their quaint mathematical symmetry, as they are countless beyond the wildest dreams of the Pantheist.'⁴⁴⁸ Both 'fantastically various,' but strictly mathematically determined in their form, their design was 'inexplicable' for Kingsley on the 'conceited' principle that humanity is the 'centre and the object of their existence.'⁴⁴⁹ The beauty, variety and complexity of nature no longer testifies to the coadaptation of nature to our capacities and tastes as its presiding logic, but, instead, exists as the principle of the decentring of humankind. Through the discovery of beauty we can no longer believe ourselves to be the 'centre of the universe,' when to think otherwise would be to believe that this 'variety of forms has existed for countless ages in abysmal sea-depths and untrodden forests, only that some few individuals of the western races might, in these latter days, at last discover and admire a corner here and there of the boundless realms of beauty.'⁴⁵⁰ For Kingsley, such phenomena are only 'explicable enough to him who believes that God has created all things for Himself, and rejoices in His own handiwork.'⁴⁵¹ On this basis, the 'material universe' should be understood as a ludic arena of aesthetic play, or, in Kingsley's unacknowledged invocation of Jakob Böhme – 'a platform whereon His eternal Spirit sports

⁴⁴⁶ Ibid., p. 100.

⁴⁴⁷ Ibid., p. 100.

⁴⁴⁸ Ibid., p. 101.

⁴⁴⁹ Ibid., p. 101.

⁴⁵⁰ Ibid., p. 101.

⁴⁵¹ Ibid., p. 101.

and makes melody.⁴⁵² Considered in this light, Kingsley's idealistic inflection of CROE was a resurrection of mysticism, with the relational framework used to understand aesthetic properties maintained, but now comprehended in terms of divine self-relation. The search for beauty, companion of the search after truth, became an unending quest. Everything we discover, and everywhere we turn to look, shows itself to partake in the reflexive relationship of the divine taste. Our aesthetic enjoyment of the world, the image of the divine self-enjoyment, was parasitic upon this relationship; a self-relationship of the transcendental that *was* the material world.

Kingsley's vision of an aesthetic design verging on mysticism might seem so remote from natural selection (Darwin's own version of the 'utilitarian doctrine') that any specific comparison with Darwin's thought is meaningless. It was self-evident (not least to Darwin), that if the Kingsley or Huxley was correct, Darwin's theory wouldn't work. It is important to try and draw out why it was particularly *this* approach to beauty that was so destructive for Darwin's theory, and how specific comparisons between them remain informative. In my mind, Kingsley and Huxley do not just happen to represent the resources that Darwin read, indifferently, at the time of the composition of *Origin* and became his reference, but spoke directly to a problem that had occupied Darwin since he was a young man voyaging on the Beagle: what kinds of purposes did the natural world produce, and what kind of ends were real in nature? How to account for both utility and non-utility as distinctive kinds of *value* in nature without, ultimately, simply assuming divine fiat? Many have detailed in great depth how Darwin's writing was 'thick with value,' from George Levine's vision of Darwinian science as a kind of 'secular re-enchantment,' to Robert Richards, for whom Darwin's 'value laden' image of nature was realised in natural selection as the theoretical vehicle of a 'moral conception of nature and of its progressive intent.'⁴⁵³ But what of aesthetic value, as the posit of beauty as a unique finality within nature? To understand the fatal doctrine as it emerged in *Origin*, we must step backwards in time, and see how the young Darwin was first unsettled by the beauty of design.

⁴⁵² Ibid., pp. 101-102. Kingsley does not identify this reference, but it is almost certainly a paraphrase of Böhme's *Signatura Rerum* – 'The Creation is the same Sport out of himself, viz. a Platform or Instrument of the Eternal Spirit, with which he melodizeth.' See Jakob Böhme, *Signatura rerum, or, the Signature of all things*, trans. by John Ellistone (London: Macock, 1651), p. 192.

⁴⁵³ George Levine, *Darwin Loves You* (Princeton: Princeton University Press, 2008), p. 39; *Romantic Conception*, pp. 533-540; 'Natural Selection and its Moral Purpose,' p. 66.

Finding a Purpose in Life

It was 1832, and the Paleyans were in their heyday. A young man, himself in thrall to Paley, 'charmed & convinced by [his] long line of argumentation,' was on a voyage.⁴⁵⁴ Of all the cascading epiphanies that would follow from that journey, there was also an aesthetic awakening for the young Darwin. That something peculiarly aesthetic happened to Darwin on the voyage of the *Beagle* has hardly escaped notice, from Evelleen Richards' focus on the 'shock' of the young Darwin's encounter with the Fuegians, to Robert Richards' stress upon the 'Humboldtian light' that structured Darwin's experience of tropical luxuriance as a form of Romantic ecological intuition, or Ian Duncan's account of voyaging as an aesthetic attentional practice, 'governing the discernment of form in art and nature' as the 'matrix of scientific knowledge.'⁴⁵⁵ Yet what hasn't been noted before was a different aesthetic shock that Darwin experienced on this journey, itself unremarked upon in the *Journal of Researches* but manifest in Darwin's diaries and manuscripts, when the good young Paleyan was struck not by the grandeur of design, but by the beauty of nature as the collapse of the utility underpinning that design. In the *Beagle Diary* entries for 10th and 11th January 1832, Darwin made notes on some of his surveys of marine life, using trawl netting attached to the stern of the *Beagle*.⁴⁵⁶ On the first day Darwin described his apparatus in the language of *technē*, as having 'proved [...] the utility of a contrivance which will afford me many hours of amusement & work.'⁴⁵⁷ Yet, on the second day Darwin recorded the shock of his encounter with the results of this surveying, noting that beauty appeared to directly conflict with the teleological rationality of design: 'Many of these creatures so low in the scale of nature are most exquisite in their forms & rich colours. — It creates a feeling of wonder that so much beauty should be apparently created for such little purpose.'⁴⁵⁸ Darwin's search was for purpose, but beauty seemed to undercut any rational consideration of purpose *because* it was a real end of design.

The presiding irony of this scene was that through this very exercise in functional rationality, framed by the language of 'contrivance,' Darwin would go on to discover a myriad

⁴⁵⁴ CUL-DAR26.30.

⁴⁵⁵ Evelleen Richards, pp. 3-34; *Romantic Conception*, p. 524; 'Natural Histories of Form,' p. 56.

⁴⁵⁶ Charles Darwin, *Beagle Diary*, ed. by Richard Keynes (Cambridge: Cambridge University Press, 1988), pp. 21-22.

⁴⁵⁷ *Ibid.*, p. 21.

⁴⁵⁸ *Ibid.*, p. 22.

of beings whose beauty belied this same model of rationality as it had been universalised by figures such as Paley to understand natural beings *in toto*. If beauty was an end of design, design as the specific intuition of functional *technē* in natural forms was undercut, with Darwin, engaged in natural historical praxis, discovering the paradox of Paley's second teleology (the purposeless purpose) in the world at large. Adverting once more to Daston's characterisation of natural theology as a mode of attentional practice, a 'regimen of observations' founded in one model of the teleology of design discovered beings that could only be made meaningful in terms of a radically different representation of purposiveness.⁴⁵⁹ Darwin was left pondering the teleological rift of natural theology. 'Wonder,' through its very ambiguity, had a pivotal role at this logical threshold, as pious scientific awe at design transformed into an unsettling questioning of creation, with the defamiliarising experience of beauty in natural beings cashed out on a teleological register. Beauty and variety, especially in 'creatures so low in the scale of nature,' represented an excessiveness to design *within* design that strained its plausibility. Darwin's credence in the fiat of special creation reached its cognitive limit in beauty, with the apparent incongruity of purposeless form lavished on marine invertebrates experienced as the unweaving of the ordained hierarchy of the *scala naturae*.

Six years later, and with his belief in *direct* design having waned, in his earliest transmutation notebook Darwin returned the same question of whether beauty, as a kind of purposeless purpose, was a distinctive end of creation. Darwin framed the idea of aesthetic finality in terms of a universal history or progressively realised *telos* of creation ascending from low to high; that 'when we talk of higher orders, we should always say intellectually higher. — But who with the face of the earth covered with the most beautiful savannahs and forests dare to say that intellectuality is only aim in this world.'⁴⁶⁰ The question of 'highness,' a narrative of progression from materiality to mind, must find room for the appreciation of beauty as an intrinsic finality within the world. However, despite being an 'aim' within the rational history of creation, beauty doesn't possess the same teleological structure of those other 'higher orders' of intellectual ends, instead implicating a mode of purposiveness that derails any simple account of a *telos* of universal history. As Darwin discovered years before

⁴⁵⁹ Daston, p. 114.

⁴⁶⁰ CUL-DAR121.252.

on a distant ocean, beings ‘low in the scale of nature’ were equally marked by beauty, and therefore also somehow partook of this key form of ‘highness’ within nature.

It wasn’t just beauty that caused Darwin problems during these years, with the same aporia of purposeless purpose inhering within other forms of dysteleology as they would one day be expressed in the fatal doctrine of the *Origin*. For instance, Darwin read Browne’s *Religio Medici* in 1838, struggling to understand how *natura nihil agit frustra* [nature does nothing in vain] could be made to cohere with the dysteleological paradoxes of monstrosity and otherwise purposeless ‘vestiges’ of unity of plan.⁴⁶¹ The old maxim deployed by Cuvier’s translators to make Geoffroy’s morphology cohere with function was now troubling Darwin, for whom morphogenetic accident and morphological unity self-evidently didn’t manifest functional design. Similarly, claimed variety for its own sake exercised Darwin in the C Notebook, where the proliferation of natural kinds discovered in the world revealed *ad absurdum* the pointlessness of explanatory appeals to direct design: ‘an Entomologist going into a country & collecting thousands & tens of thousands new insects, perhaps scarcely one new family & no new order. — Wonderful, partly explained on my theory, & otherwise mere fact creator chooses so to create.’⁴⁶² The teleological problems of unity of plan had returned, as, if all these species were actively assumed as ordained ends, as so many variations upon a theme, the differentiae of many beings had no fundamental rationality beyond the kind of aesthetic criteria I have analysed from Hutcheson through to Whewell. For Darwin, at least, this was an insuperable problem for design arguments. Yet, even if variety could be partially tamed by descent with modification, beauty remained a particular problem. In Darwin’s early view beauty remained a real property in the world and a real end of creation, and so the purposive without purpose – the teleological form of beauty – remained an active element in the development of the metaphysical coordinates of Darwin’s theory. The ultimate issue, of course, was what this beauty was for, and, if it had no other purpose, *who* this beauty was for: humanity? – other animals? – God?

These were questions that would hang over Darwin for decades, and twenty years later he prized Kingsley and Huxley’s work because, ‘carried to [an] extreme,’ it provided a way to conceptualise the teleological problems that so exercised contemporary philosophical

⁴⁶¹ See CUL-DAR123.53e-56e; Browne, pp. 28-9.

⁴⁶² CUL-DAR122.200.

and scientific figures as they attempted to understand the significance of purposeless biological form.⁴⁶³ For instance, reading Wallace's *Travels on the Amazon* (1853) at some point around 1856-8, Darwin wrote a brief memorandum regarding Wallace's struggle to rationalise the differences that inhered between different species of birds, which, 'having scarcely any resemblance to each other, [and] yet feed on the same food and inhabit the same localities, cannot have been so differently constructed and adorned for that [functional] purpose alone.'⁴⁶⁴ Variety and ornament – beauty and diversity – the two key aesthetic criteria of design, remained, and so 'naturalists' were forced to 'look beyond' the 'marvellous adaptation of animals to their food, their habits, and the localities in which they are found.'⁴⁶⁵ There must be, as Wallace put it, 'some other principle regulating the infinitely varied forms of animal life.'⁴⁶⁶ Having become his ready intertexts for understanding this kind of dysteleological issue of form, Wallace's question was, for Darwin, yet one more example of 'Kingsley's and Huxley's idea.'⁴⁶⁷

Given the teleological significance of natural selection, this was not a problem Darwin could leave unresolved. The 'utilitarian doctrine' of both Paleyan-Cuvierian adaptationism *and* natural selection was, as Darwin himself stressed with reference to Paley, one of functional advantage cashed out in terms of an abstract 'good' ('natural selection acts solely by and for the good of each. No organ will be formed, as Paley has remarked, for the purpose of causing pain or for doing an injury to its possessor').⁴⁶⁸ Species became adapted through the differential survival of individual variations, a process of struggle which represented, as Ospovat has characterised it, a relativised form of Paleyan 'perfect adaptation,' or, for Kohn, a sort of secular theodicy of selection stripped of its natural theological contexts.⁴⁶⁹ Where Darwin's theory was, as the received wisdom goes, a utilitarian vision of differential survival in the universe of Hobbes-Malthus-De Candolle – *bellum omnium contra omnes* – room had to be made to account for exceptions without reinventing theistic arguments of the purposeless

⁴⁶³ CUL-DAR205.3.156.

⁴⁶⁴ Alfred Russel Wallace, *A Narrative of Travels on the Amazon and Rio Negro* (London: Taylor, 1853), p. 84.

⁴⁶⁵ *Ibid.*, p. 83.

⁴⁶⁶ *Ibid.*, pp. 83-84.

⁴⁶⁷ CUL-DAR205.3.156.

⁴⁶⁸ *Origin*, p. 201.

⁴⁶⁹ 'Darwin's Ambiguity,' Ospovat, p. 77. See also Robert Young, pp. 23-56.

purpose.⁴⁷⁰ This could be partially achieved on the register of function itself, as even if the value (the ‘good’) of adaptation was thought in Paleyan terms, this remained Paleyan utility upended. As Darwin put it, ‘natural selection tends only to make each organic being as perfect as, or slightly more perfect than, the other inhabitants of the same country with which it has to struggle for existence.’⁴⁷¹ The ‘degree of perfection attained under nature’ was only ever relative, and determined by local, concrete and material circumstances.⁴⁷² Given this constitutive relativity, although natural selection aimed only at the ‘good’ considered as functional optimisation, ‘natural selection will not produce absolute perfection, nor do we always meet, as far as we can judge, with this high standard under nature.’⁴⁷³ Natural selection was a sorting operation that only ever produced advantage ‘on the whole,’ with this negative or relativistic framing of perfection allowing Darwin to give room to the arbitrary, dysteleological or maladaptive structure that characterised organic beings, despite wagering so much on functional advantage as the primary driver of descent with modification.

Decisively, however, the problem of the fatal doctrine was not the relativisation of function, or whether natural selection was a genuine teleology, but the disappearance of function as the regulatory ideal by which we judge organic form, and so the question of a value within nature linked to something other than the ‘good’ of utilitarian advantage. As I discussed in the introduction, the interesting question of Darwin’s teleology is not whether natural selection is a real teleology or not. Instead, we must ask whether Darwin proposed multiple types of finality in nature, and therefore whether there were *several kinds* of teleology operating in Darwin’s thought. Beauty is particularly important in this regard, because it is not just one of the other kinds of non-function that Darwin proposed in response to the fatal doctrine, from the effects of ‘laws of inheritance, reversion [and] correlation of growth,’ to the direct action of ‘physical conditions [which] probably have had some little effect on structure, quite independently of any good thus gained.’⁴⁷⁴ Over against this dysteleological order of efficient causes that produces organic form that cannot be understood in terms of utility, beauty – and its genesis – was still governed by a real teleology.

⁴⁷⁰ For Malthus’ role in Darwin’s thought, see M. Hodge and David Kohn, ‘The Immediate Origins of Natural Selection’ in *The Darwinian Heritage*, ed. by David Kohn (Princeton: Princeton University Press, 1985), pp. 185-207.

⁴⁷¹ *Origin*, p. 201.

⁴⁷² *Ibid.*, p. 201.

⁴⁷³ *Ibid.*, p. 202.

⁴⁷⁴ *Ibid.*, pp. 199-200.

Beauty was not simply a question of laws of, *inter alia*, morphogenesis and inheritance, but an end produced by agency directed towards an aesthetic goal.⁴⁷⁵ As *Origin* framed the general point relative to birds, 'female birds, by selecting, during thousands of generations, the most melodious or beautiful males, according to their standard of beauty,' thus adapt the form of males to the representation of that 'standard of beauty.'⁴⁷⁶ Sexual selection, through an iterative process of mate choices, materialised an idea of beauty and made aesthetic form purposive. Hidden close to the surface of this theory was the posit of a causal loop between mind and world, which, as Darwin would put years later in *Descent*, where females search after an aesthetic value in mate choice, 'he who admits the principle of sexual selection will be led to the remarkable conclusion that the cerebral system [...] has indirectly influenced the progressive development of various bodily structures and of certain mental qualities.'⁴⁷⁷ Not only was the aesthetic relationship between a faculty of taste and its object real, but the aesthetic had a distinctive causal influence more generally. Thus, understanding Darwinian beauty doesn't imply any *degree* of value thought relative to the utilitarian doctrine, but *kinds* of value, and through this, the eclipse of function as the sole regulatory ideal by which we cognise organic form as possessing a positive teleological meaning.

As had troubled Darwin since his youth, conflicting visions of value in nature were reflective of conflicting models of what kinds of finality or purposiveness were present within the cosmos. The faults were already there in Paley's work, and the critique mounted by figures such as Kingsley and Huxley comprehended both natural theology and (proleptically) Darwin's theory together. Fifty years of struggle regarding the teleological aporia of aesthetic design now threatened to collapse the utilitarian paradigm by which many thinkers still came to evaluate and know the natural world. Unless it could be tamed, beauty was, in both Darwin's early experience in the field, and through the potential ramifications of the fatal doctrine, something close to a crisis of representation regarding the world as a whole.

⁴⁷⁵ See *Origin*, pp. 87-90.

⁴⁷⁶ *Ibid.*, p. 89.

⁴⁷⁷ *Descent*, II, p. 402.

The Many Meanings of Beauty

Beauty, however, couldn't be so easily tamed, because Darwin still didn't have a way to understand aesthetic properties in all their distinctive teleological implications.

In this section I prepare the immediate ground for my discussion of the Argyll dispute, exploring how Darwin offered several meanings of beauty in the early editions of *Origin* (1859-61) and *Orchids* (1862), but had no developed framework by which to make these multifarious significations of beauty cohere. This confusion of senses of beauty was reflective of three distinctive teleological claims, a.), natural selection as functional purposiveness; b.), sexual selection as aesthetic purposiveness (aesthetic dysteleology); and c.), morphological laws that had no teleology, but were still cognised in terms of an exception to function (dysteleology proper). Yet, this unresolved complexity would invite several misapprehensions and criticisms of Darwin during these years, including Argyll's response to *Orchids*. That Darwin's work offered up several distinctive meanings of beauty has attracted commentary, with, for instance, Jane Munro noting that there was a 'dual sense of beauty that Darwin explored in his own work,' split between the "ornamental' or decorative beauty operating in the context of sexual selection' and, on the other hand, 'beauty as applied fitness to purpose.'⁴⁷⁸ So, in this image of Darwin's thought, beauty was a function of a parallel framework, with a utilitarian causal process producing one kind of beauty (an analogue of the Paleyan beautiful contrivance), with a second, nonutilitarian kind of beauty produced by sexual selection. As I discussed in the introduction, Evelleen Richards has likewise understood Darwin in terms of this distinction, identifying beauty with this second selective process as it undercut the utility of the first. However, my claim in this section is that Darwin was already beginning to contend with a third teleological significance of beauty, which destabilises this parallel construction of aesthetic form in terms of complementary kinds of purposiveness. Where the beauty of form was associated with morphological or efficient causal laws (a dysteleology properly speaking) that had no final causal explanation, the neat explanatory distinction between dichotomous but complementary teleologies of selection broke down. Although, as yet, Darwin had no framework by which to comprehend all these senses of

⁴⁷⁸ Jane Munro, 'More Like a Work of Art than of Nature: Darwin, Beauty and Sexual Selection,' in *Endless Forms*, ed. by Donald and Munro, pp. 253-293 (p. 263).

beauty consistently, Darwin was forced to begin exploring this distinction as his confused readers identified instances of beauty that didn't obey any logic of utilitarian or aesthetic purposiveness.

To begin, I focus on the first kind of beauty – beauty as utility –, which itself occasioned serious issues in the reception of Darwin's work. Natural selection was first and foremost a theory of the adaptation or contrivance, and Darwin was perfectly transparent regarding his intellectual motivations. For instance, as Darwin wrote to Hooker at the period of the publication of *Orchids* (1862) defending himself against Hooker's and Lyell's charge 'that I have [made] too much of a Deus of N.Selection [as the mechanism of transmutation],'⁴⁷⁹ for Darwin 'my enormous difficulty for years was to understand adaptation, & this made me, I cannot but think rightly, insist so much on N. Selection.'⁴⁷⁹ Given the explanatory supremacy of functional adaptation, we might understand the underlying argumentative architecture of *Origin* as the use of the Paleyan argument against Paley. Thus, the presiding stylistic irony of *Origin* was that it accorded the aesthetically predicated adaptation or contrivance the role of its key explanatory premise – both *explanandum* and *explanans* – and, in this sense, used the same generic resources as the Anglophone natural theological tradition (ranging, as I have explored them, from Boyle to Ray to Paley). For Darwin it was imperative to show how 'the innumerable species inhabiting this world have been modified, so as to acquire that perfection of structure and coadaptation which most justly excites our admiration.'⁴⁸⁰ Our admiration of structures in the natural world was directly relevant to a theory of transmutation, with our epistemic relationship to adaptive structures at least partially determined in an aesthetic modality. An aesthetic grasp of adaptive properties led us to properly understand the 'beauty and infinite complexity of the coadaptations between all organic beings, one with another and with their physical conditions of life.'⁴⁸¹

However, given the heritage out of which Darwin was writing, this was not rhetorically or cognitively innocent, especially when only utility could be viably naturalised in the terms of natural selection. Darwin used the language of Paley to describe a non-Paleyan theory, but, like Paley before him, in positing beauty as both a real end in nature as well as using the language of the 'beautiful adaptation' or 'contrivance,' did little work to make these two

⁴⁷⁹ Letter to J. D. Hooker [after 29th] November 1862, *Correspondence* x.

⁴⁸⁰ *Origin*, p. 3.

⁴⁸¹ *Ibid.*, p. 109.

teleologically distinctive claims cohere. Such potentially problematic aspects of Darwin's style have long been noted regarding Darwin's argument in *Origin*, where, in the words of Robert Young, 'the anthropomorphic conception of *selection* with all its voluntarist overtones' was central to Darwin's rhetoric in cognising and constructing natural selection through a metaphorical vehicle.⁴⁸² Given that Darwin overtly framed natural selection in terms of a human agency aimed at utilitarian value ('natural selection is daily and hourly scrutinising, throughout the world, every variation, even the slightest; rejecting that which is bad, preserving and adding up all that is good; silently and insensibly working, whenever and wherever opportunity offers') it is no surprise that an extensive literature has developed anatomising some of the difficulties Darwin faced in 'precipitating his theory against the grain of the language available to tell it in.'⁴⁸³ Beauty was no exception, as it apparently implied an aesthetic teleology, but one that natural selection gave no resources to understand.

By even proposing a sketched form of sexual selection as responsible for some of the 'many structures' otherwise 'created for beauty in the eyes of man, or for mere variety,' Darwin allowed that there was a real beauty in the world that existed as an end in or of nature properly speaking. So, although Darwin claimed that *some* beauty was real, and, within the hermeneutic framework of CROE, his readers understood beauty was real, sexual selection could only account for a fraction of the beauty that *Origin* was filled with and claimed for the natural world. Darwin's 'entangled bank' with its 'endless forms most beautiful and wonderful' is almost proverbial, but sexual selection could do very little labour in explaining much of this beauty.⁴⁸⁴

In the third chapter of *Origin*, where Darwin provided his first extended exposition of the idea of the 'Struggle for Existence' as the Malthusian insight at the heart of natural selection, this logic of the aesthetically predicated adaptation as *explanandum* reached its apogee:

How have all those exquisite adaptations of one part of the organisation to another part, and to the conditions of life, and of one distinct organic being to another being, been perfected? We see these

⁴⁸² Young, p. 87.

⁴⁸³ Beer, p. 3; *Origin*, p. 84. Young has framed the issue as 'the seemingly impossible problem of providing *directionality* without *progression*' (Young, p. 85). For Smith, Darwin's dilemma was that of 'trying to deny the existence of a supervising agent in the evolution of species [where] agency is built into the structure of grammatical form' (Smith, p. 16).

⁴⁸⁴ *Origin*, pp. 489-90.

beautiful co-adaptations most plainly in the woodpecker and missletoe; and only a little less plainly in the humblest parasite which clings to the hairs of a quadruped or feathers of a bird; in the structure of the beetle which dives through the water; in the plumed seed which is wafted by the gentlest breeze; in short, we see beautiful adaptations everywhere and in every part of the organic world.⁴⁸⁵

The aesthetic shock of the world as it was expressed in *Origin* was not simply a contextless demand to explain 'how [...] exquisite adaptations [have] been perfected', but, insofar as it was a specifically aesthetic shock regarding 'beautiful,' 'exquisite' and 'admirable' etc. form, represented a mode of attention prestructured in line with the fundamental concerns and categories of a natural theological aesthetics of contrivance. Darwinian nature was characterised by an anthropomorphic rhetoric of beauty, functionality, and, indeed, *technē*. This characteristic of Darwin's style was noted by those around him at the time, as this short anecdote offered by his son Francis Darwin regarding *Origin* made clear:

Thus in the 'Origin' [...] there is a description of a larval cirripede, "with six pairs of beautifully constructed natatory legs, a pair of magnificent compound eyes, and extremely complex antennæ." We used to laugh at him for this sentence, which we compared to an advertisement. This tendency to give himself up to the enthusiastic turn of his thought, without fear of being ludicrous, appears elsewhere in his writings.⁴⁸⁶

Although Francis Darwin pitched his commentary in such a way that the 'ludicrous' aspects of Darwin's writing were opened to mockery, this 'simplicity, bordering on naïveté' evidenced in Darwin's stylistic enthusiasm was somehow a guarantee of truth. By being so emotionally involved in the minutiae of observation – and therefore not interested in stylistic decorum – Darwin's 'absence of pretence' revealed a 'personal sweetness of character' and so a candour or veracity that was a symptom of truth *because of its very subjectivity*.⁴⁸⁷ Eccentricity or singularity became the guarantee of epistemic *ethos*. Where this emotional enthusiasm (*energia*) was linked to detailed ekphratic description (*enargeia* or *hypotyposis*), Darwin was literally selling a vision of beings as if they were mechanical or technological consumer objects, 'beautifully constructed' to some end, and doing so at the risk of ridicule. All well and

⁴⁸⁵ Ibid., pp. 60 – 61.

⁴⁸⁶ Francis Darwin, *The Life and Letters of Charles Darwin*, 3 vols (London: John Murray, 1887), I, p. 155. See also CUL-DAR140.3.1.159 and *Origin*, p. 441.

⁴⁸⁷ Ibid., p. 441.

good, yet, in this ‘advertisement’ the distinction between description as *hypotyposis* and description as *ekphrasis* was not innocent, with the possible blending of these ways of thinking about theoretically informed descriptions of living being representing the difference between treating the vividly described beautiful adaptation *as if* it were a work of technological or sculptural art in order to understand natural purposiveness, and the claim that it really was a technical object as comprehended within the discursive regime of natural theology, and so *ekphrasis* of a real artefact.

Thus, what in, say, Macculloch’s *Attributes* was an ekphrastic admiration of artefactual beauty properly speaking – ‘beautiful invention’ of a Stork’s leg, ‘adopted for no other purpose than to demonstrate the resources of the Artist’ – had been transformed, with Darwin deploying only subtly reshaped rhetorical resources to think a radically distinct ontological claim.⁴⁸⁸ So, although it might be said that Darwin’s rhetoric was simply a shorthand for a certain theoretical *attitude* towards structures (an affective *energia* that sought to capture and transmit the thrill of grasping the detail of adaptations in the world as they illuminate and are illuminated by natural selection), this attitude of aesthetic interest in the adaptation had a long history in natural theological discourse. This rhetoric had long been read as mounting an ontological claim regarding the beauty it identified, not only insofar as organic form had an aesthetic purposiveness within the logic of design, but because this form also existed to attract our attention and admiration, and therefore come to know it as a designed adaptation (for instance, Chalmers’ ‘reflex revelation’). Through correspondency, our experience of beauty reflected a material rhetoric within nature itself, with God as its divine author. Where Darwin’s ‘beautiful adaptation’ had an aesthetic-cognitive role that mirrored its use in natural theology (drawing attention to the functional adaptation of living beings), pointing towards ‘beautiful adaptations everywhere and in every part of the world’ was a dangerous game.⁴⁸⁹ The same aporia of adaptive utility and purposeless purpose that so troubled natural theological aesthetics from Paley through to the morphological turn in the 1830s-50s was repeated in Darwin’s thought, and what we might understand as subtle appropriation or dialectical transformation, could very easily be read as re-inscription in the

⁴⁸⁸ *Attributes*, I, pp. 228-229.

⁴⁸⁹ *Origin*, p. 61.

period itself, especially where beauty appeared to be one of the obvious kinds of form that natural selection couldn't explain.⁴⁹⁰

Leaving, for now, this first register of beauty, I turn to the other modes of purposelessness that Darwin hedged against in his discussion of the fatal doctrine. In the previous section I outlined how Darwin offered sexual selection as an explanation for certain instances of natural beauty in *Origin*. Although, given the brevity of Darwin's treatment, there were many unresolved issues (for instance, any account of what a 'standard of beauty' entailed, and a theory of mind to go with it, were left in abeyance), the detail doesn't matter here so much as the fact that Darwin had, in principle, a distinctive teleology to explain the intrinsic aesthetic purposiveness of certain living forms.⁴⁹¹ Accordingly, sexual selection will not yet detain me. However, the alternative vehicle for the production of dysteleological form – the 'effects of variability [...] modified by various degrees of inheritance and of reversion' as well as effects 'governed by many unknown laws,' the 'correlation of growth,' the 'direct action of the conditions of life' and 'use and disuse' – will, because Darwin now faced the problem of explaining complex questions regarding the purposiveness of organic form when the two available modes of teleological explanation were either the adaptive utility of natural selection, or sexual selection.⁴⁹²

By the time of *Origin*, Darwin had developed several ways of understanding dysteleological form. For example, synchronic aspects of morphology (Owen's general homology, say), were easily explained by an evolutionary hypothesis, with Darwin confident that 'unity of type is explained by unity of descent,' and so the fact that the general body plan of beings possesses 'no direct relation to the habits of life of each species' wasn't an especial problem.⁴⁹³ However, when it came to the diachronic aspect of efficient causal mechanisms generating new form, from morphogenesis to inheritance, the picture was more complex. For Darwin, the 'free play of the various laws of growth,' could produce hereditary structures whilst remaining unconstrained by functional demands, and so resulted in form that was both a clear exception to purposiveness (monstrosity, for instance), but *also sometimes confusable*

⁴⁹⁰ Indeed, this was only a problem that intensified through the first three editions of the *Origin*, with Darwin using these locutions more and more, especially as they distinguished natural selection from non-adaptive mechanisms of transmutation. See, for instance, *Origin*, 3rd edn, pp. xiii-xix.

⁴⁹¹ *Origin*, p. 89.

⁴⁹² *Origin*, p. 43.

⁴⁹³ *Ibid.*, pp. 206 and 199.

with purposive form. In some cases there was good reason for this confusion, as even where form had an accidental function, efficient causal laws were enfolded within a teleological nexus and *made* purposive, for instance the ‘contrivance’ of ‘exquisitely constructed hooks’ that enables a ‘trailing bamboo’ to climb, but which Darwin understood to have initially ‘arisen from unknown laws of growth’ and was only ‘subsequently taken advantage of by the plant undergoing further modification and becoming a climber.’⁴⁹⁴

In the more narrow context of sexual selection, these dysteleological laws of growth produced form that had the consistency of an exception to the exception, with Darwin forced to somehow account for deviations from both natural *and* sexual selective explanations, where, for instance, referring to the bizarre secondary sexual characteristics of male animals, Darwin conceded that we cannot ‘attribute all such sexual differences to this agency [of sexual selection].’⁴⁹⁵ Cases of ‘peculiarities’ of males (e.g. the ‘horn-like protuberances in the cocks of certain fowls, &c.’) exist which we ‘cannot believe to be either useful to the males in battle, or attractive to the females.’⁴⁹⁶ These elements of structure, neither ‘useful or ornamental,’ inhabited the interstices of these opposing teleological orders as a domain of ‘monstrosity,’ or pure, meaningless exception to the rational explanation of purposive form.⁴⁹⁷ Although Darwin could, in principle, explain certain beauty or ornament that once seemed like a wholly negative exception to adaptive utility, other forms eluded even the novel explanatory framework of sexual selective purposiveness. Thinking back to Darwin’s characterisation of sexual selection relative to utility, although Darwin was clear that ‘the effects of sexual selection, when displayed in beauty to charm the females, can be called useful only in rather a forced sense,’ beauty, at least where it was a function of sexual selection, was closely allied to the ‘utilitarian doctrine’ it breached, because both beauty and function were the results of analogous processes that achieved purposiveness of form.⁴⁹⁸

In the case of ‘horn-like protuberances,’ laws of growth did not produce aesthetic form, but a further, and more damaging difficulty came when laws of growth produced forms that were perceived as beautiful and so made these two modes of dysteleology (the

⁴⁹⁴ Ibid., p. 197. Although Darwin had not yet developed a cognate framework, the link between morphogenetic law and selection would soon prove hugely important for Darwin’s understanding of aesthetic form.

⁴⁹⁵ Ibid., p. 90.

⁴⁹⁶ Ibid., p. 90.

⁴⁹⁷ Ibid., p. 90.

⁴⁹⁸ *Origin*, p. 199.

aesthetically purposive and non-purposive) confusable. Where even Darwin did not yet have a framework to make sense of these interacting teleologies, for Darwin's contemporaries the distinction between kinds of aesthetic form was doubly nebulous, with interpretative decisions regarding what kinds of beauty were intrinsically aesthetically purposive, or simply extrinsically so, acting to undermine the distinctions necessary to save Darwin's argument from natural theological aesthetics. The difficulties that Darwin's deployment of beauty in the first or second edition text of *Origin* caused an otherwise well-disposed reader, the botanist George Thwaites (1812 – 1882), are exemplary in this regard, as they were an early catalyst for Darwin's realisation that he had to offer an explicit theory of beauty, one which reframed the question of beauty by thinking how differing kinds of natural purposiveness were produced by differing teleological or causal modes (and, looking forward, their complex conjuncture). The heart of Thwaites's difficulty concerned the beauty of Diatoms [Bacillariophyceae] and other microscopic beings; some of the very examples given by Kingsley and Huxley that motivated Darwin's turn towards the teleological questions of aesthetic form. Thwaites had written to Darwin regarding certain 'simple cells,' asking 'how could mere natural selection produce such exquisite beauty & symmetry as we see in every organized structure?'⁴⁹⁹ In this case, Darwin's challenge was not explaining away forms of purposelessness as they might be encountered, but making sense of beauty when such beauty was, in general, claimed as a real purpose properly speaking, but sexual selection was no longer a viable means of naturalising it. Thwaites's difficulties with Darwin's use and discussion of beauty in *Origin* were the first traceable intervention that would one day take shape as the fourth edition's new section on the 'Utilitarian Doctrine.'⁵⁰⁰

Darwin had responded pointedly to Thwaites' question by ridiculing the position of intentional aesthetic design, writing 'do you really suppose that for instance Diatomaceæ were created beautiful that man after millions of generations sh^d. admire them through the microscope?'⁵⁰¹ Yet, by Darwin's own account of natural and sexual selection, such beauty seemed inexplicable, and Darwin, having never denied that all such form *was truly beautiful*, could not elude the charge by making this particular ascription of beauty purely subjective. Faced with an apparent impasse, Darwin's solution was to abandon the idea that all beauty

⁴⁹⁹ 'Letter from G. H. K. Thwaites, 14th February 1860,' *Correspondence*, VIII.

⁵⁰⁰ *Origin*, 4th edn, p. 239.

⁵⁰¹ 'Letter to G. H. K. Thwaites, 21st March 1860,' *Correspondence*, VIII.

had the same teleological characteristics (a mode of intrinsic purposiveness), so, although ascriptions of beauty still picked up on some real formal aspect of structure in the world, it was in many instances – at least relative to the logic of sexual selection and CROE – an extrinsic ascription of beauty to form. Taking Diatomaceæ as illustrative of this new argument, Darwin offered a run through of the key teleological challenges biological form offered and could be resolved by, including the crucial addition of a causal mechanism that provided a dysteleological explanation for beauty by which we mistook ‘repetition’ of form as real aesthetic purposiveness:

I sh^d attribute most of such structures to quite unknown laws of growth; & mere repetition of parts is to our eyes one main element of beauty. When any structure is of use (& I can show what curiously minute particulars are often of *highest* use) I can see with my prejudiced eyes no limit to the perfection of the coadaptations which could be effected by natural selection.⁵⁰²

Although gesturing towards ‘unknown laws of growth’ might appear as an explanatory cop out, where Darwin made reference to an ateleological domain of laws producing ‘mere repetition of parts,’ even this simple gesture represented a decisive modification of Darwin’s account of aesthetic purposiveness, with Darwin attempting to understand certain kinds of beauty as the result of the conjunction between our aesthetic faculty (as yet unexplained) and a process of efficient causal law that produces form only contingently linked to the faculty that finds them beautiful. If judgements of aesthetic pleasure and ontological judgements had been coterminous, there was now a space of separation between them, one founded – tellingly – on the distinction between the teleological characteristics of the causes that produced such form.

For Darwin, this novel understanding of certain instances of beauty was interesting enough to prompt him to make further manuscript notes on ‘Thwaites object[ion] about the beauty of Diatomaceæ,’ rephrasing his solution to Thwaite’s claim with the addition of the idea of symmetry – that ‘mere symmetrical repetition is to us one main element of beauty & that [represents] no difficulty,’ with ‘repetition mere repetition.’⁵⁰³ Although Darwin offered no reason for *why* we find symmetry or repetition of form beautiful, this level of detail didn’t greatly matter when Darwin’s aim was to resolve the major teleological problem of any

⁵⁰² Ibid.

⁵⁰³ CUL-DAR48.A42r.

perceived beauty exhibited by organic form being recuperated by natural theological aesthetics. In the instance of the silica shells of Diatoms, a causal process only contingently related to human aesthetic faculties created a formal feature that materialises regularity as ‘mere repetition’ simply because it was lawfully regular, and where we are predisposed to be fascinated by or attracted to such regularity, we ascribe beauty *and therefore a mistaken purposiveness* to such form. Accordingly, beauty was not just the question of the ontological status of the relationship between the mind and its proper aesthetic object (as CROE), but how a faculty developed to find certain forms beautiful (the ‘standard of taste’ of sexual selection and the intrinsic aesthetic purposiveness it produced) could subsequently read off extrinsic objects in those terms. Although the details of this kind of argument would only be worked out by Darwin through the 1860s, where sexual selection and the development of taste implied the coevolution of an ‘æsthetic faculty’ *with* its proper objects (and so had the form of CROE), these other cases represented instances where there was a commandeering of form in terms of beauty that had no real aesthetic purposiveness.⁵⁰⁴ In coming to answer the concrete problem of what specific forms counted as a real aesthetic purposiveness in the world (the form of microalgae, compared, to say, an Argus pheasant), Darwin finally began to make an explicit stratification of kinds of causes of aesthetic form, providing a classification of different kinds of beauty on that basis.

Where Darwin’s discussion implicated the dynamics of judgement or hypallage regarding an extrinsically beautiful object (i.e. we externalise the mental property of beauty by mistaking it as inherent to the object), the further interest of Darwin’s response to Thwaites was that by broaching the style used to describe or cognise function, Darwin returned to the originary problem of how aesthetic categories were used to understand natural selection. Darwin expressly recognised how his rhetorical posture not only supported his scientific interests, but was circularly constructed by them, viewing, as he put it to Thwaites, with avowedly ‘prejudiced eyes’ the ‘perfection of [...] coadaptations,’ and so reinscribing a subjective-affective cognition of adaptation as the explanatory vehicle of natural selection.⁵⁰⁵ Yet, this same aesthetically interested judgement regarding form was marshalled to cognise organic teleology naturalistically, and so simultaneously eschewed the

⁵⁰⁴ *Descent*, I, p. 64.

⁵⁰⁵ ‘Letter to Thwaites, 21st March 1860.’

reality of our affective engagement with many natural forms as the registration of ‘mere symmetrical repetition.’ Darwin was trying to have it both ways, and the overarching problem in this case was not that there was a difference between these modes of understanding aesthetic attributes (as Darwin was clear enough that they represented two ontologically distinctive kinds of beauty), but how one could felicitously distinguish between the two. How did one know that certain form *was truly purposive* – either aesthetically purposive for us or functionally purposive for the adaptive utility of a being – or was just apparently purposive because it had formal features that elicited the projection of an extrinsic judgement regarding its beauty?

Privately, Darwin had a growing sense that this aesthetic dysteleology might speak to the very selective logic it was confused with, and thereby directly impinge on the teleology of design. So, for instance, in a letter to Frances Julia Wedgwood, Darwin invoked his favoured example of the woodpecker as a way of reemphasising the central claims of *Origin* against special creation, claiming that as humans select chance adaptations as they arise (not *designed* variations) during the process of artificial selection, ‘I can see no reason why [we] should rank the accumulated variations by which the beautifully adapted woodpecker has been formed, as providentially designed.’⁵⁰⁶ As Darwin phrased it, was the ‘rock-pigeon’ really subject to a predetermined variability of form such that it could be selected to become a ‘pouter or fantail’?⁵⁰⁷ Where such ‘variations are accidental, as far as purpose is concerned (of course not accidental as to their cause or origin)’ and therefore have no link to finality of any mode, they instead index an efficient causal order generating variations that subsequently become available to selective teleology.⁵⁰⁸ Accidental beauty might *become* genuine purposiveness.

So, a shift was already taking place in Darwin’s thought, as to even make this argument Darwin was now trading on beauty’s teleological ambivalence, with the claim to ‘providentially designed’ ‘beneficial variations’ in the case of adaptive utility running up against the purposelessness of aesthetic selective criteria. An appeal to designed variation as the ultimate source of the utility of adaptation recapitulates the same problem as the fatal doctrine of aesthetic design, because aesthetically available variations would have to be

⁵⁰⁶ ‘Letter to F.J. Wedgwood 11th July 1861,’ *Correspondence*, ix.

⁵⁰⁷ *Ibid.*

⁵⁰⁸ *Ibid.*

produced in the same way, and therefore to no end but being ‘providentially designed for man’s amusement.’⁵⁰⁹ Given the role this argument would one day have in *Variation* (1868), letters such as this take on considerable importance in showing how Darwin was using beauty as a way of thinking through developing questions of organic teleology and dysteleology more generally. Darwin’s theory – as it had in his dialogue with Thwaites – pointed towards the conjuncture of multiple teleological modes in the production of any effect (the interplay between morphogenetic law, thought as chance, and selection), a complexity that Darwin had himself not yet worked out in detail. Beauty became a hedge against providence, not manifest evidence of its operation, with real aesthetic purposiveness now partially the result of a process that had no reference to any *telos* at all.

However, despite these provisos, and despite Darwin’s local theoretical sophistication in positing biological form as the causal product of differing teleological modes, in general Darwin still kept deploying the same old aesthetic *topoi* of natural theology with very little concession to the misunderstandings they fostered, and the reception of *Orchids* (1862) was emblematic of the problems Darwin consequently faced. In a letter to his publisher, John Murray, Darwin had described the proposed project as a work of ‘facts [...] collected during twenty years’ that ‘strike me as curious,’ with these ‘curious facts’ arranged ‘like a Bridgewater [sic.] Treatise’, ‘the chief object’ of which was ‘to show the perfection of the many contrivances in Orchids.’⁵¹⁰ As Darwin similarly wrote in the introduction to *Orchids*, this was a work expressly founded upon the consideration of ‘contrivances [...] as varied and almost as perfect as any of the most beautiful adaptations in the animal kingdom.’⁵¹¹ Clearly, where Darwin’s first monograph succeeding the exposition of natural selection in *Origin* took explicit inspiration from generic form of natural theological texts, and made ‘beautiful adaptations’ and ‘contrivances’ its central motivation, this strategy was fraught with danger. Rather perspicaciously (going on Darwin’s admission to Murray), an anonymous reviewer in the *London Review* even felt able to claim of *Orchids* that ‘the whole series of the Bridgewater Treatises will not afford so striking a set of arguments in favour of natural theology as those which he has here displayed.’⁵¹²

⁵⁰⁹ Ibid.

⁵¹⁰ ‘Letter to John Murray, 21st September 1861,’ *Correspondence*, ix.

⁵¹¹ *Orchids*, p.1.

⁵¹² ‘Review of “Orchids,”’ *London Review*, 14th June 1862, pp. 553-554.

Although the rhetorical policy of *Orchids* was intended as a disruptive mirroring of natural theological writing (a ‘flank movement’, ‘worked under the belief of the modification of species’), the overarching theoretical construction at the heart of this ‘flank movement’ was not formulated by Darwin, but was first developed in a 1793 work of physico-theological botany by Christian Konrad Sprengel.⁵¹³ Sprengel had argued that flower morphology should be understood as teleologically purposive for fertilisation by insect vectors as it ensured cross-pollination [allogamy], and so, given that *Orchids* is quite explicitly a book about final causes in nature, and Darwin’s discussion of aesthetically inflected contrivances – ‘like a bridge-water treatise’ – was itself a direct adaptation of a work of physico-theology, it is little surprise that *Orchids* has become a *locus classicus* for discussions of teleology and natural theology in the Darwinian corpus.⁵¹⁴ Taking a recent example of such attention, in his *Age of Analogy*, Devin Griffiths has sought to trace Darwin’s discussion of the contrivance to the work of his Grandfather Erasmus Darwin, taking up the example of the ‘curious contrivance,’ which was used by Erasmus Darwin in the *Loves of Plants* to describe the pollination mechanism of the bee orchid (*Ophrys apifera*).⁵¹⁵ Such intertexts are fundamentally important in this case, given, as per Griffiths, ‘the intensive vocabulary of “contrivance” provides a key point of translation between the language of natural theology and the new imaginative regime of natural selection.’⁵¹⁶ For Griffiths, the interest of Darwin’s appropriation and use of the contrivance was that it acted to mediate between the teleology of natural theology and that of natural selection, and so *Orchids* represents a crucial text in Darwin’s formulation of a ‘flat theology’, which, ‘like agnosticism, abjures the question of a higher power’ and thereby ‘preserves a way of talking about teleology while bracketing the problem of super natural agents.’⁵¹⁷ Yet, although it might be true that Darwin was trying (in anachronistic terms) to think a self-organisational teleology using the cognitive resources of natural theology, the key interest of *Orchids* as I understand it is neither the relationship of Darwin’s language of contrivance to Erasmus Darwin, nor any retrospective diagnosis of Darwin’s philosophical

⁵¹³ ‘Letter to Asa Gray, 23-4th July 1862,’ *Correspondence*, x; Christian Konrad Sprengel, *Das Entdeckte Geheimniss der Natur im Bau und in der Befruchtung der Blumen* (Berlin: Vieweg, 1793).

⁵¹⁴ See, among others, Griffiths, *The Age of Analogy* (Baltimore: Johns Hopkins University Press, 2016), pp. 211-258; Thierry Hoquet ‘Darwin, Teleologist? Design in the *Orchids*’, *Comptes Rendus Biologies*, 333 (2010), 119-28; Beatty, ‘Chance Variation.’

⁵¹⁵ Griffiths, p. 245.

⁵¹⁶ *Ibid.*, p. 245.

⁵¹⁷ *Ibid.*, p. 252.

success. The important point – however mundane – remains that many of Darwin's contemporaries did not follow his logic in any of its rhetorical or theoretical intricacy, but, utilising CROE as the schema by which issues of beauty and teleology were understood, read and criticised Darwin on that basis.

In this sense, the history of the reception of *Orchids* is just as telling as anything Darwin actually wrote in the work itself. As Bernard Lightman has explored, certain natural theological figures 'seized upon the traces of design embedded in Darwin's theory,' and beauty was no exception, representing, for the reasons I have discussed, one of the most obvious hand holds by which to grasp the theological implication of the Darwinian theory.⁵¹⁸ Certainly, the first impulse of many contemporary reviewers of *Orchids* was to position Darwin relative to the aesthetic concerns of natural theological discourse, and, as Asa Gray's review in the *American Journal of Science* made clear, Darwin's focus on 'truly exquisite' 'adaptations' and 'contrivances' could be thought almost synonymously with the aesthetic-teleological nexus of natural theology:

'Adaptations' – many of them truly exquisite – and 'contrivances' they may well be termed, being obviously as evincive of design as are analogous arrangements in the animal kingdom, from which intention is so irresistibly inferred. Indeed, had Mr. Darwin begun with this little book, and kept back a few theoretical inferences, it would have been a treasury of new illustrations for the natural theologians, and its author, perhaps rather canonised than anathematised, even by many of those whom his treatise on the origin of species so seriously alarmed.⁵¹⁹

Darwin's *Orchids* rehearsed the argument from design *in nuce*, with the same adaptations that were the explanatory foundation of natural selection themselves 'obviously [...] evincive of design.' Thus, for Gray, the truth of *both* natural selection and natural theological argument could be discovered in the aesthetically predicated contrivance or adaptation. Where the same forms underpin both hypotheses, Darwin's general method of evidencing underdetermined our choice of theory whilst leaving open the possibility that our affect or aesthetic attitude towards such structure was itself purposive (and so returns us to the epistemic correspondency of design). The gaze of the scientist was as much evaluative as

⁵¹⁸ Bernard Lightman, *Victorian Popularisers of Science* (Chicago: University of Chicago Press, 2007), p. 42.

⁵¹⁹ Asa Gray, [Review of *Orchids*], *American Journal of Science and Arts*, 34 (1862), 138-144 (p.140).

epistemic, aiming at 'admirable' or 'exquisite' contrivances for their aesthetic as much as morphological interest. Given this common aestheticisation of form, it was easy to read Darwin's theory as manifesting the same ontological claim as an orthodox version of CROE, and so, for all the growing sophistication of Darwin's multiple teleologies and the discussion of differing modes of purposiveness, the calculated ambiguity of Darwin's formulation and use of beauty acted to cloud understanding, with claims to functional beauty read as the traditional Paleyan 'beautiful contrivance.' The stage was set for the Duke of Argyll to read the *Orchids* as a work of physico-theology despite itself.

Chapter IV

The Argyll Dispute

In Outline

It was the late summer of 1862, and Joseph Dalton Hooker, Darwin's closest confidant, was holidaying at Inveraray, home to the ancestral seat of the Dukes of Argyll. Whilst there he met with the incumbent Duke, George Campbell, on several occasions, and evidently conversation turned to scientific matters. In the May of that year Darwin had published the *Orchids*, and Hooker wrote to Darwin that Argyll had been 'pottering over the Orchid book.'⁵²⁰ However, Hooker was sceptical regarding Argyll's understanding, appending the fatal proviso that such 'pottering' remained 'to small purpose.'⁵²¹ Yet events to follow rather belied Hooker's initial assessment, and in October 1862 an article entitled 'The Supernatural' appeared in *The Edinburgh Review*, which, whilst ostensibly concerned with sundry natural theological works, dedicated a considerable portion of its length to formulating a critical response to *Orchids*.⁵²² It was the first move in an intellectual struggle that would have transformative effects on Darwin's writing, especially on the terrain of beauty; in 1864 Argyll would renew his attack on Darwin, and Darwin was goaded into a response.⁵²³

Darwin's public response would come via the 1866 publication of the fourth edition text of *Origin*, with some of Darwin's most substantial additions – a new section on the 'Utilitarian Doctrine' – intended to rebut (albeit anonymously) the further critique made by Argyll in 1864.⁵²⁴ However, these were problems that a new edition of *Origin* alone couldn't solve, and in riposte Argyll would publish his *Reign of Law* (1867), a book length work of natural theological apologetics that gathered together and expanded upon his previous

⁵²⁰ 'Letter from J.D Hooker, 16th September 1862,' *Correspondence*, x.

⁵²¹ Ibid.

⁵²² George Campbell, 'The Supernatural,' *The Edinburgh Review*, 116 (1862), pp. 378-397.

⁵²³ In his capacity as president of the Royal Society of Edinburgh, Argyll had dedicated the opening address of the 1864-65 session to a critique of Darwinian theory. For the published version of this text see Argyll, '[Opening Address] Monday, 5th December 1864' in *The Proceedings of the Royal Society of Edinburgh*, vol 5 (1862-6) (Edinburgh: Neil and Co., 1866), pp 264-292.

⁵²⁴ See *Origin*, pp. 237-243.

criticisms of Darwin, with new material and examples directly mirroring Darwin's own additions in the latest text of *Origin*. From this moment forward Darwin publicly acknowledged Argyll's criticisms, and Darwin's next major works, *Variation* (1868) and *Descent* (1871) would, to varying degrees, respond once more to these challenges, tackling the outstanding teleological and aesthetic problems of organic form. Among the key examples deployed by Darwin in pursuit of this expansive theory of beauty in *Descent* were those first offered by Argyll and their mutual source the ornithologist John Gould. The 'mere ornament' and 'mere variety' of hummingbirds or the Argus pheasant – prized by Argyll as 'an end and aim in the workshop of Nature as [...] in the workshop of the goldsmith and the jeweller' – now became fundamental coordinates in Darwin's aesthetics.⁵²⁵ Only in the 1874 edition of *Descent* would Darwin start to remove references to Argyll, ameliorating the antagonistic tone that had characterised some of his engagements with Argyll in the first.⁵²⁶ It seemed, at long last, that Argyll, or the natural theological critique he represented, was no longer worth worrying about.

The Argyll dispute has attracted a considerable degree of historical attention, but, in part because it has become emblematic as one of the defining intellectual and cultural trials of Darwin's career, the details of Argyll's critique and Darwin's response have been somewhat occluded, especially during the middle years of the 1860s.⁵²⁷ Despite recognising that foundational aspects of Darwin's theory of beauty were implicated in the Argyll dispute, historians have generally focussed on its latter stages, particularly the window of time between Argyll's *Reign of Law* (1867) and Darwin's *Descent* (1871).⁵²⁸ However, my aim in this chapter is to reread the trajectory of the earlier years of this episode (from 1862-68), recovering the details necessary to reconstruct the relationship of Darwin's thought to natural theological aesthetic theory, and how Darwin and his contemporaries understood this link. I will argue that both Argyll's critique and Darwin's theory emerged from the common terms of CROE, forcing Darwin to reorient his understanding of natural teleology more generally, with one major breakthrough in this process – the appearance of Darwin's first public account

⁵²⁵ *Reign of Law*, p. 200.

⁵²⁶ Compare, for instance, *Descent*, II, p. 230 with *Descent* [2nd edn], pp. 493-4.

⁵²⁷ For general accounts bearing on sexual selection or aesthetic questions see Evelleen Richards pp. 384 and 391-3; Smith, pp. 98-99; Voss, pp. 160-174.

⁵²⁸ For instance, Johnathan Smith's account of Darwin's 'appropriation' of the arguments of Argyll (and Gould), where 'aggressive statements of beauty of beauty's sake [...] were gleefully endorsed by Darwin and put to his own uses' (Smith, p. 123).

of beauty in 1866 – occurring before the *Reign of Law* ever appeared. During this chapter, I provide an account of the Argyll dispute and its effects on Darwin's writing from 1862-1868, exploring, through an analysis of notes, letters and published works, how Darwin came to develop his mature aesthetic theory. I will introduce the innovations of Darwin's theory successively, retracing the cumulative structure of Darwin's aesthetics as he developed it in response to Argyll, eventually positing a complex teleology that constellated the distinctive causal orders of sexual selection, morphogenetic dysteleology, and a hereditary account of mind and taste founded in the theory of pangenesis. The fundamental teleological architecture of Darwin's theory of beauty and the 'aesthetic faculty' was largely sketched out by 1868.⁵²⁹

Of all the specific controversies occasioned by Darwin's work – Owen, Mivart and Butler, to name some of the more notable antagonists – none were, at least publicly, more good natured than Darwin's protracted skirmish with Argyll.⁵³⁰ Indeed, in *Variation* Darwin disguised his quarrel with Argyll through a magnanimous claim to agreement concerning the 'admirably coordinated' structure of organisms that marked their outward form as one of harmonious functional integration.⁵³¹ Cuvierian clichés aside, in private the tone was far less noble. Initially Darwin and his friends had treated Argyll's criticisms of 1862 with the levity that characterised Hooker's first mention of Argyll's interest, mocking his engagement with *Orchids* as 'a good joke' and questioning his basic understanding of natural selection.⁵³² However, Argyll renewed and extended his criticisms on several occasions, and by the publication of *Reign of Law* (1867), tempers had frayed. Darwin's son William wrote of the work that it was 'the most illogical stupid twaddle I ever read,' and Hooker read the *Reign of Law* the following year with 'utter disgust—& uncontrollable indignation,' damning Argyll with the 'fatal facility for handling things he does not fully understand.'⁵³³

Yet, for all his annoyance Hooker still managed to look to the funny side of Argyll's argument, directing particular attention to what he saw as symptomatic of the arbitrariness of natural theological reasoning, especially as it had taken up the perspective of

⁵²⁹ *Descent*, I, p. 64.

⁵³⁰ For discussion of some of the other disputes Darwin's work was embroiled in, see Gowan Dawson, *Darwin, Literature and Victorian Respectability* (Cambridge: Cambridge University Press, 2007).

⁵³¹ *Variation*, II, p. 319.

⁵³² 'Letter to J. D. Hooker [10–]12 November 1862,' *Correspondence*, x.

⁵³³ 'Letter from W.E Darwin, 26th March 1867,' *Correspondence*, xxiv, and 'Letter from J.D Hooker, 20th May 1868,' *Correspondence*, xvi.

transcendental anatomy: ‘the idea of God being compelled to dab in rudimentary organs to *keep up appearances!* as it were, is very dull.’⁵³⁴ Yet the same arbitrariness that rendered this mode of argumentation risible contained within it the germ of a serious philosophical issue. As I have traced, ‘keeping up appearances’ had become intrinsic to natural theological design, with the compositional unity of beings – itself apparently lacking rational justification or purpose – increasingly prized as direct evidence of design. Where the common dysteleology of unity of plan and the purposive without purpose had shifted natural theology towards an aesthetic understanding of organic form, Hooker simply read off in a comic modality the logic that was so central to natural theological approaches to both beauty and comparative morphology. From the perspective of a convinced transmutationist, the design argument now had the consistency of a joke.

It is crucial to grasp, however, that Argyll’s initial critique of Darwin was carefully aimed at the *same* points of philosophical vulnerability (on both theoretical and stylistic registers) in Darwin’s early public formulation of natural selection, and the same fragility that Argyll’s argument exhibited in the latent comedy of redundancy would become the weapon he wielded to criticise Darwin’s theory. Thus, to Argyll, where Darwin’s theory was founded upon the explanatory supremacy of adaptive utility, it seemed particularly vulnerable to an aesthetic dysteleology that bore no straightforward relationship to the ‘struggle for life.’ Darwin no longer had God to ‘dab in’ these other forms. That the Argyll dispute in some way problematised the teleology of natural selection is common knowledge of sorts, captured in its broadest outline by Desmond and Moore that ‘for many contemporaries it demolished Darwin’s crude view of nature’s utility.’⁵³⁵ Whatever the sophistication of Darwin’s argument, in the early editions of *Origin* Darwin had offered only laconic asides regarding the fraught relationship between beauty and utility, and in this sense Argyll’s critique originated in a pardonable error. Argyll failed (perhaps deliberately) to quite grasp what Darwin had intended by proposing sexual selection, as well as reading past Darwin’s attempts to make sense of how other modes of apparent purposelessness were produced in organic form.⁵³⁶ However, as hopefully clear by now, any critique mounted by Argyll on the grounds of utility

⁵³⁴ Ibid.

⁵³⁵ Adrian Desmond and James Moore, *Darwin* (London: Penguin, 1992), pp. 527-8. For continuing dispute following Argyll’s *Reign of Law*, see *ibid.*, pp. 545-546.

⁵³⁶ Argyll was hardly alone in finding sexual selection less than compelling, and Alfred Russell Wallace was a notable dissenter. For discussion see Evelleen Richards, pp. 370-416.

was hardly his unique argument alone, but tapped into a half-century of intensive debate regarding the status of purposeless organic forms within design. Where, as Evelleen Richards has framed it, Argyll's argument was so 'appealing to those [...] who wanted an accommodation with natural theology,' part of Argyll's charm must have been the comfort of knowing that ancient truisms could be synthesised with the novelty of Darwinian theory.⁵³⁷

Thus, I shall explore how Argyll's (mis)reading is revealing on two counts. Firstly, that the reception of Darwin's approach to beauty was made using the categories of contemporary natural theological theories of beauty, and secondly, that both sides of the divide were deploying similar arguments and possessed of common teleological preoccupations. In this respect, Argyll's work was not just a response to Darwin, but an instantiation of the very problem that Darwin was writing out of, with many of Darwin's contemporaries already thinking in such terms. In the previous chapter I started to work through some of the problems of beauty for Darwin's theory, and how his peers reacted to it, and this is how I feel the Argyll dispute should be framed. Argyll's project was expressly melioristic, trying to repair the sprawling concept of utility that the aporetics of functional teleology had fragmented. Throwing together venerable Paleyan themes with morphological idealism, for Argyll 'we must enlarge our ideas as to what is meant by Use in the economy of Nature' to 'include ornament' and 'include also not merely Actual Use, but Potential Use, or the capacity of being turned to use in new creations.'⁵³⁸ Assuming morphological unity as proleptic adaptation, Argyll claimed to synthesise 'Unity of Plan' with 'Variety of Function' – everything was speculatively useful within the unfolding plan of creation, however dysteleological it might appear at a given instance of time.⁵³⁹ Using this eclectic framework, Argyll's critique was able to condense fifty years of commonplaces, which, by virtue of forcing Darwin to make a response, took on the dimensions of a privileged but otherwise representative example.

Rather than simply focussing on rhetorical agonistics, I aim to show how polemical struggle revealed the pervasiveness of CROE as the hermeneutic framework by which contemporaries were apprehending Darwin's work. Indeed, where we understand the Argyll dispute as regulated by the shared terms of CROE, it becomes possible to trace how CROE itself structured Darwin's response to natural theological critique; not only furnishing the

⁵³⁷ Evelleen Richards, p. 392.

⁵³⁸ *Reign of Law*, pp. 213-14.

⁵³⁹ *Ibid.*, p. 211.

challenges that a theory of beauty would have to address, but shaping the positive form that Darwin's answers took. Where Darwin's first response to the 'fatal' critique of adaptive functionalism mounted by Huxley and Kingsley was subtle, during the Argyll dispute these latent problems became part of public debate regarding the teleological meaning of natural selection. Darwin's mature theory of beauty was, despite apparently representing a final break with natural theological argument, a theory deeply marked by the continuing fallout of the Argyll dispute. It can, I claim, be productively understood as a work *within* the intellectual tradition of natural theological aesthetics; both apotheosis and dissolution.

1862 – 1865

Argyll's opening salvo – his 1862 article 'The Supernatural' – repurposed some of the oldest tropes of physico-theology. This was not, as yet, an argument regarding beauty as autonomous purpose, but a critique of the explanatory adequacy of natural selection founded upon the functional contrivances that Darwin took as the cornerstone of his reasoning. For Argyll, Darwin's *Orchids* had demonstrated that adaptive reasoning was 'so impressed on Mr. Darwin's mind, that, in every detail of structure, however singular or obscure, he has absolute faith that in this lies the ultimate explanation.'⁵⁴⁰ Yet, the issue was not the logic of natural selection per se, but what it means for teleological reasoning to be 'impressed' on our minds, and so how natural selection might itself be rethought in terms of a recursive and epistemic design argument. If, in Argyll's words, the material instantiation of 'mental purpose and resolve is the one thing that our intelligence perceives with direct and intuitive recognition,' apparent purposiveness of form could be claimed to be both more legible and more certain than any precise account of the secondary law that realised such form.⁵⁴¹ The argument of Chalmers's *Bridgewater* had been rehashed, and where Darwin, as much as Paley and his epigones, was always bound to think in terms of 'the idea of special use, as the final end and controlling principle of construction,' Argyll could leverage Darwin's habit of investing adaptation with aesthetic value against him.⁵⁴²

⁵⁴⁰ 'The Supernatural,' p. 393.

⁵⁴¹ Ibid., p. 391.

⁵⁴² Ibid., p. 393.

So, as for generations of natural theologians before him (whether Boyle, or Kames, or Whewell), for Argyll, our epistemic capacity to decode phenomena was grounded in teleological categories that mirrored the ‘superhuman’ power that created them.⁵⁴³ The correlation of our innate teleological reasoning with the vestiges of design must itself be a product of this power, and so the perception of purposiveness in nature does not so much impose its categories upon the world as discover itself in externalised form. This gesture towards an epistemic harmony of design, itself reflective of a general harmony of design (correspondency), would be rebaptised by Argyll in his *Reign of Law* as the ‘principle of Adjustment.’⁵⁴⁴ It was in the shadow of this circular representation of teleology as the foundation of scientific knowledge that Argyll confronted the key ambivalence of Darwin’s formulation of natural selection. Where Darwin needed adaptation and contrivance to think natural selection, the presumption that legitimated Argyll’s reading of the *Orchids* through and against a collection of natural theological treatises was that, on an epistemic register, there was ‘perhaps no [other] illustration so striking of this principle [that is, of correspondency or adjustment]’ than Darwin’s method of argument in the *Orchids* itself.⁵⁴⁵ Argyll exalted in the paradox:

It is curious to observe the language which this most advanced disciple of pure naturalism instinctively uses when he has to describe the complicated structure of this curious order of plants. [...] [Darwin] exhausts every form of words and of illustration by which intention or mental purpose can be described “Contrivance” – “Curious contrivance” – “beautiful contrivance,” – these are expressions which recur over and over again.⁵⁴⁶

Even the ‘most advanced disciple of pure naturalism’ could not escape the intuitive constitution of the mind, and the intuitive constitution of the mind was to be fascinated by the ‘beautiful contrivance’ that immediately signalled its maker. For the natural theological apologist, the very fact that Darwin reached for these common tropes to make natural selection intelligible signalled that contrivance was a necessary component of an ordered structure of cognition that was itself a contrivance. Natural selection had nothing to say about

⁵⁴³ Ibid., p. 395.

⁵⁴⁴ See *Reign of Law*, pp. 81-85.

⁵⁴⁵ ‘The Supernatural,’ p. 391.

⁵⁴⁶ Ibid., p. 392.

this experience of beauty, and so Darwinian theory always pointed towards design even in a misrecognised form.

Thus, unbeknownst to Argyll, he correctly identified the rhetorical strategy that Darwin had consciously employed in the *Orchids*. Yet, what Darwin jokingly referred to as a “flank movement” on the enemy’ had been taken up by the very natural theological critics it was aimed at confounding.⁵⁴⁷ Indeed, Argyll’s critique of Darwin’s vocabulary of contrivance and design was even noted by Darwin’s allies. For example, Wallace picked out the same passage as it was later included in Argyll’s *Reign of Law* as exemplary of the vulnerabilities of Darwin’s exposition of natural selection. For Wallace, the language of the ‘beautiful contrivance’ gave unnecessary succour to both unwitting misinterpreters and direct opponents of natural selection, and that (understanding ‘metaphor’ here to mean figurative language more generally) Darwin had ‘laid himself open to much misconception, and has given to his opponents a powerful weapon against himself, by his continual use of metaphor in describing the wonderful co-adaptations of organic beings.’⁵⁴⁸ As I have explored at length, within the paradigm of natural theology ascriptions of beauty were understood as representing an ontological claim, recuperating otherwise purposeless organic form as being aesthetically purposive (offering both pleasure and knowledge). Like Miller’s conceptualisation of the variation of species as style, many natural theologians had come to understand the world as a materialised rhetoric of the divine, and Argyll had now made this same claim central to his critique of Darwin. Apparently rhetorical problems (the ‘beautiful adaptation’) represented philosophically substantive problems.

What, then, of beauty as its own end? Although Argyll’s 1862 critique was mostly concerned with functional adaptation, it began to include elements of the account of natural beauty that would form the centrepiece of his 1864 address. In ‘The Supernatural’ the specific question of beauty was framed with relation to the mathematical ideas instantiated by natural forms, and how abstract unity of plan indexed an intention of design. In line with *Orchids*, Argyll’s example was the morphology of plants, considered from a transcendental perspective as the transformations and ‘expressions of a numerical idea, as so many other

⁵⁴⁷ ‘Letter to Asa Gray, 23rd-24th July 1862,’ *Correspondence*, x.

⁵⁴⁸ Alfred Russel Wallace, *Contributions to the Theory of Natural Selection*, 2nd edn (London: Macmillan and co., 1871), pp. 269-270. See also Wallace, ‘Creation by Law,’ *The Quarterly Journal of Science*, 4 (1867), 471-488.

things – perhaps as all things – of beauty are.’⁵⁴⁹ Following Darwin’s model in *Orchids*, the general homology of orchid structure was claimed as the ‘primordial or archetypal arrangement of Threes within Threes, out of which all the strange and marvellous forms of the Orchids have been developed.’⁵⁵⁰ Yet, like Whewell’s mathematically framed aesthetic structuralism in the *Plurality*, Argyll read this mathematical homology as reflecting an aesthetic architectonic of design. Material forms as they were encountered were either utilitarian or aesthetic variations upon a basic mathematical idea or archetype, ‘developed into so many various forms of beauty and made to subserve so many curious and ingenious designs.’⁵⁵¹ Utility and beauty were ways of adapting a single form, that, prior to any purpose, was the condition of possibility of any determinate end.

Darwin had pre-emptively stated this criticism in his *Orchids* (making explicit the ontological analogy with *technē* that underpinned these claims) as the belief that ‘numberless structures have been created for the sake of mere variety and beauty,—much as a workman would make a set of different patterns.’⁵⁵² However, Darwin’s dysteleological explanation for the production of varieties without discernible utility remained only partially formulated, admitting that ‘such details could only be vaguely accounted for by the direct action of the conditions of life, or the mysterious laws of correlation of growth.’⁵⁵³ So, although Argyll was leveraging the commonplaces of design (the morphological dynamics of unity and variety), these were commonplaces that Darwin did not yet have good ways of responding to. Darwin’s correspondence with Thwaites in 1860 has already revealed how he was concerned by the question of mathematical or morphological regularity as source of aesthetic pleasure, and Argyll’s Whewellian gloss on flower morphology spoke directly to this pre-existing difficulty. Although it was in no way Argyll’s unique argument, the idea that beauty was an intrinsic purpose of design became central to his critique of Darwin, because Darwin still lacked resources to convincingly naturalise perceived aesthetic form.

Wherever Darwin discussed beauty (either substantively or as the predicate of adaptation), this beauty was understood by Argyll as manifesting an ontological claim, whether in the object itself, or in its relationship to the human or divine mind. In its most

⁵⁴⁹ ‘The Supernatural,’ p. 394.

⁵⁵⁰ Ibid. See, for instance, *Orchids*, pp. 289–307.

⁵⁵¹ ‘The Supernatural,’ p. 394.

⁵⁵² *Orchids*, p. 352.

⁵⁵³ Ibid., p. 352.

general form, Argyll expressed his aesthetic critique of Darwin in the conceit that over against the utilitarian structures explained by natural selection, ‘love of beauty is equally a Purpose which we see fulfilled in Nature.’⁵⁵⁴ In the 1864 address, Argyll’s principal example of this was taken from John Gould’s *Monograph of the Trochilidae* (1849-61), which claimed that hummingbirds were otherwise purposeless forms in nature that could only be accounted for through the aesthetic motivation of design.⁵⁵⁵ Famously, Gould had exhibited a taxidermic display of his hummingbird collection at the 1851 Great Exhibition, in so doing treating a whole class of natural beings as decorative objects.⁵⁵⁶ For Gould, this display was reflective of an underlying ontological claim: we did not just find hummingbirds beautiful, but they were created for the sake of beauty or ornament as a distinct *telos*. As Gould wrote of the *Trochilidae* – ‘plumage fantastically decorated’ – their ‘gorgeous colouring [...] has been given for the mere purpose of ornament, and for no other purpose of special adaptation in their mode of life;’ the only way to make sense of hummingbirds was that ‘ornament and beauty merely as such was the end proposed.’⁵⁵⁷ Against both Cuvierian and Darwinian functionalism, ‘special adaptation’ or ‘mode of life’ couldn’t rationalise aesthetic form. The world teemed with beauty beyond any utilitarian meaning.

In the 1864 address, this same litotic sleight of hand (‘merely as such’) was utilised by Argyll, who couched the claim of aesthetic design with reference to ‘mere ornament and variety of form, and these for their own sake,’ as ‘the only principle of rule with reference to which Creative Power seems to have worked in these wonderful and beautiful birds.’⁵⁵⁸ The unhinging of adaptive rationality in the form of hummingbirds became the ultimate example of a purposeless design for its ‘own sake,’ representing a ‘development, for which, in extend and variety there is no parallel in the world, of structures designed for mere ornament, and entirely separate from any other known or conceivable use.’⁵⁵⁹ Mirroring our own *technē*, where ‘mere beauty and mere variety, for their own sake, are objects which we ourselves seek when we can make the forces of nature subordinate to the attainment of them,’ the aesthetic impulse within design exulted in its power to produce beauty simply because it was

⁵⁵⁴ [Opening Address], p. 290.

⁵⁵⁵ See John Gould, *Monograph of the Trochilidae*, 5 vols (London: Taylor and Francis, 1849-1861) and *Introduction to the Trochilidae* (London: Taylor and Francis, 1861).

⁵⁵⁶ See Voss, pp. 153-6. For Gould’s relationship to Darwin, see Smith, pp. 92-125.

⁵⁵⁷ *Introduction to Trochilidae*, p. 18.

⁵⁵⁸ [Opening Address], p. 282.

⁵⁵⁹ [Opening Address], p. 277.

possible.⁵⁶⁰ Scaled appropriately to the imagined attributes of a deity ('the superhuman'), divine omnipotence became the power to realise a universal aesthetic rationality of design. Those aspects of organic form that had once been used to attack Paleyan functionalism (by, say, Huxley), were now prized as a way of defending the legacy of Paleyan argument by characterising natural selection as a short-sighted theory of utility. Argyll even quoted back Darwin's passage on the fatal doctrine from *Origin*, noting that it was only 'fatal to his theory' because 'it gives no account at all' of beauty.⁵⁶¹ 'Mere advantage, in Mr. Darwin's sense,' would no longer do.⁵⁶²

Whatever the flaws of this kind of argument, and however much it ignored Darwin's proposal of sexual selection, the attack mounted by Argyll in 1864 represented enough of a challenge that Darwin would begin writing manuscript materials in preparation for a statement of his theory of beauty.⁵⁶³ The first of these notes was written shortly after Argyll's address and set out the general architecture of how Darwin would later frame his public theory of beauty. Given that Darwin's initial note in response to Argyll condenses so much within a short space, I reproduce it here in full, offering commentary as a way of trying to reconstruct Darwin's logic:

Dec. 1864. D. of Argyll has advanced beauty — Humming Birds — does not say males alone— How complex beauty is — geometrical drawing circles intersecting — diamonds within diamonds. Now laws of symmetrical growth will give this Kind of beauty— What more glorious object in universe than the firmament with its stars in clear frosty night.— Was this created for man,—he who thinks so may argue that many animals which existed before man appeared were created beautiful for his Eyes—
[Beauty]. No arguments advanced to show this is End.⁵⁶⁴

The immediate and mundane problem with Argyll's account of beauty as it criticised Darwin was that it simply ignored what empirically available evidence there was regarding naturalistic explanations of beauty. Argyll gave no account of the sexual dimorphism that characterised the beauty of hummingbirds (a pattern of difference that itself had to be explained to understand beauty). Darwin was not questioning that hummingbirds truly were beautiful, but

⁵⁶⁰ Ibid., p. 283.

⁵⁶¹ Ibid., p. 276.

⁵⁶² Ibid., p. 281.

⁵⁶³ See CUL-DAR47.20-22v.

⁵⁶⁴ CUL-DAR47.20.

positing that males were *more* beautiful, and so there must be some reason for this difference, not just a blanket (non)explanation that God made hummingbirds generically beautiful. The solution, at least as Darwin saw it, was that females must be selecting males for their beauty, and so there was a compelling reason for the differential beauty of male form. Crucially, in sexual selection the judgement of taste produces form, and so it made sense to think of this kind of aesthetic form as possessing an intrinsic aesthetic purposiveness (at least for the animal selecting it). Sexual selection produced form that had the same kind of ontological status as the beautiful object in CROE (its reality was defined by a relational structure comprehending both object and subject within it), but also enabled Darwin to elude the natural theological critique that such form was ‘created for man.’ Animals could be intrinsically beautiful, but also not *for us*.

Yet, the status of the correlation between the subject and object was different in many other kinds of beauty, and having dealt with this basic principle, Darwin returned to the more difficult issues that he had begun to work through in his correspondence with Thwaites regarding the form of Diatoms. Firstly, Darwin questioned what formal features constitute beauty as we (and other animals) perceive it. Beauty was, as Darwin put it, ‘complex,’ with no link to sexual selection in most cases. Where, for instance, it was tied to geometrical patterns and the ‘laws of symmetrical growth’ that produce form, beauty was the product of an efficient (morphogenetic) causal process that had only a contingent relationship to taste. Hence Darwin’s second difficulty, because beauty was not, in these instances, anything other than an extrinsic determination we made regarding form. Despite Darwin having discussed beauty in blanket terms, beauty generally implied only a contingent relationship between subject and object, with beauty entailing no ontological claim regarding its reality, either in the object, or in our relationship to it. Considered in this way, the beauty of the diatom was homologous to the beauty of other natural objects that we perceive as beautiful, as they implicate no intentional structure in their genesis as beautiful. The ‘firmament’ was not, *as an object*, underpinned by the teleological scaffold of beauty coproduced between object and subject as, for example, a hummingbird was. Stars and the form of diatoms had features that were beautiful, but only because a perceptive (aesthetic) subject made an an extrinsic judgement regarding their form. Both lacked the *sine qua non* of beauty as an ontological claim.

Although this left unexplained the evolution of the faculty by which we offer an extrinsic aesthetic judgement, the importance of this formulation was that it circumscribed our relationship to the greater sum of beautiful forms we encountered in nature, and so hedged Darwin's theory against natural theological aesthetics. In cases of the ontological reality of beauty, the beauty of the object was structurally determined by its recipient; not in the contingent sense that an audience finds it beautiful and so ascribes this property to it as a psychological act, but insofar as 'who is it *for*' represents the most essential determination of a beautiful object. Sexual selection could defuse the critique of natural theological aesthetics by appropriating its relational ontology, with a relationship to an aesthetic subject built into organic form itself. Likewise, although we could read off intrinsic aesthetic purposiveness (CROE) as beauty, it still didn't imply a necessary relationship to us or God, and so fossil beauty, the paradox that had occupied Miller during the 1840s, was resolvable without recourse to design. Darwin was as unimpressed by the claim of fossil beauty as he was regarding the claims of aesthetic design more generally, his final tag simply 'no arguments advanced to show this is End.'

As should be clear, although much of the beauty of the world couldn't be resolved in terms of an overarching anthropocentric teleology, the problem of an 'end' remained central to Darwin's theory. Tellingly, just weeks after Darwin jotted these notes, Charles Lyell wrote to Darwin regarding Argyll's critique, taking issue not with CROE, but with Argyll's deployment of CROE, observing that although he had 'no objection to the idea of beauty or variety for its own sake' Argyll 'ought also to define beauty, and tell us whether it is in reference to man or bird.'⁵⁶⁵ What mattered for Darwin's theory, at least in Lyell's eyes, was not denying the reality of beauty, but clarifying who it was for, with Darwin's contemporaries themselves interested in how he could work out the finer details of beauty as a relational property. Where natural theological approaches had generally assumed all beauty as a real end of creation indifferently, Darwin's solution was to tease out how different kinds of causal structure interacted with our (or other animal's) perception to produced distinctive kinds of aesthetic form. This process was now accelerating, with Darwin's manuscripts charting the development of a new classification of kinds of beauty as they reflected a stratification of underlying teleological meanings. So, on the 30th September 1865 Darwin was writing notes

⁵⁶⁵ 'Letter from Charles Lyell, 16th January, 1865,' *Correspondence*, XIII.

for the coming edition of *Origin*, in particular a newly expanded and separated passage on the 'Utilitarian Doctrine.' Darwin headed these notes 'Utilitarianism Nat. Selection,' and, in my interpretation, he was now concerned with some of these other explanations for aesthetic form unrelated to sexual selection, that, 'after birds and butterflies beauty [sic.],' he must make sense of the many kinds of aesthetic form that weren't resolvable in terms of sexual selective teleology.⁵⁶⁶ Darwin's initial example was certain plants, importantly *not* those (such as orchids) that had evolved to be attractive to animal pollinators, and so might have some conceivable link to their causal influence. As Darwin put this point, 'what more beautiful to man than flowers or more delightful than their odour, yet we may safely argue, from wind-fertilized [sic.].'⁵⁶⁷ In this case, our finding plants beautiful was entirely contingent relative to their formal aspects we understood as beautiful, and this first type of beauty made no real progress on the binary distinction developed above (a subjective enjoyment of form that ascribed beauty extrinsically to the causal process responsible for its beauty).

However, there were, in the case of insect-fertilised flowers, types of beauty that represented a half-way house, for instance the 'case of Viola &c that for guide to insects [sic.]' or 'perfume, for white or dusky flowers are visited by night Lepidoptera? [sic.]'⁵⁶⁸ Although both were taken as aesthetic, either visually (beauty) or through the pleasures of olfaction, neither had any intrinsic aesthetic purposiveness for us, despite possessing a real sensory purposiveness for specific animals. The recognition that certain organic form possessed a sensory purposiveness allowed Darwin to develop an account of certain instances of beauty as functional signs (biosemiosis) produced by natural selection.⁵⁶⁹ However, the same formal characteristics that made it functionally purposive (i.e., advertising nectar to ensure pollination) could be misrecognised as aesthetic purposiveness. For instance, Darwin turned to the example of seed dispersal via animal vectors: 'what more beautiful than berries of Holly, Yew or Hawthorn or Strawberries — yet of highest use we may infer, as all berries [...] which are attractive to Birds for dissemination, are bright or black & so conspicuous.'⁵⁷⁰ Utility (natural selection) had made such form 'conspicuous,' but this same real formal property

⁵⁶⁶ CUL-DAR47.21.

⁵⁶⁷ Ibid.

⁵⁶⁸ Ibid.

⁵⁶⁹ I use the term biosemiosis simply to mean that form has a functional role as a (nonlinguistic) sign in the natural world.

⁵⁷⁰ CUL-DAR47.21.

could be decoded by us as beautiful. Where the activity of animals co-constituted this form, it was thought by Darwin via a parallel to sexual selection – ‘as butterflies make each other beautiful by sexual selection, may they not give special beauty to flower when honey abounds?’⁵⁷¹ Biosemiotic form was coproduced by a real agency as it interacted with conspicuous form, and so the purposiveness we took as beautiful remained in a key sense a *real* purposiveness. The beauty of many flowers was not just geometric beauty, or the ‘stars in a clear frosty night’ that bore no relationship to some animal mind, but a product hypothecated on the existence of mind, its perceptive powers and its possible teleological agency to realise form, however accidental that selection might be relative to a purely aesthetic end. Our judgements regarding biosemiotic beauty were not *wholly* extrinsic, because where form was possessed of a genuine sensory purposiveness it presented us with a unique kind of aesthetic affordance.

Fourfold Beauty – The 1866 Text of *Origin*

Through four years of reviews, notes and letters, the stage had been set for Darwin’s first major theoretical statement regarding beauty in a public medium, one that was marked in its structure not just polemically by CROE, but, I argue, constitutively. This intervention came in the fourth edition of *Origin*, with Darwin making considerable revisions and additions to his covert rebuttal of Huxley and Kingsley, now offered as a separate section on the ‘Utilitarian Doctrine how far true: Beauty how acquired.’⁵⁷² Darwin reframed this whole passage with an anonymous reference to Argyll’s articles and their reception, expanding upon his account of beauty ‘with respect to the view that organic beings have been created beautiful for the delight of man,—a view which it has lately been pronounced may safely be accepted as true, and as subversive of my whole theory.’⁵⁷³ If this was an updated response to a hackneyed tradition of natural theological aesthetic theory, it was one catalysed by the persistence of this tradition, not least as it had governed reactions to Darwin’s work.

In line with Darwin’s sketches of various definitions of beauty corresponding to different teleological structures in his notes, he now offered a summary of multiple

⁵⁷¹ CUL-DAR47.22v.

⁵⁷² See *Origin* pp. 237-241.

⁵⁷³ *Ibid.*, p. 237.

approaches towards beauty in *Origin*. Rather than simply gesturing towards sexual selection as *the* explanation of beauty and leaving the rest to chance, Darwin made four distinctive glosses on the idea of beauty, first in terms of a subjective and culturally (racially) determined concept, second as an ontological deflation of the claims of design (beauty as an extrinsic claim), third as a biosemiotic concept (where forms ‘have become through natural selection beautiful’), and fourth as the real beauty produced by sexual selection.⁵⁷⁴ This gave Darwin four distinctive concepts of beauty corresponding to each of these glosses: a cultural concept, an accidental property, a functional sign, and a mode of genuine aesthetic purposiveness (the dysteleological form produced by sexual selection). Although this was not yet a fully developed theory, and Darwin did not yet fit these various registers of beauty together coherently, the interest of this theoretical breakthrough remains. Darwin had finally found a way to develop an ontologically deflationary account of beauty that still understood certain claims to beauty as referring to a real property in the world. Sometimes our pleasures were a reliable guide, but sometimes mislead us.

Initially, Darwin offered what might appear as a wholly deflationary gesture regarding beauty, turning away from any theory of objective properties and towards the subjective ascription of beauty, writing that ‘I may first remark that the idea of the beauty of any particular object obviously depends on the mind of man, irrespective of any real quality in the admired object; and that the idea is not an innate and unalterable element in the mind.’⁵⁷⁵ This is a relative compressed formulation, but sought to move the onus of any aesthetics towards the ‘idea of beauty’ motivating judgements, rather than beauty as a ‘real quality’ of an object. Yet, although our judgement of beauty doesn’t have to correspond to any real formal feature in the world, representations of beauty that sanctioned judgements were not simply subjective, but tied to broader communities of taste. For instance, the ‘beau-ideal’ of human form differed, with ‘men of different races admiring an entirely different standard of beauty in their women.’⁵⁷⁶ Despite framing this difference in racial terms, cultural and racial concepts of beauty remained largely indifferent for Darwin, with divergences in racial ‘beau-ideal’ analogous to changing historical cultures that altered our aesthetic dispositions (where, for example, ‘the idea also of beauty in natural scenery has arisen only within modern

⁵⁷⁴ Ibid., p. 238.

⁵⁷⁵ Ibid., pp. 238-239.

⁵⁷⁶ *Origin*, p. 239.

times').⁵⁷⁷ Thus, although the idea of beauty remained ill-defined, its characteristic feature was to shift, with cultural or racial differences in the present reflective of a changing standard through time. Beauty, in this sense, was a question of the internal dynamics of taste. But what were these dynamics?

Darwin wouldn't publicly address this problem for now, with any positive psychology of taste remaining a major lacuna in his theory. However, for the specific purposes of Darwin's theory in 1866, this wasn't a gap that needed resolving yet. In Darwin's eyes, all that was required was to contest the claim that *all* ascriptions of beauty were claims to its objective reality. Indeed, with this first, largely negative approach to beauty advertised, Darwin made its ontologically deflationary purpose clear, returning to the issue of beauty for beauty's sake that had occupied Lyell regarding Argyll's claims – 'the view of beautiful objects having been created for man's gratification.'⁵⁷⁸ For Darwin, this should be understood as an empirically verifiable claim, and that 'it ought to be shown that there was less beauty on the face of the earth before man appeared than since he came on the stage.'⁵⁷⁹ Fossil beauty had been resurrected as a live issue of public debate, with Darwin framing his argument as a series of rhetorical questions, asking 'were the beautiful volute and cone shells of the Eocene epoch, and the gracefully sculptured ammonites of the Secondary period, created that man might ages afterwards admire them in his cabinet?'⁵⁸⁰ For Darwin the facts spoke clearly to the negative, with beautiful form discoverable through geological history and so offering no good reason to believe that such form was aesthetically purposive *for us*.

Inverting the argument of Miller or Kingsley, Darwin understood our temporal disjunction with fossil beauty as analogous to our perceptual remoteness from the beauty of invisible forms that teem within the oceans. Making public his thoughts as they had been inspired by his correspondence with Thwaites ('few objects are more beautiful than the minute siliceous cases of the diatomaceæ: were these created that they might be examined and admired under the higher powers of the microscope?') Darwin now had a ready explanation for many of these accidental kinds of beauty, where, 'the beauty in this latter case, and in many others, is apparently wholly due to symmetry of growth.'⁵⁸¹ The form

⁵⁷⁷ Ibid., p. 239.

⁵⁷⁸ Ibid., p. 239.

⁵⁷⁹ Ibid., p. 239.

⁵⁸⁰ Ibid., p. 239.

⁵⁸¹ *Origin*, p. 239.

produced by morphogenetic law was easily mistaken for authentic purposiveness, and in these instances the ontological deflation of beauty was possible because there was no intrinsic link between the beauty we perceived and the dysteleological law that produced it. Such aspects of form were like the beauty of an ammonite discovered by happenstance 100 million years after its demise, and which could not be aesthetically purposive for us. This, as I understand it, was the second distinctive kind of beauty that Darwin codified in the fourth edition of *Origin*, comprehending a domain of aesthetic objects defined by the fact that they are produced by an efficient causal structure only contingently related to the faculty of taste that makes a judgement regarding them. There was no essential relational property that inhered between the formal properties of the object and the faculties of the aesthetic subject. Extrinsic judgements must not be confused with an ontological claim, or as a claim to intrinsic aesthetic purposiveness. Certain forms or structures are inherently pleasing to our faculties, but CROE no longer applied.

The third kind of beauty theorised in the 1866 text of *Origin* was beauty produced by natural selection, largely phrased in the same terms as had been developed in Darwin's notes of 1865 as a way of understanding how functional signs develop in nature (biosemiosis). However, in line with the presiding teleological framework that motivated the anatomy of kinds of beauty offered in *Origin*, Darwin now made clearer how biosemiotic beauty was tied to a unique set of selective circumstances driving the production of this form. Slipping back into discussing beauty as if it represented an objective claim, for Darwin 'flowers rank amongst the most beautiful productions of nature,' and, decisively, 'they have become through natural selection beautiful.'⁵⁸² The beauty of flowers was neither a function of accident, nor was it produced by an aesthetic agency in nature properly speaking (sexual selection), but represented a distinctive teleological structure, caught in the paradoxical situation that it was 'natural selection' (functional purposiveness) that drove the production of form purpose-for-perception we subsequently registered as beautiful. The originary characteristic of this kind of beauty was *contrast*, where form existed to be perceptible and so naturally selected on this basis; for instance, the form of a flower intended to be

⁵⁸² Ibid., p. 239.

‘conspicuous in contrast with the greenness of the leaves, that they might be easily observed and visited by insects, so that their fertilisation might be favoured.’⁵⁸³

To reiterate, this coevolutionary production of purposiveness did not just rely on the existence of insects, birds and other pollinators or dispersal vectors indifferently, but only insofar as they possessed perceptive capacities, and, supervening upon this basis, agency. Only when this agency condition was met was form as evolved sign possible, and, phrased as a counterfactual, for Darwin ‘we may safely conclude that, if insects had never existed on the face of the earth, the vegetation would not have been decked with beautiful flowers,’ producing a world filled with ‘only such poor flowers as are now borne by our firs, oaks, nut and ash trees, by the grasses, by spinach, docks, and nettles.’⁵⁸⁴ Through iterative rounds of agency, generations of animals select for the very signs they discern, with the phenomenological availability of form functioning like a ratchet, becoming selected to be more visible *because* of its visibility to animals seeking food or a mate. In contradistinction to the general claim that natural selection was not the driver of beauty as the purposeless purpose properly speaking, for Darwin something in the real formal properties of flowers represented an aesthetic half-way house, albeit one where we still ascribed beauty extrinsically. Yet, despite presenting a way to naturalise certain kinds of beauty as they reflected an underlying formal reality (and Darwin’s muddying the waters by discussing flowers as if they were truly beautiful), biosemiotic beauty was still not real aesthetic purposiveness. Only the fourth kind of beauty – ornament produced by sexual selection – was.

Sexual selection has been subject to growing historical commentary, but, in a way that has escaped notice (even in Evelleen Richards’s otherwise comprehensive account), where Darwin first offered sexual selection as a more extensively developed theory of beauty, it was done so in order to specifically defuse the challenge of natural theological aesthetics.⁵⁸⁵ Indeed, Darwin even phrased sexual selection in the terms Lyell used regarding Argyll’s 1864 critique, that organisms ‘have been rendered beautiful for beauty’s sake:’

I willingly admit that a great number of male animals, as all our most gorgeous birds, certainly some fishes, perhaps some mammals, and a host of magnificently coloured butterflies and some other

⁵⁸³ Ibid., p. 239.

⁵⁸⁴ Ibid., pp. 239-40.

⁵⁸⁵ Evelleen Richards, p. 384.

insects, have been rendered beautiful for beauty's sake; but this has been effected not for the delight of man, but through sexual selection, that is from the more beautiful males having been continually preferred by their less ornamented females. So it is with the music of birds. We may infer from all this that a similar taste for beautiful colours and for musical sounds runs through a large part of the animal kingdom.⁵⁸⁶

Darwin's throwaway framing of sexual selection in this passage ('on the other hand') belies the extraordinary dimensions of what he was actually claiming, not least in that it apparently directly contradicted the initial formulation he had given of beauty as a question of taste 'irrespective of any real quality in the admired object.'⁵⁸⁷ However, because Darwin's overall approach to aesthetic categories was now couched in terms of a general deflationary relativism it gave Darwin room, *contra* Argyll, to carefully reconstruct and delimit the conditions under which beauty could be understood as an objective claim regarding form. Through sexual selection beauty was *transformed into* a real property of the world, and so our ascription of beauty represented a genuine ontological claim. Moreover, where sexual selection was structured in direct parallel to CROE, the claimed existence of aesthetic form in nature was now understood as sanctioning the circular inference 'that a similar taste for beautiful colours and for musical sounds runs through a large part of the animal kingdom.' As mind and forms were corollaries, or coproduced as the polarities of a relational property (like a secularised correspondence), the inference of one to the other was secure. So, on the presumption of a common faculty or capacity for taste (as yet unexplained), organisms were understood to make selective decisions regarding their conspecifics through specifically aesthetic criteria. Form was 'rendered beautiful for beauty's sake,' as an immanent aesthetic purposiveness within nature. Where the selection of conspecifics materialised the idea of beauty across consecutive generations, such beauty was made into a real – but teleologically distinctive – property of the world.

This is certainly how certain sympathetic contemporaries now interpreted sexual selection. James Shaw (1826-1896), an educator and occasional author, had corresponded with Darwin regarding beauty in 1865 and 1866, and following the publication of the fourth edition text publicly defended Darwin's theory of beauty in the *Athenaeum* as 'the first likely

⁵⁸⁶ *Origin*, p. 240.

⁵⁸⁷ *Ibid.*, p. 239.

solution of what has been for ages an inscrutable problem.’⁵⁸⁸ Shaw described that Darwin’s claim concerning the beauty of animals and their capacity to appreciate it implied a bidirectional causal *process* by which an aesthetic subjectivity *and* objective instantiations of beauty were co-constituted, such that ‘the selection of beauty in their mates by some animals is there made to follow from their appreciation of it, so that effect and cause mutually throw light on each other.’⁵⁸⁹ As Shaw wrote to Darwin somewhat rhapsodically of the results of this process of aesthetic self-organisation in nature:

I felt when you first flashed the light of your discovery on me like an astronomer at sight of a new planet. On the poetical side of the suggestion there are a thousand lyrics to be sung by poets and other eloquent persons yet to come. Birds and insects to build up a world of beauty [sic.] is more astonishing than how coral reefs are built up.⁵⁹⁰

Despite being a parochial figure, the example of Shaw demonstrates how Darwin’s theory (when accepted), was read as implying that an objective beauty was ‘built’ into the world by the selective behaviour of animals. What sexual selection achieved was to make ascriptions of beauty prospectively real by preserving the relational structure of CROE, with organisms – aesthetic actants both receptively and creatively – acting to materialise their idea of beauty in the world.

Continuing Problems

However, sexual selection was considerably more complex than Darwin’s condensed statement of its dynamics in 1866, and unexamined difficulties were close to the surface. Even in Shaw’s enthusiastic gloss of sexual selection, obvious gaps loomed (reflecting Darwin’s lacunary exposition), with the mind that appreciated and selected-for form remaining almost wholly unexplored. Although Shaw had gestured towards an inherent causal complexity in sexual selection, where ‘effect and cause mutually throw light on each other,’ the issue remained that mind, and the idea of beauty it possessed, was not, in this model, explained by

⁵⁸⁸ James Shaw, ‘The Feeling of Beauty Among Animals,’ *The Athenaeum*, Nov. 24th 1866, p. 681. For Darwin’s cutting see CUL-DAR84.1.181.

⁵⁸⁹ *Ibid.*

⁵⁹⁰ ‘Letter from James Shaw, 19th April 1866,’ *Correspondence*, xiv.

that selection itself. The 'idea' of beauty, as Darwin had expressed in his first gloss of beauty, remained confused, thought somewhere between subjective taste, cultural taste, and, currently unexpressed, a theory of 'the mind of man' itself. This was the double of another problem, as although Darwin had an account of how beautiful organic form was produced by morphogenetic dysteleology, he had not yet shown how sexual selection could produce form. It could select form that was already somehow there and make it aesthetically purposive, but how did form get there in the first place? Darwin could not just keep thinking each of these different meanings of beauty as operating in isolation, but would have to somehow put them together.

Although *Descent* (1871) provided a book-length exposition of sexual selection, many of the problems and details this theory addressed were worked out by Darwin in the years following the fourth edition of *Origin* in response to renewed natural theological critique. Accordingly, my focus here will be on charting the development of the problems and solutions (new and old) that Darwin would later express in the theory of beauty of *Descent*, but were not, in themselves, the innovation of that text. To this end, my approach will be to analyse the responses offered by Argyll and other contemporaries to the theory of beauty offered in the 1866 text of *Origin*, and, to resolve these issues, how Darwin understood the interactions between three of his four glosses of beauty as they produced complex aesthetic forms (the first, second, and fourth). For my purposes, there are two complications within Darwin's theory that are particularly important. First, how Darwin could theorise sexual selection such that it escaped the apparent circularity at its heart; namely, the relationship between a taste taken to produce form, and the development of a taste *for* such form. Darwin's solution, offered in the period of the publication of *Variation* (1868), would be analogous to that that he offered regarding how all living forms became available to selective processes (natural, artificial or sexual), with the relationship between variation and selection understood as representing the contingent conjuncture between two distinctive causal mechanisms. The formation of the taste that selects, and the production of the form it chooses, were related, but largely independent in their dynamics. Yet, coordinately, the relationship between selective teleology, and the formation of taste itself, had not yet been resolved. Accordingly, the second complication is how Darwin understood taste formation as a process that was driven by its own unique dynamics. This second overarching difficulty in Darwin's theory provides a way of returning to the long-term question of extrinsic or intrinsic attributions of

aesthetic purposiveness, and how different kinds of beauty, themselves indexing differing underlying teleological structures, interact. Adequately resolving how a.), form is produced; b.), taste is produced; and c.), how sexual selection sutures form and taste, provides a way of finally clarifying the link between an extrinsic judgement of beauty, and the forms in nature that had an intrinsic aesthetic purposiveness.

The subtler dimensions of this second problem, and the loose end it represented for the explanatory power of sexual selection, are visible in the very definition of beauty Darwin gave in *Descent* (1871), where, on the foundation of physiological commonality implied by common ancestry, 'the perceptive powers of man and the lower animals are so constituted that brilliant colours and certain forms, as well as harmonious and rhythmical sounds, give pleasure and are called beautiful.'⁵⁹¹ Yet, how did this sense of beauty for 'brilliant colours and certain forms,' if not directly related to conspecifics in sexual selection, receive a naturalistic explanation? This problem was particularly pressing within the immediate context of the fourth edition of *Origin*, because Darwin, at least partially secured in his ability to offer an explanatory framework for the purported existence of beautiful form in the world, doubled down regarding the generality of beauty. Amongst the additions made to the conclusion of *Origin*, Darwin mounted the claim that we could now 'understand how it is that such harmonious beauty generally prevails throughout nature' on the basis of the anatomy of kinds of beauty he had offered.⁵⁹² Darwin restated his definitions of beauty, with our perception of beauty pointing towards either the lawful production of organic structures ('symmetry of growth'), signs produced by adaptive utility ('flowers and fruit [...] rendered conspicuous by gaudy colours'), or intrinsically beautiful forms, produced to that end by the agency of organisms (the 'brilliant and beautiful colours' and 'other ornaments' produced by 'sexual selection').⁵⁹³ Indeed, there was perhaps *more* beauty in the world than we were aware, especially as certain animals represented 'exceptions according to our ideas of beauty' (exhibiting, for instance) a 'distorted resemblance to the human face.'⁵⁹⁴ What appeared uncanny might be in conformity with taste for different species, and so be real beauty, however imperceptible for us. Yet, in this assertion Darwin's theory ran up against the same

⁵⁹¹ *Descent*, II, p. 353.

⁵⁹² *Origin*, p. 557.

⁵⁹³ *Ibid.*, p. 557.

⁵⁹⁴ *Ibid.*, p. 557.

overarching problem: what sanctioned claims to beauty more generally, when the only certain route to naturalising CROE was sexual selection? Could we only make intrinsic aesthetic judgements regarding the form of our conspecifics? Darwin had to find a way to secure judgements concerning beauty *beyond* sexual selection.

Once more, these difficulties were brought home by Argyll, whose *Reign of Law* (1867) offered direct response to the fourth edition of *Origin*. Argyll particularly singled out Darwin's claim that the theory offered therein was a counter to 'the view that organic beings have been created beautiful for the delight of man.'⁵⁹⁵ Although Argyll was happy to triumphantly ventriloquise Darwin's own admission of the subversiveness of this anthropocentrism to claim that this 'incompatibility,' if true, was by itself 'absolutely fatal' to Darwin's theory, Argyll's argument also subtly changed emphasis, now proclaiming that there was no question of beauty being resolved in terms of 'the relation in which natural beauty stands to Man's appreciation of it.'⁵⁹⁶ Argyll perceived that heretofore Darwin had not responded to the precise argument made by many natural theological authors – from Macculloch to Miller to Kingsley – but had ventriloquised CROE as simply implying the relationship between the world and the pleasures of humanity. Yet, for Argyll this 'evades the real point at issue,' representing 'quite a separate question' to an aesthetics of divine design.⁵⁹⁷ The strong ontological claim for beauty or ornament made by Argyll was such that it must necessarily exist independently of any human subject, and so turned Darwin's argument against itself:

It is certain enough that the gift of ornament in natural things has not been lavished, as it is lavished, for the mere admiration of Mankind. Ornament was a universal – applied upon a scale at once as grand and as minute as now – during the long ages before Man was born. Some of the most beautiful forms in Nature are the shells of the marine Mollusca, and many of them are the richest, too, in surface ornament. But, prodigal of beauty as the Ocean now is in the creatures which it holds, its wealth was even greater and more abounding in times when there was no man to gather them. The shells and corals of the old Silurian Sea were as elaborate and as richly carved as those which we now admire: and the noble Ammonites of the Secondary ages must have been glorious things indeed.⁵⁹⁸

⁵⁹⁵ Ibid., p. 238.

⁵⁹⁶ *Reign of Law*, pp. 197-8.

⁵⁹⁷ Ibid., p. 198.

⁵⁹⁸ Ibid., pp. 198-9.

Although to the modern reader (and Darwin) the evidences of geological time might seem injurious to theological claims, for Argyll this same geological time actually represented sufficient proof for the assertion of an aesthetic ‘universal.’ Long before there were any human subjects ‘born’ to act as percipients and take enjoyment in beauty, ornamental forms were produced, and so the pleasures of beauty must exist for some *other* end or interested party.

As I have discussed, in the fourth edition of *Origin* Darwin had offered the examples of ammonites and Diatoms as an *ab absurdum* critique of the anthropocentrism of natural theological aesthetic claims, but now Argyll would joyfully reappropriate these same examples.⁵⁹⁹ Without irony, Argyll would assume these forms as indicative of the problem of Darwin’s theory *because* they had no relationship to humans, and so must therefore evidence the alternative that Darwin did not countenance. Argyll made a diagnostic claim of asymmetry between aesthetic appreciation and design, showing ‘that although Man was intended to admire beauty, beauty was not intended only for Man’s admiration.’⁶⁰⁰ Following upon the ramification of Argyll’s concept of the ‘Superhuman,’ as the ‘love and desire’ of properties such as ‘mere ornament and mere variety’ are ‘universal in the mind of Man,’ it is impossible ‘that this universal aim and purpose of the mind of Man should be wholly without relation to the aims and purposes of his Creator.’⁶⁰¹ Although Argyll obfuscated somewhat with a rhetorical question – ‘He that formed the eye to see beauty, shall He not see it?’ – phrased directly, Argyll’s fundamental assertion was that Darwin’s argument could still be defeated as long as we assume that God creates beautiful forms for his own enjoyment.⁶⁰² Darwin had, after all, left this possibility open by discussing only the claim ‘that organic beings have been created beautiful for the delight of man,’ and not a fully-fledged natural theological idealism (the divine aesthetic self-relationship we partake mediately within).⁶⁰³ Argyll rehearsed the old arguments of natural theological aesthetics, and readjusted Darwin’s theory in their image.

However, amongst the old examples that the *Reign of Law* resurrected to support the natural theological account of beauty, Argyll adduced one that would, given the role it would

⁵⁹⁹ Argyll made the same claim regarding Diatoms. See *ibid.*, p. 199.

⁶⁰⁰ *Ibid.*, p. 199.

⁶⁰¹ *Ibid.*, pp. 200-201.

⁶⁰² *Ibid.*, p. 201.

⁶⁰³ *Origin*, p. 237.

subsequently play in *Descent*, become perhaps the most emblematic example for Darwin's theory of sexual selection more generally.⁶⁰⁴ This was the plumage of the male Argus pheasant, that, as I have discussed, had already played its part within the history of anglophone natural theological discourse, where its ornamentality had been commented upon and actively assumed as designed in the translation of Cuvier's *Règne Animal*, despite undercutting the adaptive function that was the cornerstone of Cuvier's work. Given the turn of natural theology towards aesthetic teleology as the overarching characteristic of design, such form no longer represented a problem, but remained the basis by which Argyll critiqued the adequacy of Darwin's thought. As Argyll wrote, the case of the male Argus pheasant was the 'one instance in Nature (and, as far as I know, only one) in which ornament takes the form of pictorial representation:'

[their] feathers are decorated with a series of conspicuous spots or "eyes," which are so coloured as to imitate the effect of balls. The shadows and the "highlight" are placed exactly where an artist would place them in order to represent a sphere. The "eyes" of the Peacock's train are wonderful examples of ornament; but they do not represent anything except their own harmonies of colour. The "eyes" of the Argus Pheasant are like the "ball and socket" ornament, which is common in the decorations of human art.⁶⁰⁵

For Argyll, the Argus pheasant represented the inescapable evidence of a strong ontological analogy between divine and human art, an analogy materialised to the extent of a common ornamental style with the 'decorations of human art.' In a way that even the peacock didn't manifest, the common *representational content* of human aesthetic praxis and forms in nature became the ultimate evidence of their common logic. Like Miller's or Whewell's architectural reading of natural forms, the claim of aesthetic design was not simply the existence of a common teleological structure of the purposeless purpose in art and nature, but the existence of a common stylistics as formal language of ornament.

Darwin annotated his copy of the *Reign of Law* where it criticised the 1866 additions to *Origin*, writing, whilst Argyll was busily proclaiming ornament and beauty as the universal objective figments of God's aesthetic self-relation, 'but there is no such thing as beauty,

⁶⁰⁴ The role of the Argus pheasant in the *Descent* has been discussed at length. See, among others, Voss, pp. 160-177; Smith, pp.124-36; Evelleen Richards pp. 437-9; Munro.

⁶⁰⁵ Ibid., pp. 202-203.

except to [the] eyes of some living creatures.’⁶⁰⁶ As I have discussed, if Darwin earlier appeared to insist on an ontologically deflationary account of beauty, he did whilst also quietly reinscribing a *relational structure* in the logic of ascriptions of beauty to natural form. What matters in the judgement of beauty or ornament as an ontologically meaningful claim was not the simple affirmation or denial of the claim to objectivity of beauty – whether it is “out there” in the world waiting to be discovered as a definite property of being – but, as Lyell hinted at in his letter to Darwin following Argyll’s 1864 address, its relationship to the recipient of pleasure in this beauty: who is it for, and who benefits from its pleasures; *cui bono*? Indeed, subsequent to the publication of the *Reign of Law*, Darwin communicated with Lyell on the same theme, Darwin fixating, once more, on what had become an emblematic issue – that for there to be, as Darwin claimed there was, an immanent aesthetic of ‘beauty for beauty’s sake’ in the world, there must be some ‘sentient being’ for whom this was beautiful.⁶⁰⁷ Only then could the reality of beauty be proclaimed, because this beauty was built into the world by that agency. Any other posit was absurd: like the beauty of ammonites in the Jurassic ocean and the intricate forms of diatoms languishing in the depths of the present, Argyll ‘might have as well said that Love existed during the Secondary or Palæozoic periods.’⁶⁰⁸

Decisively, it was no longer just in reference to ‘man’s gratification’ that this rationalisation could be made, but only needed the ‘eyes of some living creatures’ to naturalise the production of beautiful form.⁶⁰⁹ Could, however, this argument be made convincingly for complex and compositionally intricate ornaments such as the plumage of the male Argus pheasant without straining the bounds of credulity? Where Argyll’s argument had pivoted towards ‘pictorial representation’ as the highest evidence of aesthetic design, this very complexity presented both challenge and opportunity; if sexual selection afforded explanations for even the most extreme natural forms imaginable, it would finally hedge Darwin’s aesthetic theory against natural theological critique. However, to give an explanation for such form, Darwin would have to solve the two major outstanding problems of sexual selective beauty as I have outlined them: how beautiful form was produced in the

⁶⁰⁶ [Darwin Annotation] *Reign of Law*, p. 198 [CUL-DAR.LIB.BKS].

⁶⁰⁷ ‘Letter to Charles Lyell, 1st June 1867,’ *Correspondence*, xv.

⁶⁰⁸ *Ibid.*

⁶⁰⁹ *Origin.*, p. 239.

first place so that it became available to selection, and how taste was produced so that it could select such form. The mind, and its aesthetic sense, was not a *tabula rasa*, and natural beings were not a blank canvas upon which forms might be deliberately composed *ab initio*, but must somehow already exist in order to be selected by a sense that already knew what it found beautiful. Ironically, Darwin began developing an answer that would meet these conditions in correspondence with Kingsley (against whose *Glaucus* Darwin's theory was initially developed), after Kingsley had attempted to plug Darwin's work back into his own by using sexual selection as the foremost secondary mechanism that realised the aesthetic ends of design. Darwin not only had to obviate the challenge of more direct accounts of design, but also oblique strategies where sexual selection was not understood as competing with CROE, but had become its diachronic means of operation.

Beauty as Causal Conjunction

Kingsley had written to Darwin following the publication of *The Reign of Law*, similarly resolving the question of natural beauty in terms of who or what the pleasures of beauty were intended for.⁶¹⁰ Kingsley understood sexual selection as providing clear proof that organisms were designed to take pleasure in beauty *and* act as the secondary causes of beauty and 'endless variation,' criticising Argyll for failing to take account of what Darwin had shown through the conceptual innovation of sexual selection. However, Kingsley simultaneously criticised Darwin for ignoring the role of divine taste and the purposiveness of otherwise purposeless forms in nature for both the 'æsthetic education & pleasure of man,' and 'for the pleasure of a God who rejoices in his work as a painter in his picture.'⁶¹¹ The teleological form of sexual selection allowed it to become a novel element in a pre-existing natural theological aesthetics, with the telos of natural beauty existing as a complex negotiation of the trifold enjoyment of God, the enjoyment of animals and the enjoyment of humanity:

What he says about the humming birds is his weakest part. He utterly overlooks *sexual* selection by the females, as one great branch of Natural selection. Why on earth are the *males* only (to use his

⁶¹⁰ 'Letter from Charles Kingsley, 6th June 1867,' *Correspondence*, xv.

⁶¹¹ *Ibid.*

teleological view) ornamented, save for the amusement of the females *first*? In his earnestness to press the point—(w^h. I think you have really overlooked too much) that beauty in animals & plants is intended for the æsthetic education & pleasure of man, And (as I believe in my old fashioned way), for the pleasure of a God who rejoices in his works as a painter in his picture— In his hurry, I say, to urge this truth, he has overlooked that beauty in any animal must surely first please the animals of that species, & that beauty in *males* alone, is a broad hint that the females are meant to be charmed thereby—& once allow that any striking new colour w^d. attract any single female, you have an opening for endless variation.⁶¹²

The causal priority of an intraspecific aesthetic pleasure, the ‘beauty’ that must ‘first please the animals of that species,’ did not exclude the alternatives of human and divine enjoyment, as, in all cases, design could indifferently accommodate all apparent conflicts or difficulties as part of some preestablished harmonious totality that was expressed through ‘endless variation.’ Sexual selection was made the vehicle of unity in variety, and thus made the vehicle of the habitual aesthetic concerns of natural theology. If any reminder was needed, Kingsley’s response stands as a stark indication of how Darwin’s approach to beauty could be easily recuperated by his contemporaries as part of the very theory that it was in the process of being developed out of; the margins remained fine.

Darwin’s response to Kingsley was politic, focussing on an areas of agreement, and, in line with his annotation in the *Reign of Law*, reiterated the claim that it was ‘absurd to speak of beauty as existing independently of any sentient being to appreciate it.’⁶¹³ As for that other great issue, ‘with respect to the Deity having created objects beautiful for his own pleasure,’ Darwin made an agnostic plea to lack of philosophical overlap – ‘I have not a word to say against it but such a view c^d hardly come into a scientific book.’⁶¹⁴ However, despite sheltering behind an agnostic repudiation of design, it clearly mattered a great deal for Darwin’s aesthetic theory whether or not a teleological structure of purposeless purposes in nature ultimately implied either divine intervention or an unsupervised natural process. In 1867 Darwin desperately needed details to banish the God of the gaps, and the issue raised by the development of intricate plumage, from the peacock to the Argus, provided a way forward. The following year Darwin published his *Variation* (1868), and the same general

⁶¹² Ibid.

⁶¹³ ‘Letter to Charles Kingsley, 10th June 1867,’ *Correspondence*, xv.

⁶¹⁴ Ibid.

argument he used to elude the natural theological reading of natural selection proposed by Asa Gray could be used to solve the problem of aesthetic form. Selection was not sufficient by itself as it could be reappropriated as a theory of divine aesthetic purposiveness, and so needed a theoretical supplement. This section gives details of this supplement, but in outline, it was only by positing the interaction of multiple, and, crucially, *otherwise unrelated*, causal modes that biological form could be fully explained. The same argument that Darwin had given in embryonic incarnation to Frances Wedgwood returned, as the random variations that first produce ornamental or aesthetically attractive form – utterly purposeless as they are – possessed no conceivable link to providence. Apparent randomness or disorder might contain the seeds of beauty. The dysteleology that once troubled Darwin now provided a way out.

As Darwin replied to Kingsley, the genesis of beautiful form was split between a.), the sexual selective decision regarding beauty as it was differentially encountered in the variability of individual conspecifics, and b.), the dysteleological causal operation of ‘laws of growth’ that produced such variability, but functioned on a causal footing that was – relative to the agency that would make such form purposive by selecting it on aesthetic grounds – wholly contingent:

No doubt sexual selection seems very improbable when one looks at a peacock’s tail, but it is an error to suppose that the female selects each detail of colour. She merely selects beauty, & laws of growth determine the varied zones of colour: thus a circular spot, in the same manner as I have seen the black wing-bar in pigeons become converted into 3 bars of colour elegantly shaded into each other.⁶¹⁵

In order to explain how form such as the peacock’s tail was possible, it was not necessary to speculate regarding the existence of an advanced aesthetic sense in the mind of female peacocks. We do not need to ‘suppose that female selects each detail of colour,’ but only suppose that a selective agent is possessed of some aesthetic representation (a beau ideal, say), and on that basis ‘merely selects beauty’ in conformity with this *sui generis* idea of taste. Selection can operate largely unconsciously and in ignorance of its causal basis because this selection does not in itself produce any given form – a peacock, obviously, is not an artist. Instead, deterministic ‘laws of growth determine the varied zones of colour,’ with the cumulative operation of iterative rounds of selection and inheritance having the effect of

⁶¹⁵ ‘Letter to Kingsley, 10th June 1867’.

producing progressive and complexifying forms. This form, in turn, represents the baseline upon which new variations supervene. In the case of the ocelli on the peacock's tail, these laws of growth were such that 'a circular spot w^d almost certainly become developed into circular zones,' as long as females kept selecting for form in conformity with a relatively stable (heritable) aesthetic representation. The more any variation corresponds to an ideal of beauty, or the representations of the 'aesthetic faculty,' the more they will be selected to materialise that ideal.⁶¹⁶ Beauty was a ratchet.

A fuller account of beauty that deployed this model of multifarious causal determination would have to wait for *Descent*; in 1866-68 Darwin's immediate worry remained how to understand the ultimate relationship of selective teleology, both functional and aesthetic, to natural theological argument. Within this context, *Variation* (ostensibly concerned with how multiple causal or teleological modes interacted to produce organic form in artificial and natural selection) provided key resources to understand the production of beauty *against* the recapture of sexual selection by design. Yet, curiously, beyond how this work brought to fruition Darwin's developing account of the relationship between 'chance variation' and selection, very little has been made regarding how *Variation* might offer key resources for reframing Darwin's teleology as the interplay of multiple and distinctive causal modes, and, moreover, what this might mean for any theory of beauty.⁶¹⁷ As is apparent in Darwin's letter to Kingsley, experiments with the breeding of fancy pigeons provided an empirically demonstrable model for the development of the plumage of peacocks, and the analogy between various kinds of selection and the role of cultures of fancying has long been noted as a central component in the development of Darwin's theory.⁶¹⁸ However, my interest here is directed at how the teleology of *Variation* provides fundamental resources for understanding the role of mind in sexual selection, both in that the facultative basis of sexual selective agency was not itself understood by Darwin in terms of selection, and, equally, how aesthetic agency exercised by organisms was aimed at structures produced on a causal register fundamentally distinctive to selection itself.

⁶¹⁶ *Descent*, I, p. 64.

⁶¹⁷ See, for instance, John Beatty, 'Chance Variation,' James Lennox, 'Darwin and Teleology,' in *The Cambridge Encyclopedia of Darwin and Evolutionary Thought*, ed. by Michael Ruse (Cambridge: Cambridge University Press, 2013), pp. 152-157; Curtis Johnson, *Darwin's Dice* (Oxford: Oxford University Press, 2014), pp. 149-153.

⁶¹⁸ See James Secord, 'Nature's Fancy, Charles Darwin and the Breeding of Pigeons,' *Isis*, 72 (1981), 162-186; Evelleen Richards, pp. 291-331.

In this sense, any adequate solution to the outstanding questions of beauty meant resolving how far a subject within the world could effect a meaningful intervention within a complex causal system to which it did not have access. Darwin was long aware of this issue, and during the argument of *Origin* had explored in passing how the causal intervention of artificial selection could have wide-ranging effects despite being aimed at only a limited order of 'external and visible characters.'⁶¹⁹ The general implication of this phenomenological condition was that, beyond the teleological operation of natural selection (which remained the decisive factor in the production of organic beings), the causal process governing the production of form was a black box. As Darwin prefaced the argument of *Variation*, our selective breeding was, as *ars* or *praxis*, ignorant of its causal underpinnings, functioning on the precondition that '[man] unintentionally exposes his animals and plants to various conditions of life, and variability supervenes, which he cannot even prevent or check.'⁶²⁰ This was the extent of our agency, both selectively, but also in *causing* variability, so, although 'no doubt man selects varying individuals [...], the initial variation on which man works, and without which he can do nothing, is caused by slight changes in the conditions of life, which must often have occurred under nature.'⁶²¹ Darwin had provided the briefest outline of some of these processes in *Origin*, noting that among 'the causes of variability' and 'the laws which govern it' were 'the direct action of climate and food, the effects of use and disuse, and of correlation of growth.'⁶²² Insofar as variability was strictly regulated by these ostensible efficient causal laws (the morphogenetic dysteleology I discussed in the previous chapter), we only accidentally caused a variation that was contingent upon our teleological agency. We might try to set these other laws in action, but we could not intrude *within* them or produce the variations we wanted to achieve as the desired telos *of* selective praxis.

Variation – the production of form that became available to selection – had no reference to any kind of selection that might happen to it. Forms were not planned, and could not be cognised *as if* they were planned, with the agency model shared by selection, design and beauty no longer meaningful or theoretically productive when used to think this heteronomous domain of causes. Only the interaction of otherwise unrelated causal modes

⁶¹⁹ *Origin*, 1st edn, p. 83.

⁶²⁰ *Variation*, I, p. 2.

⁶²¹ *Ibid.*, I, p. 3.

⁶²² *Ibid.*, I, p. 3.

could provide adequate naturalistic explanations for form, whether understood functionally or considered as purposeless purpose. The most perspicuous means by which Darwin outlined the relationship between variation and selection as it underpinned evolutionary processes was offered through the recurring metaphor of an architect that used only building materials that had been shaped by some unrelated causal process:

Let an architect be compelled to build an edifice with uncut stones, fallen from a precipice. The shape of each fragment may be called accidental; yet the shape of each has been determined by the force of gravity, the nature of the rock, and the slope of the precipice,—events and circumstances, all of which depend on natural laws; but there is no relation between these laws and the purpose for which each fragment is used by the builder. In the same manner the variations of each creature are determined by fixed and immutable laws; but these bear no relation to the living structure which is slowly built up through the power of selection, whether this be natural or artificial selection.⁶²³

Crucially, although the building blocks of the architectural artifact all ‘depend on natural laws,’ there is ‘no relation between these laws and the purpose for which each fragment is used by the builder.’ The architect was not a God-like figure, but a masterful *bricoleur*. *Technē*, or the appearance of *technē*, yoked a teleological cause to an otherwise contingent efficient causal order. So, although in *Variation* Darwin’s account was aimed at ‘natural or artificial selection,’ as evidenced in his letter to Kingsley, this same theory helped resolve one of the key problems of sexual selection, not least in that the organism-as-aesthetic-composition was one composed from chance or accidental variations. That certain mindless processes in nature would produce beauty (or form deciphered as beautiful) followed from the very fact they were products of ‘fixed and immutable laws.’ As I have discussed regarding both Darwin’s response to Thwaites and the second mode of beauty discussed in the *Origin*, the formal regularity of these processes was enough to give an intuition of aesthetic purposiveness despite the absence of any real aesthetic rationality producing such form (‘symmetry,’ or ‘repetition’ etc.). However, such formal or structural repetition – as the (however accidental) materialisation of law – could take on a real aesthetic purposiveness where it was subsequently selected based upon a properly aesthetic criterion of taste. Darwin’s argument in *Variation* gave the teleological resources to understand how an intergenerational process of iterative acts of selection could make extrinsic aesthetic purposiveness *into* intrinsic

⁶²³ Ibid., II, pp. 248-9.

aesthetic purposiveness. As Darwin wrote back to Kingsley, the peahen 'merely selects beauty, & laws of growth determine the varied zones of colour.'⁶²⁴

The morphological dysteleology that had been seized upon by the design argument, and once unsettled Darwin's selective teleology, was now a central plank in his thought. However, where Darwin now conceptualised organic form as produced by the conjunction of distinctive causal modes, this very splitting condensed within itself two subtly different problems that had to be disentangled: firstly, the ontological problem of contingency that inhered between two causal orders, and secondly the epistemic problem that the efficient causal structure of variation was lost to knowledge, and in its facticity took on the complexion of *chance*. Given this split, as Jacques Monod famously put it, between 'chance and necessity' in Darwin's theory ('natural selection operates *upon* the products of chance and knows no other nourishment; but it operates in a domain of very demanding conditions, from which chance is banned'), *Variation* has formed the centrepiece of many attempts to understand the role of chance in Darwin's writing, where, in the words of Curtis Johnson, the 'core meaning' of chance in the Darwinian corpus was that 'variations [...] are blind (random) with respect to future adaptive needs.'⁶²⁵ It was, as Darwin himself framed it, simply 'ignorance' regarding an efficient causal order that lead us to christen chance as 'spontaneous or accidental variability.'⁶²⁶ Thus, despite the complexity of ever knowing *how* differences of form are produced, and not even needing to know any efficient causal laws to secure selection as the primary driver of evolutionary change, Darwin was against the view that 'variability must be looked at as an ultimate fact, necessarily contingent on reproduction.'⁶²⁷ For Darwin, 'each separate variation has its own proper exciting cause' and 'although we can seldom trace the precise relation between cause and effect' we should still understand that 'each modification must have its own distinct cause.'⁶²⁸

Although it was imperative that there was *some* efficient causal nexus that produced variations in form to prevent the argument from natural selection reverting into a design argument, we only ever have to know this efficient causal requirement in principle. Dysteleology, although elusive to purpose, was entrained to a teleological nexus in order to

⁶²⁴ 'Letter to Kingsley, 10th June 1867'.

⁶²⁵ Johnson, pp. 13-14. Monod, p. 114.

⁶²⁶ *Variation*, II, p. 248.

⁶²⁷ *Ibid.*, II, p. 253.

⁶²⁸ *Ibid.*, II, p. 253.

naturalise it. The morphogenetic vision of Whewellian natural theology, once used to synthesise unity of plan and adaptation, was inverted by Darwin, who married an adaptive dysteleology of beauty (sexual selection) with a morphological dysteleology to think the dynamic production of new organic form. Morphological law could replace any reference to creation (or chance), and the conclusion of *Variation* reused the architect metaphor to specifically disbar the natural theological gloss on selection given by Asa Gray, that *beneficial variations were created*, and so pre-planned such as to realise design diachronically by adaptive transmutation.⁶²⁹ Whatever its possible epistemic status, variation was not simply a given facticity produced by God or chance, but was itself a product of 'fixed laws.'⁶³⁰ These laws were not selection, and selection had no necessary bearing on them, so although the process of variation was not simply left to chance, it was contingent relative to the process of selection itself.

Returning to the more particular terms of beauty and the sexual selective agency co-constituting aesthetic form, these causal and teleological complexities had several unique implications for Darwin's aesthetics. As I have already outlined with reference to Thwaite's diatoms, where the role of efficient causation was brought to the fore in the initial production of form, these effects track the first of the general outstanding problems of Darwin's aesthetic theory (the diremption between the genealogy of the production of form, and the act of selection that makes such form aesthetically purposive). However, as yet, the third term implied in Darwin's theory of beauty – the production of a faculty of taste or 'aesthetic faculty' – remained unexplored. Crucially, although some kind of aesthetic faculty was always proposed as a general condition of possibility for sexual selection, which only ever operated 'according to [a] standard of beauty,' by 1868 Darwin had offered very little explanatory texture for the evolution of mind, or the dynamics of its modification and descent.⁶³¹ Indeed, Darwin's reference towards a 'beau-ideal' as standard of taste in the fourth edition of *Origin* did little more than gesture towards a latent tension, and what this might entail for any aesthetic faculty as a hereditary representation of beauty was rather lost.

⁶²⁹ See, for instance, Asa Gray, *Natural Selection Not Inconsistent with Natural Theology* (London: Trübner & co., 1861) or *Darwiniana*.

⁶³⁰ *Variation*, II, p. 253.

⁶³¹ *Origin*, 1st edn, p. 89.

However, behind the scenes Darwin *did* have a theory of mind, the basic outline of which took shape during a period of intense note-making in the late 1830s.⁶³² As Robert Richards has helpfully summarised this theory, Darwin ‘interpreted instinct as a kind of memory, which could be established in earlier generations and biologically transmitted to succeeding generations,’ such that ‘habits, if practiced over several generations, would gradually modify brain structures, producing something like heritable memories.’⁶³³ For Darwin, mind was not largely determined by a selective mechanism, but remained subject to its own causal dynamics as a *hereditary habitus*. Mental representations or feelings, through repetition, use, or constant association, literally inscribed themselves on the brain as innate properties, and so life history, experience, and memory were potentially hereditary, but, insofar as they were decoupled from selection, didn’t generally fall within a teleological pattern of explanation.

Yet, exactly here, where this theory of mind was decoupled from selection, *Variation*, and its other major theoretical innovation, pangenesis, provided the resources necessary for Darwin to elucidate his theory of mind and taste as it had otherwise gone unremarked in his published works till this point.

Pangenesis, Mind and Beauty

Despite Darwin himself regarding pangenesis as one of his major theoretical contributions, its reception was troubled from the outset, where, as Kate Holterhoff has explored, in the period itself pangenesis left many of its readers ‘more often confused than enlightened.’⁶³⁴ This uneasiness has continued through till the present, and although, for instance, Jonathan Hodge has traced how ‘generation [was] a persistent preoccupation throughout Darwin’s entire career,’ with pangenesis already taking form by the early 1840s, pangenesis has still received comparatively little attention in the literature, especially relative to the vast exegetic corpus surrounding natural selection (and increasingly, sexual selection), with major gaps in

⁶³² See CUL-DAR125 and CUL-DAR126.

⁶³³ Robert Richards, *Darwin and the Emergence of Evolutionary Theories of Mind and Behaviour* (Chicago: University of Chicago Press, 1987), p. 98.

⁶³⁴ Kate Holterhoff, ‘History and Reception of Darwin’s Theory of Pangenesis,’ *Journal of the History of Biology* 47 (2014), 661–695 (p.668).

our understanding remaining.⁶³⁵ As I will now explore, where pangenesis provided a model (in principle) to understand mental faculties as subject to their own unique hereditary dynamics, Darwin's theory of beauty could be rethought as the conjuncture of three distinctive causal orders, with the teleological nexus of sexual selection providing the link by which two otherwise contingently related processes of variation and heredity (form and mind) were sutured and mutually coevolved. By putting together these three causal orders, Darwin's theory made his pre-existing definitions of beauty more consistent, with extrinsic aesthetic judgements becoming an intrinsic purposiveness through the development of mind to have taste *for* those objects, and, circularly, through the selection of objects, to be *for* that taste. Aesthetic subjects and their objects were locked in an ongoing process of coadaptation.

In brief, the speculative model of pangenesis implied 'that the whole organisation, in the sense of every separate atom or unit, reproduces itself. Hence ovules and pollen-grains, — the fertilised seed or egg, as well as buds,— include and consist of a multitude of germs thrown off from each separate atom of the organism.'⁶³⁶ Where every part of a being produced 'gemmules' that provided information to faithfully replicate that part, every modification that happened to an organism, and every individual part of that organism, was inscribed in its being and thereby reproducible and heritable. In the words of Jim Endersby, the great theoretical utility of pangenesis was that it could 'give a unified account of all kinds of generation, from the healing of wounds in trees, to propagation by buds and grafting, to sexual pairings and fertilisation.'⁶³⁷ The formation and dissemination of gemmules was a material and physiological process, subject to efficient causal mechanisms, and, where it took place at a different explanatory register to selection, at a degree of removal from any teleological understanding of functional or aesthetic purposiveness. In fact, pangenesis gave a direct mechanism for how various laws of nonadaptive (dysteleological) descent with modification could be achieved by wholly efficient causal means. For instance, regarding the 'variations caused by the direct action of changed conditions [...] the tissues of the body, according to the doctrine of pangenesis, are directly affected by the new conditions, and

⁶³⁵ M.J.S. Hodge, 'Darwin as Lifelong Generation Theorist' in *The Darwinian Heritage*, ed. by Kohn, pp. 207-245 (p. 209).

⁶³⁶ *Variation*, II, p. 358.

⁶³⁷ Jim Endersby, 'Darwin on Generation, Pangenesis and Sexual Selection' in *The Cambridge Companion to Darwin*, ed. by Johnathan Hodge and Gregory Radick, 2nd edn. (Cambridge: Cambridge University Press, 2009) pp. 73–95, (p. 73).

consequently throw off modified gemmules, which are transmitted with their newly acquired peculiarities to the offspring.⁶³⁸

Where pangenesis has been largely ignored, its possible role in Darwin's theory of beauty remains almost wholly unestablished. Still, there is one notable outlier, with Evelleen Richards tracing how pangenesis had important ramifications for Darwin's explanation of sexual dimorphism, which, inasmuch as it represented a key aspect of Darwin's understanding sexual selection, feeds directly into a theory of beauty. To wit, where Darwin made a conjectural proposal regarding the relative *vigour* of male and female gemmules, he 'could explain how males dominated inheritance, especially in those cases of female choice that particularly interested Darwin, where males were more brightly coloured or ornamented than females and the young resembled the females.'⁶³⁹ However, in line with her general approach, Richards has only focussed on how Darwin used pangenesis to explicate the relationship of sexual selection to heredity of bodily form. So, although the potential importance of pangenesis for a theory of beauty has been given some meaning in terms of sexual selection, this is emphatically *not* the whole of Darwin's account. Moreover, what has never been noted before, and seems profoundly important to me, is that pangenesis provided an explanatory model that underpinned the third key causal aspect of Darwin's theory of beauty – mind – and so the very existence of the 'aesthetic faculty' itself.

Darwin framed the capacity of pangenesis to act as a hereditary model of mind by interpreting it as one more instance of the 'inherited effects of the use or disuse of particular organs,' noting that 'nothing in the whole circuit of physiology is more wonderful' than the fact that the 'mental endowments and bodily powers are all inherited.'⁶⁴⁰ This 'wonderful' capacity for the inheritance of acquired characteristics was a corollary of the physical basis of mind, with changes in mental properties reflective of underlying material changes, where 'with respect to mental habits or instincts [...] when any habit or other mental attribute [...] is inherited, we must believe that some actual modification is transmitted; and this implies, according to our hypothesis, that gemmules derived from modified nerve-cells are transmitted to the offspring.'⁶⁴¹ This was not, in its first formulation, pitched as a theory of

⁶³⁸ *Variation*, II, p. 394.

⁶³⁹ Evelleen Richards, pp. 388-9.

⁶⁴⁰ *Variation*, II, pp. 371-2.

⁶⁴¹ *Ibid.*, p. 395.

beauty, but gave an efficient causal mechanism *for* the ‘aesthetic faculty’ as it would be later theorised in *Descent* (e.g. the ‘deeply-laid principle of inherited associations’ which explained the emotionally expressive power of music).⁶⁴² It would, likewise (and, without pangenesis ever being mentioned), represent the general mechanism of inheritance underpinning Darwin’s argument in *Expression of Emotions* (1872), that ‘physical change is produced in the nerve-cells or nerves which are habitually used,’ and this modification by use or habit is ‘inherited.’⁶⁴³

Although Darwin would hint towards a cognate explanation regarding the development of the faculty of taste in *Descent*, even here his treatment was relatively brief, with an intergenerational hereditary habitus constituted by efficient causes appreciated as an ‘aesthetic capacity [...] having been advanced through exercise or habit in the same manner as our own taste is gradually improved.’⁶⁴⁴ This paucity of explanation was addressed somewhat in the second edition of *Descent*, with Darwin making additions to his discussion of the unanalysability of aesthetic pleasure. Whatever our difficulties in coming to understand aesthetic pleasure, for Darwin it must be the case that habituation – operating through an independent causal mechanism – was somehow shaping the ‘sense of beauty:’

‘why certain bright colours should excite pleasure cannot, I presume, be explained, any more than why certain flavours and scents are agreeable; but habit has something to do with the result, for that which is at first unpleasant to our senses, ultimately becomes pleasant, and habits are inherited.’⁶⁴⁵

The perception and enjoyment of form without a determinate end (linked to real aesthetic purposiveness) shaped the aesthetic faculty by habituation, with our changes in taste, or changes in the aesthetic pleasures we took in objects, itself transmissible. We have already seen – whether in Kames’ model of paideia, or Chalmer’s reconceptualisation of association as adaptation – how many natural theological theories had themselves managed an accommodation between the association and aesthetic common sense. Yet Darwin’s theory wasn’t just aimed at individual development (ontogenesis) as it reflected the predetermined *telos* or possibilities of innate sense, but a hereditary mechanism of taste, making the

⁶⁴² *Descent*, II, p. 337.

⁶⁴³ Charles Darwin, *Expression of Emotions* (London: John Murray, 1872), p. 27.

⁶⁴⁴ *Descent*, II, p. 401.

⁶⁴⁵ *Descent*, p. 92.

synthesis of innatism and association that natural theological aesthetics had often flirted with into a *general* theory of development (phylogenesis). Our innate tastes were part of an ongoing process, and so, alongside sexual selection, Darwin offered a mechanism for a hereditary faculty of taste that explained how we can take pleasure in form without such claims to beauty implying an ontological claim to its reality as purposiveness-for our sense, as well as supplying the facultative basis by which selection occurred.

How Darwin would work out the later details of this mechanism of taste formation through the early 1870s is a question for future research, but by 1868 Darwin had finally developed an overarching teleological architecture for his theory of beauty. Quite aside from any selective teleology producing form, efficient causation must be accounted for, both at the objective pole of the aesthetic relationship, by providing a more explicitly defined role for the accidental production of forms, but also at the subjective pole of this relationship, by showing how the faculty of taste as a hereditary mental property itself evolved. Yet, none of this is to deny the profound importance of sexual selection. Aesthetic agency, despite having no straightforward way of relating to its own causal basis, still represented a real cause through mate choice, which, by producing beautiful form, altered the objects which the 'aesthetic capacity' encountered and was 'exercised' upon and habituated to, thereby transforming the ultimate conditions of its own selective agency. Instead, we can now rebalance how we think about the component aspects of Darwin's theory of beauty, which needed the agency of selection to naturalise the teleological form of CROE, but also offered a theory grounded in the formation of taste relative to objects that took very little account of aesthetic purposiveness as such. The aesthetic teleology of selection was defined as a third term alongside two distinctive efficient causalities, explaining the form of the purposive without purpose as an intrinsic aesthetic end in nature and thereby eluding the fatal doctrine. Because a causal loop inhered between selective agency and the hereditary habitus, the reality of the purposeless purpose within nature could defeat the challenge of natural theological aesthetics. Selection might happen on the basis of this 'aesthetic faculty' as it coevolved with its objects, but this selective agency thereby had the same general form of any mental agency relative to its material and hereditary predetermination, and, as implied by pangenesis, possessed a physical substrate in the brain capable of developing in relative isolation to any sexually selected bodily form. Pangenesis shows how Darwin could make consistent a theory of beauty in his work *beyond* sexual selection.

Although it was only *Descent* that would fully cash in on hereditary habitus as a model of mind, even by 1867-8 this had become the implicit structure of Darwin's theory of beauty as it responded to the challenge mounted by Argyll. Irrespective of the complexities entailed by Darwin's mature teleology, by stabilising the role of real agency within certain natural forms, Darwin was able to solve the challenge of CROE in 1868. According some measure of reality to the agency of sexual selection allowed the relational ontology of beauty to be placed on a naturalistic footing, and so the otherwise unrelated theoretical challenges that Darwin confronted in *Variation* provided a way of working out what a naturalised form of CROE implied. The agency of an imagined architect faced with a pile of preformed rocks was like the agency of the female peacock faced with the play of light on a feather, the design of which followed from some unrelated and unknown law. What mattered was there was a mind, and so a *real* selective agency making a decision on beauty. The act was real, and so the aesthetic purposiveness of form *for* the faculty of taste was real. Yet, selective teleology was founded on the contingent conjuncture between several teleological and dysteleological orders, and so the argument that Darwin deployed to undermine Asa Gray's natural theological transmutation had the effect of undermining the attempt, *pace* Kingsley, to make sexual selection into the vehicle of aesthetic design. Although variations are not random considered absolutely, bound, as they are, to a rigorous efficient causal law, they remain random relative to the rationality of selective agency. There was no divine artist creating the form they found beautiful, and, where, going on the 'many injurious deviations of structure' implied by innate variability, it had become impossible for Darwin to believe that 'each particular variation was from the beginning of all time preordained,' there was likewise no unfurling of a similarly 'preordained' aesthetic design through the sexual selective agency of animals.⁶⁴⁶ Beauty was like other kinds of dysteleological form in that it was only conceivable beyond the regulative teleology of utility and implied an efficient causal nexus, but also radically distinctive, because it broached a teleological dimension that no other natural forms possessed. Indeed, the morphological constraint of form, the 'free play of the various laws of growth,' was made part of a teleological nexus.⁶⁴⁷

⁶⁴⁶ *Variation*, II, p. 432.

⁶⁴⁷ *Origin*, p. 177.

CROE, once a theory of divine design, was now rethought as the making purposive of accidentally beautiful form through iterative generations of selection as the purposeless purpose of beauty *sensu stricto*.

Coda

Argusianus argus – Looking in Every Direction

At some point in the early 1760s, the botanist and collector John Fothergill (1712-1780) was sent the astonishing skin of a bird by a contact in Canton [Guangzhou]. In the March of 1765 the ornithologist George Edwards (1694-1773) read a paper to the royal society detailing this hitherto unknown species, entitled ‘A Description of a Beautiful Chinese Pheasant.’⁶⁴⁸ Although Edwards doesn’t mention where it came from, the name was apparently already set – the Argus –, so called for what was ‘most extraordinary’ about the specimen: the ‘beautiful eyes’ that marked its plumage; ‘eyes and spots beyond description.’⁶⁴⁹ This strange new bird was thereafter swiftly included in the twelfth edition of Linnaeus’ *Systema Naturæ* (1766), and, its celebrity growing, featured in Buffon’s *Histoire Naturelle des Oiseaux* in 1772.⁶⁵⁰ From the outset, the naturalists, colonialists and travellers of the late eighteenth century were captured by the specifically aesthetic qualities of the Argus, marked down in the 1780s by William Marsden as ‘the famous Sumatran or Argos pheasant, of which no complete specimen has been hitherto seen in Europe, [...] a bird of most uncommon magnificence and beauty; the plumage being perhaps the most rich, without any mixture of gaudiness, of all the feathered race.’⁶⁵¹ Until the beginning of the nineteenth century, the same handful of original descriptions – notably Edwards and Marsden – were traded between texts as so many fragmentary specimens of witness testimony, but, with a growing number of bird skins returning from Asia, the Argus was taken up by Cuvier and his English translators, led Temminck into descriptive paroxysms, and, later in the century, left the ornithological writers Jardine and Selby similarly reaching to the topos of inexpressibility, where ‘to describe in words with any degree of precision the various markings of the male, would be almost impossible.’⁶⁵² Even in 1922, with the self-professed arrival of the first major scientific

⁶⁴⁸ George Edwards, ‘A Description of a Beautiful Chinese Pheasant,’ *Philosophical Transactions of the Royal Society*, 55 (1765), pp. 88-90.

⁶⁴⁹ Ibid.

⁶⁵⁰ Linnaeus, *Systema Naturæ*, 3 vols (Stockholm: Laurentius Salvius, 1766-68), I, p.272; Buffon, *Histoire Naturelle des Oiseaux*, 18 vols (Paris: l’imprimerie Royale, 1770-85), IV, p. 110.

⁶⁵¹ William Marsden, *The History of Sumatra*, 2nd edn (London: the Author, 1784), p.97.

⁶⁵² *Animal Kingdom*; Temminck; William Jardine and Prideaux Selby, *Illustrations of Ornithology*, 4 vols (London: Lizars, 1825-43), IV, ‘*Argus giganteus*’.

monograph on the *Phasianidae* for fifty years, the rift between ‘utility’ and ‘beauty’ was rehearsed once more as it characterised the form of the Argus, with the ornithologist William Beebe lavishing aesthetic praise on its plumage as ‘marvels of design and shading [...] with highlights as exquisite and effective as if carefully planned for some delicate purpose.’⁶⁵³

Whether plugged into the discursive realms of colonial travel, physico-theology or twentieth-century scientific prose, the Argus was notable not only because it was always somehow aesthetic, but because this aesthetic significance became essential to its being. What began with descriptions aiming to capture a beauty beyond linguistic capacity swiftly pivoted to the description of the Argus as an aesthetic artefact produced by Nature or God. The history of the Argus tracks the shift from the observation of beauty, to bewilderment at beauty (Temminck), to reaching for explanations of beauty as a purposive excess to purpose; whether in the aesthetics of design, or, ultimately, Darwin’s enshrining of aesthetic purposelessness as an immanent teleology within the world. Argyll’s seizure of the Argus in the *Reign of Law* was just one more move in this longer-term trajectory, and so too was Darwin’s appropriation of the Argus as a way of preserving this same beauty within a new theoretical framework. As Darwin phrased it, ‘the case of the male Argus pheasant is eminently interesting, because it affords good evidence that the most refined beauty may serve as a charm for the female, and for no other purpose.’⁶⁵⁴ The Argus pheasant has meant much for modern histories of *Descent*, sexual selection and Darwin’s theory of beauty, anatomised – to name but a handful already cited – by Julia Voss, Johnathan Smith, Jane Munro and Evelleen Richards. The display feathers of the male Argus were the *ne plus ultra* example for the explanatory power of sexual selection, where, in Johnathan Smith’s words, ‘this case is to the *Descent* what his evolutionary explanation of the eye is to the *Origin* – the application of his theories to a seemingly impossible case.’⁶⁵⁵ Yet, if so much attention has been given to the role of the Argus in *Descent*, not least how Darwin seized this example from the *Reign of Law*, the Argus presents a fitting image for how much is still missing in our knowledge of Darwin’s aesthetics; not only its relationship to its past, but in its expression through *Descent*.

⁶⁵³ William Beebe, *A Monograph of the Pheasants*, 4 vols (London: Witherby, 1918-1922) IV, pp.120 and 113.

⁶⁵⁴ *Descent*, II, p.92.

⁶⁵⁵ Smith, p.132.

Given all these detailed reconstructions of how Darwin came to use the Argus, it is not so much the concrete history of Darwin's appropriation of this example that needs tweaking, but the theoretical model by which we try and understand what he was seeking to achieve – both in the structure of the natural theological aesthetics Darwin derived his own from, as well as the structure of the theory that the Argus was taken to instantiate. The easiest way to make this clear is by briefly examining Julia Voss' account of Darwin's use of the Argus, which has focussed on Darwin's ambiguous deployment of 'chance' in the production of Argus' ocelli, detailing how the moral of the story was, for Darwin, that such form was only possible through the 'interaction of the forces that combine to produce evolution: chance variation and continuous selection.'⁶⁵⁶ Certainly, Darwin's explanation gestured towards the account he had developed in *Variation* (as in his letter to Kingsley), arguing that although such 'ornaments [were] formed through the selection of many successive variations, not one of which was originally intended to produce the ball-and-socket effect,' such contingent variation related to selection in such a way that 'no one, I presume, will attribute the shading [...] to chance.'⁶⁵⁷ Although the production of form might seem 'as incredible, as that one of Raphael's Madonnas should have been formed by the selection of chance daubs of paint,' it was only in the relationship between these two distinctive causal orders that it was possible to explain aesthetic purposiveness naturalistically.⁶⁵⁸ On the back of this double explanation, Voss has asserted Darwin's theory 'traced the breakdown of natural theology and teleology.'⁶⁵⁹

Yet, what Darwin did to explain the Argus was neither simply trading on 'chance variation,' abandoning teleology, nor, in any straightforward manner, eliminating the argument of natural theological aesthetics. Darwin cleaved to the real aesthetic purposiveness of the form of the Argus – stating, as categorically as possible, that any suggestion that this form was aesthetically 'purposeless [...] is a conclusion which I for once will never admit.'⁶⁶⁰ Moreover, chance only ever had an epistemic signification in Darwin's work, referring to our ignorance regarding the efficient causal basis of the laws of, *inter alia*, inheritance, development and variation, but never doubting that these phenomena were

⁶⁵⁶ Voss, p.177.

⁶⁵⁷ *Descent*, II, p.141.

⁶⁵⁸ *Ibid.*, II, pp.141-2.

⁶⁵⁹ Voss, p.178.

⁶⁶⁰ *Descent*, II, p. 93.

strictly determined (at a non-selective order of structure) by lawful and regular material processes. By developing beauty in terms of a teleological apparatus of selection, the chance adaptation – itself strictly determined by efficient causal law – interacted with selection through the contingent conjuncture of multiple causal orders, thereby representing the *morphological constraint* by which sexual selection could then operate. Where it was these ‘laws of growth’ that determined a shift in form before it became aesthetically purposive, selection was entrained to a second, non-teleological order, and so Darwin’s real teleology of sexual selection always implied a link or conjuncture with a second causal mechanism. Darwin did not abandon the teleology of design wholesale, but made it multiplicitous, complex, and immanent to the world. In the form of the Argus, we see the theory that Darwin developed by about 1868 in response to Argyll’s critique and Kingsley’s appropriation of sexual selection. Darwin preserved the central preoccupations and relational structure of natural theological theories of beauty (the many attempts to resolve the antinomies of aesthetic sense and association, adaptive function and morphology) and used its resources to *save* a teleological account of beauty, one which enfolded not chance, but efficient causal processes of morphological or developmental constraints, into a real beauty as purposiveness for aesthetic sense (CROE).

Nowhere is this pattern of thought, and its relation to the history of natural theological aesthetics, clearer than in a reference Darwin made to Argyll in the first edition of *Descent*. The claim that variety for the sake of itself was an aesthetic goal within design, recurring in many of the accounts I have discussed across this thesis, was itself seized upon by Darwin as he found it in the works of Argyll to shore up the explanatory reach of sexual selection. Where Argyll wrote that he was ‘more and more convinced that variety, mere variety, must be admitted to be an object and aim in Nature,’ Darwin sardonically claimed that he was ‘glad to have the unusual satisfaction of following for even a short distance in his footsteps.’⁶⁶¹ Yet, in line with beauty, what mattered about this ‘aim in Nature’ was who it was intended for. Darwin’s question was the same that had arisen in his correspondence with Lyell in 1865, with Darwin now publicly pondering ‘what [Argyll] here means by Nature. Is it meant that the Creator of the universe ordained diversified results for His own satisfaction, or for that of

⁶⁶¹ Ibid., p. 230. Argyll, ‘On Mr Wallace’s Theory of Birds’ Nests,’ *The Journal of Travel and Natural History*, 1 (1868), pp. 276-287 (p.286).

man? The former notion seems to me as much wanting in due reverence as the latter in probability.’⁶⁶² For Darwin, the ‘more fitting explanation’ must be sought in the ‘taste’ of ‘birds themselves,’ a taste produced by its own internal dynamics as a third causal mechanism only contingently related *to the objects it selects*.⁶⁶³ Given its antagonistic tone, and Darwin’s sense – perhaps – that the spectre of the aesthetics of design was finally exorcised, this passage was removed from the second edition text of *Descent*. However, the fundamental point remained: mere variety, and the sheer diversity of forms encountered in the natural world, could have its own mode of explanation as a real purposeless purpose. As with beauty, a real teleology of variety (that other index of the fatal doctrine in the *Origin*) was now directed against design, with its very inessentiality relative to any rationality of functional ends framed as a theological vice in those who brandished aesthetic design against utility. The faults in the natural theological tradition – the very faults that had been transferred to Darwin’s theory and subsequently used to critique it – were now ranged by Darwin against this same theory. A strange dialectic: not only was utility banished from the domain of the divine, but the purposelessness of aesthetic form, beholden to no end but itself, had become an irreverence.

In this thesis I have anatomised how the theoretical shifts of nineteenth century natural theological aesthetics were, in turn, played out during a critical window in the development of Darwin’s thought. Although deliberately limited in its scope, I hope that my analysis of Darwin’s thought in the ten years or so from the *Origin* to the period of composition of *Descent* itself represents a useful crossroads, opening new paths – and new theoretical vistas – in several directions. Four appear most obvious to me. First and foremost, by allowing us to rethink Darwin’s aesthetic teleology as the conjuncture between three distinctive causal elements, the account I have given in this thesis strikes me as strong *prima facie* evidence that there is much to be said for rereading Darwin’s theory of beauty more generally in the terms provided by natural theological authors. A full history of Darwin’s aesthetic theory remains to be written, but rethinking *Descent* – and sexual selection – in terms of this multiple teleology, allows us to problematise any account of sexual selection as *the* explanation Darwin gave for beauty. Likewise, the analysis I have provided throughout

⁶⁶² *Descent*, II, p. 231.

⁶⁶³ *Ibid.*, II, p. 231.

this thesis provides a way of trying to evade the temptation of immediately turning to Kant to understand any question of aesthetic teleology. As I discussed in the introduction, the reflex of many authors, whether Menninghaus, Levine or Duncan, has been to grasp for Kant to illuminate Darwinian aesthetic teleology, but, as I hope to have proved by omission as much as argument, we don't need Kant to understand Darwin's aesthetic teleology; we need authors like Hutcheson, Paley, Macculloch or Kingsley. Indeed, rereading this tradition of largely obscured texts provides a new way to understand aesthetic teleology in nineteenth century beyond the Kantian legacy. There was a distinctive current of teleologically centred aesthetic sense theory in nineteenth century British writing, with figures such as Whewell offering Darwin the resources he needed to think a progressive adaptive teleology as compatible with the aesthetic dysteleology that might otherwise undercut natural selection. The innate capacities of the mind, including the pleasures of the aesthetic faculty, grow with the shifting forms of the world.

Looking backwards from this window of time (1800-1870), where my narrative has represented an intellectual microhistory of how natural theological aesthetics was worked out in the specific context of Darwin, by trying to characterise what is distinctive and important about that theory of beauty – correspondency and CROE – I hope to have offered some preliminary resources for rethinking far wider questions within the history of modern aesthetics. Beyond Kant and nineteenth-century aesthetic teleology, rethinking the role of natural theological discourse in the history of aesthetics represents another of the broader interests my analysis might hold. From physico-theological figures such as Walter Charleton, or Boyle, through to the aesthetic sense theory of Hutcheson or Kames, the resources are there to pursue not just the genealogy of natural theological aesthetics as it would one day shape Darwin's theory, but the deep relationship a natural theological account of the mutual adaptation of sensorium and world had with the development of modern aesthetics as such. A renewed appreciation of natural theological theories of beauty might not be a mere addendum to our history of aesthetics, but provide a way of rethinking some of its foundational aspects, in both texts that might otherwise have been ignored as irrelevant, but equally in such canonical works as Hutcheson's *Inquiry*.

Finally, looking forward in historical time, the resources I have developed in this thesis provide new ways to understand claims of beauty in nature beyond Darwin. The enduring importance of Darwin's engagement with natural theological aesthetics stretched on, not just

in *Descent* and in the evolutionary-physiological theories proposed by figures such as Grant Allen or George Romanes (or, more remotely, in the development of present-day evolutionary aesthetics), but registered strongly even in the case of dissenters against selective or adaptive explanations for any aesthetics of natural form.⁶⁶⁴ Here, the figure of D'Arcy Wentworth Thompson (1860-1948) is instructive, especially as his overarching doubts regarding the power of evolutionary explanations foregrounds how we might understand the continuing legacy of Darwinian aesthetics (and its discontents) as grounded in the tension or interaction between morphological constraint and selective teleology in the production of form. In his *On Growth and Form*, Thompson pitched the question of beauty in terms of the overarching division between his morphogenetic and mathematical conceptualisation of organic structure, with that of the adaptive.⁶⁶⁵ As Thompson put it, the 'zoologist [...] has been slow, where the physiologist has long been eager, to invoke the aid of the physical or mathematical sciences; and the reasons for this difference lie deep, and in part are rooted in old traditions. The zoologist has scarce begun to dream of defining, in mathematical language, even the simpler organic forms.'⁶⁶⁶ For Thompson this 'old habit' of thought, and its resistance to the mathematisation of morphology, was linked to teleological explanation, a golden thread running from Aristotle, to natural theology, and finally to Darwin, in whom 'we have reached a "teleology" without a τέλος.'⁶⁶⁷ This was not, however, just teleological explanation indifferently, but a distinctive aesthetic founded within teleological explanation, where 'above all, in things both great and small, the naturalist is rightfully impressed, and finally engrossed, by the peculiar beauty which is manifested in apparent fitness or "adaptation,"—the flower for the bee, the berry for the bird.'⁶⁶⁸ The very examples that Darwin himself would propose for biosemiotic beauty, and would make their mark on figures such as Grant Allen, were recycled by Thompson to underline their apparent limitation. This professional attitude, which was an epistemic bias as well as an aesthetic vision, was contrasted with the vision of beauty to which it was blind – a morphogenetic, geometric and mathematical image of the

⁶⁶⁴ For some recent works in this hotly contested domain, see Richard Prum, *The Evolution of Beauty* (New York: Doubleday, 2017); Menninghaus, *Aesthetics After Darwin*. For some sense of the criticism Prum (and the return to Darwin) has received within contemporary evolutionary biology, see, for instance, G. Patricelli, E. Hebets and T. Mendelson, 'Review of *The Evolution of Beauty*,' *Evolution*, 73 (2018), 115-124.

⁶⁶⁵ D'Arcy Wentworth Thompson, *On Growth and Form* (Cambridge: Cambridge University Press, 1917).

⁶⁶⁶ *Ibid.*, p. 2.

⁶⁶⁷ *Ibid.*, pp. 2 and 5.

⁶⁶⁸ *Ibid.*, p. 3.

living being – in which ‘the harmony of the world is made manifest in Form and Number, and the heart and soul and all the poetry of Natural Philosophy are embodied in the concept of mathematical beauty.’⁶⁶⁹

So far, so simple, but Thompson also offered a rather Delphic addendum to this profession of mathematical truth or beauty, noting that it followed from the concept of mathematical beauty, that it was its very beauty – pitched against a teleological understanding – that somehow *revealed mathematical form as teleologically functional*, where ‘the perfection of mathematical beauty is such [...] that whatsoever is most beautiful and regular is also found to be most useful and excellent.’⁶⁷⁰ Was the higher perspective of the physiologist capable of enfolding within itself the habit of thought and aesthetic predispositions of the ‘zoologist’ as they had looked to beauty in the adaptation? But was the mathematical or morphogenetic itself thus a boundless resource adapted to be infinitely adaptable? It seemed, more than sixty years later, that the tropes of morphology against teleology, and the “higher order” adaptation of Owen or Whewell, were playing out once more. How though, during this celebration of the universal mathematical language of living form, to explain that other nagging fact, of what beauty was, and what the perception of beauty was? How to make sense of beauty, when surely even the mathematical form we registered as beautiful would have to receive its designation, intrinsically or extrinsically, from a living being with a faculty somehow developed to receive it?

Thompson offered very little in the way of explanation, but, as many had done before him, turned to that most aesthetic of animals – the Argus. The Argus was brandished by Thompson as a way of illuminating how his approach to form could be differentiated from that of Darwin, but in doing so undid the very careful distinctions Darwin had drawn between intrinsic aesthetic purposiveness and the accidentally aesthetic form of laws of growth. Where Thompson saw banded pigmentation and colour gradients in crystallisation patterns as a way of making sense of how such form might be produced, he set this ‘chemico-physical’ model against ‘Darwin’s well-known disquisition on the ocellar pattern of the feathers of the Argus Pheasant, as a result of sexual selection [...] in striking contrast to this or to any other direct physical explanation.’⁶⁷¹ Against any explanation of the Argus ‘ascribed to the

⁶⁶⁹ Ibid., p. 779.

⁶⁷⁰ Ibid., p. 779.

⁶⁷¹ Ibid., pp. 430-1.

unquestioned prevalence of vanity in the one sex and wantonness in the other,' Thompson looked for 'direct physical explanation.'⁶⁷² But there was Thompson's mistake, and the same mistake than many others have made. Darwin had never argued that 'sexual selection' in isolation from 'direct physical explanation' produced the form of the Argus pheasant. Darwin was, in his own way, trying to work out the same process as Thompson regarding the generation of organic form, but did so by developing a model that could comprehend the interaction of multiple causalities as they produced living structures. In this sense, Darwin's teleology was immeasurably more sophisticated than Thompson grasped, because he was trying to simultaneously think beauty as extrinsic form produced by mathematical, biological, or chemical law, *as well* as beauty as an intrinsic purposiveness that defeated the claim of design. In the same way that Whewell had tried to synthesise morphology with teleology through a divine aesthetic rationality, Darwin was trying to think the teleological and dystelological together through the play of a morphological constraint and selective agency immanent to the world itself. Thompson's criticism reveals both the explanatory power of Darwin's multiple teleologies, but also how quickly these subtleties were apparent lost. Wherever we seek to understand the beauty of natural form – whether as immanent end, functional success, or accident of ontogenetic law – there is a role for these dynamics.

⁶⁷² Ibid., p. 671.

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