EYESIGHT WITH INSIGHT: COSMOLOGY AND SECOND-PERSON INSPIRATION

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INTRODUCTION

The story of the origin of the cosmos, as re-told in an influential early science fiction novel by Olaf Stapleton, includes the following lines:

> Then the Star Maker said, "Let there be light." And there was light. From all the coincident and punctual centres of power, light leapt and blazed.[1]

Stapleton's novel, written in 1937, clearly alludes both to Genesis 1:3 and to a new theory of cosmology proposed only a decade previously by a Catholic priest and physicist, Fr Georges Lemaître.[2] This theory, now known as the 'Big Bang', describes the observable universe in terms of an ongoing expansion from a hot and compact state of pure radiation, an account that clearly resonated, for Stapleton and many of his contemporaries, with the text of Genesis.

This pattern of cosmic expansion, from which the term Big Bang derives, raises the obvious questions of why and from what did the expansion originate. Extrapolating back in time, the pattern of expansion also suggests, but cannot prove, a beginning of the cosmos (or at least *this* cosmos). Nevertheless, at every point in space and time at which physical theories can be formulated, there is always *some*thing and never *no*thing, even if the something is described in terms of potential such as a quantum field.[3] Similarly, the text of Genesis, prior to the "Let there be light" statement, does not describe a state of absolute nothingness but a formless void with the Spirit of God moving over the face of the waters (Genesis 1:2). Hence the scientific and scriptural narratives to which Stapleton alludes do not begin with nothing but with a state of undifferentiated potential and a first-created state of light or pure radiation from which a vast and differentiated complexity unfolds.

Since Genesis and contemporary science do not begin with nothing, one cannot make simple and direct links with the doctrine of *creatio ex nihilo*. Nevertheless, the doctrine did develop at least in part out of the ancient scriptural texts, and the contemporary account of the cosmos exploding

virtually out of a point was seen as consistent enough with the doctrine of *creatio ex nihilo* for Lemaître's theory to be condemned in the Soviet Union for 'encouraging clericalism'.[4] One reason for the perceived consonance may be the fact that the primordial states in both the scientific and scriptural accounts lack differentiation into determinate things: a state of being that is not nothing but is also 'no things', albeit rich with the potential to generate things. So upon closer examination modern cosmology, the beginning of Genesis, and the doctrine of *creatio ex nihilo* are interwoven in subtle and suggestive ways, even if not in an immediate and simplistic manner.

This chapter explores another way in which the doctrine, the scripture and modern cosmology are interwoven. *Creatio ex nihilo* did not develop in isolation from other teaching or merely to satisfy intellectual speculation. The doctrine is embedded within a larger theological framework of salvation, notably the principle of a covenant.[5] In a manner distinct from the classical conceptions of God in ancient philosophy, this covenant is founded on second-person relatedness with God, as 'I' to 'thou', culminating in divine love or friendship. The question I address in this chapter is how this relationship, at least in principle, may have shaped perception of the cosmos and may be a fruitful context within which to gained new insights. I begin by considering what is meant by insight in ordinary human contexts and the role played by second persons in accelerating insight.

INSIGHT INTO INSIGHT

Whatever the precise relationship between the doctrine of *creatio ex nihilo* and the accounts of creation in Genesis, it is clear that the world of theological discourse about creation is remote from that of current scientific discourse about the early conditions of the observable universe. Theology employs literary genres, whereas papers that follow the conventions of contemporary physics, replete with equations and references to 'space-time', 'redshifts', 'Hubble parameters', and so on, usually epitomise a Cartesian ideal of clear and distinct mathematical laws and categories.

Nevertheless, progress in physics as it is described in papers tends to be rather different from how scientific insight actually works. By the time physics is written up, the formal records have largely been purged of fruitful and fruitless ideas, hunches, inspirations, and so on. In other words, physics as it is reported is an activity that has largely been purged of those judgments of reason that cannot be expressed in mathematical terms. Not only is the story of discovery thereby incomplete but the

role of powerful but implicit narratives and influences on the context of theories, such as the notion of space-time as a background, are also overlooked, even when they ought to be challenged.[6]

Even the more prosaic steps of scientific cosmology often rely on intellectual operations that are not strictly justifiable by rational or empirical means. Consider, for instance, Edwin Hubble's famous plot of galactic distance versus recessional velocity.[7] A person who has some familiarity with normal scientific practice 'sees' the relationship as more or less a straight line. This linear, proportional relationship between distance and recessional velocity is one of the major pieces of evidence for continuing cosmic expansion from an initial, compact state, now called the 'Big Bang'.

As has been investigated many times under the heading of 'the problem of induction', however, there is something deeply mysterious about 'seeing' an underlying, simple relationship in a scatter of data points, however fruitful this interpretation proves to be.[8] Of course, it is possible to program a computer to find the best fit, but the programmed criteria for success still require a personal judgment based on heuristic guidelines. One such guideline is the presumption of underlying simplicity in the cosmos, a presumption that is not strictly justifiable by rational or empirical means. More subtly, even the objects of empirical study that are modelled as points on a plot, such as galaxies in this case, themselves have to be identified as things that can be placed within a single category, as opposed to being mere patterns of light and dark registered by the pixels of a camera. The intellectual ability to grasp something as a 'thing' is deeply mysterious, and not readily explicable from the empirical data and laws of science. As one consequence, the human eye and mind are often superior to computer programs for identifying galaxies in starfields.[9]

Whether seeing a group of bright pixels *as* an object, a plot of points *as* a geometric relationship with some random scatter, or the entire universe in one's imagination *as* an ordered whole, such changes do not involve the acquisition of new data. The existing data are instead seen with 'new eyes', the very wording of this phrase reflecting the need to resort to strongly evocative metaphors to describe a change in understanding.[10] Such transformations are often given names that denote one or more aspects of their most dramatic instances, such as 'epiphany moments', the German '*aha-erlebnis*' (literally, an 'aha! moment') and, of course, the 'eureka effect' after Archimedes.[11] Accounts of these transformations often also refer to their suddenness, a new ease in solving a problem, positive affect, and a feeling of confidence in being right, although it should also be noted that the more basic and commonplace operations of insight, such as seeing a group of bright pixels

as an galaxy, may happen without conscious reflection or reaction.[12] Given the widespread use of metaphors of unveiling, illumination or sight to describe such operations, I refer to the phenomenon that is the main focus of this chapter by the term 'insight'. As the examples above imply, whatever can be gleaned from eyesight also requires the help of insight, including in cosmology.

Insight, which is also called an 'act of understanding'[13] (or more precisely the transition to a new understanding), is clearly indispensable for many of the most significant advances in knowledge. Nevertheless, insight itself remains mysterious and frustratingly resistant to direct study. It is impossible to model insights, which are not the conclusions of arguments,[14] by means of arguments,[15] or to analyse their discrete steps, given their all-at-once quality. Such difficulties are sometimes disguised by the expedient of masking the contribution of insight. For example, the precision of fine-tuning arguments plausibly makes them attractive, at least in part, due to the status of quantitative arguments as the 'gold standard' of epistemological value today. Yet quantitative precision often obscures the fact that a judgement is still needed, even if the judgment is 'obvious' that there has been a systematic deviation from randomness, as opposed to a remarkable statistical fluctuation.[16] In other words, these cases also require insight, not deduction, to reach the conclusion that God (or something fulfilling a God-like role with respect to the cosmos) is playing with loaded dice. These analytical limitations are compounded by the fact that insights cannot be generated at will and their arrival is not reliably predictable. Instead, insights are often received in a gift-like way, and those who are interested in promoting or studying insights have to resort to heuristic guidelines without guarantee of success, like trying to conduct experiments on lightning.[17]

There are, however, indirect approaches, such as contrasting before-and-after states, possible neural concomitants, and social conditions that promote insights. In particular, although some insights are acquired in social isolation, their quality and rate of acquisition can be increased dramatically in certain social settings. Indeed, good teaching is largely about catalysing insights, thereby vastly accelerating understanding by others, and plausibly also forming their intellectual dispositions to understand.[18] Theology, as it has developed in Christianity from its Jewish roots, has largely been about relating to God as to a person or to the Trinity of divine persons. Hence it is important to examine more familiar contexts to see how one person can catalyse insights in another. On this basis, it may then be possible to examine how purported personal interaction with a personal God might be expected to modify human understanding, including understanding of the cosmos.

AUSTEN AND AUTISM

For a perceptive account of how a good teacher catalyses insights, consider the following passage from Jane Austen's *Mansfield Park*,

> Kept back as she [Fanny] was by everybody else, his [Edmund's] single support could not bring her forward; but his attentions were otherwise of the highest importance in assisting the improvement of her mind, and extending its pleasures. He knew her to be clever, to have a quick apprehension as well as good sense, and a fondness for reading, which, properly directed, must be an education in itself. Miss Lee taught her French, and heard her read the daily portion of history; but he recommended the books which charmed her leisure hours, he encouraged her taste, and corrected her judgment: he made reading useful by talking to her of what she read, and heightened its attraction by judicious praise. In return for such services she loved him better than anybody in the world except William: her heart was divided between the two.[19]

The use of phrases like 'recommending books' and 'correcting judgment' in this text indicate at least some of the ways in which one person may help to catalyse the insights of another. As someone who already 'sees' the world in relatively more advanced ways, the teacher can provide hints, draw attention to key facts, remove distractions, put questions and praise progress towards the goal that the student cannot perceive in advance of its attainment. In such ways, a second person can vastly accelerate understanding by a first person.

Austen, however, draws attention not only to Edmund's skills as a teacher but also to the love that informs the relationship, "*She (Fannie) loved him (Edmund) better than anybody in the world except William: her heart was divided between the two*." This use of terms of affection, combined with the description of Edmund's manner of teaching, provides a hint that the effect of his teaching involves more than communication of what is reducible to objective information, expressed as propositions. According to Austen, interpersonal relatedness plays an important role.[20]

What kind of interpersonal relatedness is conducive to this communication? The situation that Austen describes, involving mutual personal presence, is one that has attracted much interest from psychologists and social neuroscientists in recent decades, with many studies emphasising that much of what is communicated is not easily reducible to propositions. Consider, for example, one of the most simple of all such modes of communication, namely the action of pointing something out to someone in a situation of mutual personal presence. Even this simple action, without words, communicates understanding by abstracting an object from the background of the visual field and

indicating to another person that the object is worthy of attention. Moreover, this action is accompanied by at least a momentary shared awareness of shared attention with the other person, often also with a shared 'stance' or attitude towards the object of attention.[21]

Although seemingly commonplace, pointing has been described as one of the keys by which an infant begins to unlock the meaning of the world,[22] such actions being instances of a broader range of phenomena called 'joint attention' or 'second-person relatedness'.[23] At a more complex level, the extended dialogue of a teacher and student in a situation of second-person relatedness will often involve the sharing of a complex pattern of stances towards diverse matters, not only by explicit speech (such as pointing out useful books), but also by prosody, non-verbal communication and a variety of other means.[24] Such exchanges may help to trigger insights, rather as the revelation of fragments of a picture from a new and hitherto unknown perspective may suddenly be interpolated into a whole image from that perspective. Another and possibly complementary way of thinking about this process might be that of two systems coming into harmony and thereby sharing similar cognitive capacities. Whatever the precise means, understanding that is gained from another and shared with another in this context of joint attention could be called *second-person understanding*.

Given the success of teaching at accelerating insights, it seems plausible that there is such a thing as second-person understanding, specifically in the context of 'I'-'you' relatedness. Nevertheless, given the wide range of other means of communication and possible causes of insights, it is not straightforward to test this hypothesis. One possibility is to examine situations in which second-person relatedness is atypical and to examine whether there are any unusual and concomitant impacts on a person's capacity to understand. Of the range of such conditions, autistic spectrum disorder (ASD) is especially important for these studies. A person with severe ASD is sometimes described as not seeing persons,[25] although careful studies in fact suggest that ASD does not involve a lack of third-person recognition of a person, i.e. as a special kind of object in the world. What is missing or inhibited, rather, is second-person relatedness, as of 'I' to 'you'. This absence is corroborated by the frequent association of ASD with the phenomenon of 'pronoun reversal', by which a person makes mistakes in using the correct grammatical forms for second persons.[26] Hence, if second-person relatedness does indeed contribute to the development of understanding of all kinds of matters, including cosmology, then the expectation is that those with ASD will have difficulties in understanding or perhaps have atypical ways of understanding the world.

Is this correlation found in practice? A properly justified response would be a major project in itself, and there would be a need to try to isolate the direct impact of second-person relatedness on understanding with effects that may be due to other factors associated with ASD. Nevertheless, under a variety of terms going back to Kanner's original description of autism,[27] research suggests that there is indeed a correlation with atypical patterns of understanding. To give a few of many examples, those with ASD often focus on local features instead of global patterns,[28] suggesting a difficulty in turning many 'trees' into a single 'forest' within which the trees stand.[29] Another commonly reported difficulty is being overwhelmed in social situations or crowded places, consonant with an inability to group and set aside details.[30] Other difficulties include a failure to consolidate learning over time and poor predictive abilities, such as a failure to anticipate picking-up by parents and the timing of air puffs to eyes,[31] as well as difficulties in grasping the intentions conveyed by social cues.[32] All these symptoms can be interpreted as an undeveloped capacity to understand, insofar as they involve difficulties in relating parts to wholes, or grasping the underlying regularities of the world, or in comprehending the intentions of others. On the other hand, by way of compensation, it should be noted that those with ASD may display superior performance on local tasks, including reduced contextual modulation or interference.[33]

These many findings suggest that an inability to engage in joint attention or second-person relatedness also inhibits one of the most common ways in which human persons acquire insights in the context of relating to others, and perhaps also the dispositions to acquire insights. Conversely, teaching by a second person in the context of joint attention can vastly accelerate the rate and quality of the acquisition of insights by a first person. Hence the role of a second person in teaching is not simply as a source of information that is reducible, in principle, to the communication of objective propositions. There is a growing body of evidence in support of the view that shared awareness of shared focus, in the manner of joint attention or second-person relatedness, plays a critically important role in communicating understanding and encouraging the development of the faculty of understanding. This connection between second-person relatedness and the development of understanding is one reason, I suggest, why an impersonal computer cannot replace a personal teacher, or that a child cannot learn language simply by watching videos.[34]

SECOND-PERSON INSPIRATION

What are the implications of second-person understanding for a theologically-informed cosmology, in particular, the impact on understanding the cosmos when second-person relatedness is with a divine rather than a human person? Within the context of classical philosophy, the notion of a relationship between God and human beings that could be described as 'second-personal' is uncommon to the point of non-existence. Although Aristotle refers to God in the third person, he does not address God as a second person and even denies that it is possible to be friends with God.[35]

Nevertheless, the account drawn from natural philosophy is not, of course, the whole story of purported human interactions with God. A central theme in the history of the Jewish people (taken up and transfigured by Christianity) is the notion of a covenant with God. The use of terms pertaining to marriage as metaphors for covenants, as well as adultery for breaking them, underlines that they are to be understood in what would today be called second-personal terms, as 'I' to 'you'.[36] In the Book of Job, however, a covenant has been made but is not yet wholly efficacious. This separation from God is correlated, according to the Book of Job, with limitations of human understanding as seen, for example, in the following passage from chapter 38,

> Where were you when I laid the foundations of the earth? Tell me, if you have understanding. Who determined its measurements? Surely you know! Or who stretched the line upon it? To what were its foundations fastened? Or who laid its cornerstone, when the morning stars sang together, and all the sons of God shouted for joy?[37]

In this passage, God communicates with Job, but principally to underline how Job does not understand the cosmos. Moreover, there is a sense that Job, representing natural human perfection, is still cut off from understanding God's interactions with other beings, including the sons of God, the drops of dew (v. 28), the belt of Orion (v. 31), and young lions (v. 38), to whom God relates in a remarkably intimate way. One can gain the impression from the text that there is a kind of playful intimacy between God and creation from which humanity is self-excluded.

Consider, by contrast, the following passage taken from one of the earliest Christian documents outside the New Testament. This text is the work of someone whose whole life revolves around the perception of a new covenant with God revealed in the Incarnation, a life in which human beings

have themselves received the grace of adoption as children of God, with the gift of the Holy Spirit and the promise of seeing the face of God,

> The heavens, revolving under his government, are subject to him in peace. Day and night run the course appointed by him, in no wise hindering each other. The sun and moon, with the companies of the stars, roll on in harmony according to his command, within their prescribed limits, and without any deviation. The fruitful earth, according to his will, brings forth food in abundance, at the proper seasons, for man and beast and all the living beings upon it, never hesitating, nor changing any of the ordinances which he has fixed.[38]

What is striking in this second passage is the calm confidence of the writer, who perceives order and harmony from the largest to the smallest beings, under the authority of God who has become known. The cosmos is not perceived as an accidental assemblage, or the operation of some vast, impersonal mechanism, or the work of an unknowable or only partly known divinity (or divinities). On the contrary, this second-person relatedness to God is accompanied by a new understanding of the cosmos as harmonious, law-like, and potentially knowable. Whatever the veracity of the theological claims, one can plausibly attribute a new cultural confidence to this change of perspective, a confidence to uncover this cosmic order with an expectation of success.

Later theological development put this distinction on a systematic basis. The state of second-person relatedness to God, as described in Augustine's *Confessions*,[39] was classified as a 'supernatural' *life of grace*. This relation is absent from the Aristotelian *life of nature*, and which could be thought of, in contemporary terms, as spiritually autistic from the perspective of grace.[40] Later theological developments also assigned a distinction of two kinds of dispositions (*habitus*) of understanding (*intellectus*): the intellectual virtue that human beings have by nature;[41] and, in the life of grace, a new kind of understanding that is a gift of the Holy Spirit.[42] In the work of Thomas Aquinas, all these gifts, including understanding, are interpreted as dispositions enabling what would today be called 'joint attention' with God, by which human beings are moved, out of love, to love with God the things that God loves.[43] So theology already has a place reserved for a special kind of understanding that a person gains specifically in the context of second-person relatedness with God, as opposed to other possible sources of revelation, such as words carved into tablets of stone. This account dovetails well with all kinds of stories in which someone suddenly sees the world from a new perspective, not changed visibly, but grasped with a new understanding in the perceived presence of a divine person.[44] One might call such insight 'second-person inspiration'.

Faced with this claim, however, a sceptic would rightly demand whether these purported second-person inspirations have effects that can be discerned by a third person. In other words, besides first-person experiences, attitudes to creation, and theology itself, is there really any observable and significant change in the way that the natural world is understood as a result of such inspirations?

I suggest that the answer is 'yes'. The evidence for this claim can be seen in a sequence of famous representations of nature that more or less track the decline in the cultural and artistic importance of second-person relatedness to God. Starting with Van Eyck, *The Ghent Altarpiece* or *The Adoration of the Mystic Lamb* (1432), one sees what is arguably the most theologically perfect symbolic painting of the kingdom of heaven that art has ever attempted. A theme of this image is that the focus on the perfection of the divine life of grace, centered on the divine liturgy, is accompanied by the perfection of nature. In the transition from Van Eyck to Joachim Patinir, *The Penitence of St Jerome* (c. 1518), there is, however, a diminishment of the life of grace in comparison to nature, indicated by the small figure of St Jerome in the foreground and the large landscape in the background. This transition is continued with the obscured church in the background of Pieter Bruegel the Elder, *The Harvesters* (1565), and is complete in wholly natural focus of Constable, *The Hay Wain* (1821). A few decades later, however, Van Gogh, *Wheatfield with Crows* (1890) has a road going nowhere, a compressed vertical dimension, and blurred creatures. Finally, in the work of Jackson Pollock, *Enchanted Forest* (1947), there are no discernable features left. Without making a judgment about the comparative value of these works, what is striking is the way in which the loss of second-person relatedness to God, as a first principle of art, artists and the broader culture, has been followed by an extraordinary decline in the ordered perception of the world.

While those working in physical cosmology today might regard such cultural changes with equanimity, I suggest that art is playing the role of the proverbial canary in the mine, or possibly the dead bird suffocated by an early air pump in the famous painting by Joseph Wright in 1768. The loss of perceived second-person relatedness with God has already had a profound impact on art and may eventually have an impact on science, including cosmology. Lest this claim seem fanciful, it should be noted that some recent influential studies have suggested that much of intellectual life, including that of the hard sciences, is already suffering the effects of the changes anticipated by art. These effects include a paucity of new insights, a loss of coherence and fragmentation,[45] which has also been characterised in terms of an eclipsed right-hemisphere cognition of the world.[46] If this

trend continues, the loss of the influence of the theological context that gave rise to the doctrine of *creatio ex nihilo* will presage a more general and widespread cultural descent into nihilism.

FUTURE INSIGHTS

The conclusion that we understand the cosmos in ways that are strongly influenced by our theology is scarcely new and has been explored with great subtlety from at least the time of Wisdom's 'Parable of the Garden'.[47] What is less widely recognised, I believe, is the way in which this understanding is not only shaped by the knowledge of certain things about God as Creator, but the perception of relating to God as to a second person in the context of a covenant, the ground also of the doctrine of *creatio ex nihilo*. Whatever the precise explanation, it is this relationship that seems to be associated with a cultural confidence for seeing the cosmos as harmonious, law-like, and potentially knowable. Conversely, there is evidence that the decline of a sense of second-person relatedness with God has been associated with a loss of a sense of coherence in nature.

How then can we best hope to accelerate our insights into creation in future? In the case of ordinary insights from other human persons, a good strategy can be to get out more, to spend time mixing with colleagues in other fields, and to listen respectfully and learn from those with different perspectives and expertise.[48] Faced with the sometimes dreary earnestness of the modern academy, there is a great need to re-discover the value of intellectual play, especially in dialogue with others, to break the ice of frozen representations that forms so quickly over one's cognition of the world. [49]

Perhaps something similar may be said about the need to spend time with God. After all, if there is a God who created the cosmos, and who desires a covenant with human beings, then God is unlikely to be a passive player in the relationship. On the contrary, covenant is enriched by shared understanding, so God will presumably want to accelerate the insights of human persons, including insights into the created cosmos as a whole. As in the case of communicating insights between human persons, the acceleration and communication of these insights is likely to arise principally in the context of lives and cultures that are infused with a strong sense of an 'I'–'you' relationship with God. The practices that cultivate this sense of communion include the assimilation of divinely revealed narratives, sacraments, liturgies, sacred art and perhaps, via harmonisation on a subliminal level, sacred music. Above all and in the spirit of a noetic version of Pascal's wager, in which one seeks understanding by venturing a standpoint of faith, one needs to pray.[50]

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1 Olaf Stapledon, Star Maker (London: Methuen & co. ltd., 1937), chap. 13.3.

2 Georges Lemaître, 'Un Univers Homogène de Masse Constante et de Rayon Croissant Rendant Compte de La Vitesse Radiale Des Nébuleuses Extra-Galactiques', *Annales de La Société Scientifique de Bruxelles*, 47A (1927), 49–59. For a history of the work of Georges Lemaître and its reception, see Helge Kragh, *Cosmology and Controversy* (Princeton University Press, 1999).

3 There are many reasons why the Big Bang does not lead directly to the notion of a true beginning of the cosmos, not least the problem that all possible clocks are absorbed into the initial singularity. More generally, the Big Bang, insofar as it can be expressed as a scientific theory, can only describe how some created things become other created things, and not how things come to be in an absolute sense.

4 Helge Kragh, *Cosmology and Controversy* (Princeton University Press, 1999), p. 262.

[5] Justin Stratis, 'Unconditional Love: Creatio Ex Nihilo and the Covenant of Grace', in *Theological Theology*, ed. by R. David Nelson, Darren Sarisky, and Justin Stratis (London ; New York: Bloomsbury 3PL, 2015), pp. 277–88 (p. 286).

[6] For a detailed study of some of the current mysteries and problems regarding progress in physics, see, for example, Lee Smolin, *The Trouble with Physics: The Rise of String Theory, The Fall of a Science, and What Comes Next* (New York: Houghton Mifflin Harcourt, 2006). One theme of the book is the failure to examine background assumptions, such as the treatment of space-time as an invariant background to phenomena.

[7] Edwin Hubble, 'A Relation between Distance and Radial Velocity among Extra-Galactic Nebulae', *Proceedings of the National Academy of Sciences*, 15.3 (1929), 168–73 (fig. 1) <https://doi.org/10.1073/pnas.15.3.168>.

[8] The 'problem' of induction, made famous by the epistemological framework of David Hume, *An Enquiry Concerning Human Understanding*, Oxford World's Classics (Oxford: Oxford University Press, 2007), chap. 4., is another way of expressing the discontinuity between what can be achieved by discursive reasoning and insight. The connection between induction and insight is made, for example, in Bernard J. F. Lonergan, *Insight: A Study of Human Understanding*, ed. by Frederick E. Crowe and Robert M. Doran, The Collected Works of Bernard Lonergan, 5th edition, revised and augmented (Toronto: Published by University of Toronto Press for Lonergan Research Institute of Regis College, 1988), III, p. 313.

[9] See, for example, 'Galaxy Zoo' <http://www.galaxyzoo.org/> [accessed 31 October 2015]. This project involves the public in helping to classify galaxies, on the basis of the reliability and flexibility of the human ability to grasp a pattern of bright pixels as a galaxy, across an extraordinarily wide variety of irregular shapes.

[10] Hence those studying insight have also taken a particular interest in psychology, especially *gestalt* psychology. See Ludwig Wittgenstein, *Philosophical Investigations*, trans. by G. E. M. Anscombe (New York: Macmillan, 1953), pt. II.xi.

[11] Pioneering work on the 'aha! moment', as an 'inner illumination', was carried out by Karl Bühler, cf. The Mental Development of the Child, a Summary of Modern Psychological Theory, trans. by O. A. Oeser, International Library of Psychology, Philosophy, and Scientific Method Y (London: Kegan Paul, Trench, Trübner, 1930), chap. 14. See also Pamela M. Auble and others, 'Effort toward Comprehension: Elaboration or "aha"?', *Memory & Cognition*, 7.6 (1979), 426–34. The term 'epiphany' to describe such moments is from the Greek epiphaneia, meaning 'manifestation' or 'striking appearance', a word made famous by the account of the wise men finding the child Jesus in the Gospel of Matthew 2:1-11. The term was adapted to a more secular context in literature principally by the work of James Joyce; see, for example, Zack Bowen, 'Joyce and the Epiphany Concept: A New Approach', *Journal of Modern Literature*, 9.1 (1981), 103–14.

[12] Sascha Topolinski and Rolf Reber, 'Gaining Insight Into the "Aha" Experience', *Current Directions in Psychological Science*, 19.6 (2010), 402–5.

[13] The notion that insight is experienced as a new presentation of the world, rather than a manipulation of pre-existing representations, is consonant with its other characteristics. For example, the word 'insight' and other visual metaphors associated with the phenomenon, like the exclamation 'I see,' imply the immediate and all-at-once cognition of something new. Moreover, this 'seeing' with the mind is often closely associated with the perception of an object, with the eyes or in the imagination. It is plausible, for instance, that what provoked the famous "Eureka!" of Archimedes was not immediate knowledge of the steps required to solve the problem, the details of which were presumably elucidated later, but 'seeing' the solution implicitly and inchoately by seeing the water rising up the side of the bath.

[14] For such reasons among others, it has proved impossible to program any kind of computer to generate insights, a major frustration to efforts to create artificial intelligence. For an account of the problems that insight presents to the challenge of artificial intelligence, see, for example, Stuart Shanker, *Wittgenstein's Remarks on the Foundations of AI* (London: Routledge, 1998), chap. 4. This distinction between discursive reasoning, associated with the manipulation of representations of the world, and insights, associated with new presentations of the world, parallels a widely observed asymmetry in the typical operations of the two hemispheres of the brain. Iain McGilchrist has compiled a vast body of evidence that supports the position that use of the left-hemisphere (LH) of the brain is biased toward the use of existing representations and models of the world, of the analysis of parts rather than the perception of wholes, and of linear, sequential arguments. By contrast, the use of right-hemisphere (RH) is more closely associated with *gestalt* perception, new presentations, and metaphor, by which words carry over into embodied experience. See especially chapter two of Iain McGilchrist, *The Master and His Emissary: The Divided Brain and the Making of the Western World* (New Haven; London: Yale University Press, 2009). Insight

has been associated specifically with RH activation, mainly the right anterior temporal area, specifically in the right anterior superior temporal gyrus. Where high levels of restructuring are required, there is also activity in the right prefrontal cortex. See Edward M. Bowden and Mark Jung-Beeman, 'Aha! Insight Experience Correlates with Solution Activation in the Right Hemisphere', *Psychonomic Bulletin & Review*, 10.3 (2003), 730–37. John Kounios and others, 'The Origins of Insight in Resting-State Brain Activity', *Neuropsychologia*, 46.1 (2008), 281–91. Simone Sandkühler and Joydeep Bhattacharya, 'Deconstructing Insight: EEG Correlates of Insightful Problem Solving', *PLoS ONE*, 3.1 (2008), e1459.

15 True insights may even undermine previous, apparently consistent arguments. Galileo's challenge to geocentrism was arguably a case of a true insight raising problems lacking immediate solution; cf. Paul Feyerabend, *Against Method*, Updated ed. / new introduction by Ian Hacking. (London: Verso, 2010).

16 I am thinking here of the following scenario. If I roll one, two or even three straight sixes in a game, you would probably just consider that I am lucky. If I roll a hundred sixes in succession, you would almost certainly judge that I am playing with a loaded dice. Yet even a million sixes in succession would violate no physical laws, even for a perfect dice, and one cannot create a precise mathematical rule, based on the number of sixes rolled in succession, for reaching the conclusion that the dice is loaded. Regardless of the apparent mathematical nature of the problem, a human judgment is required, as is also the case for so-called 'fine-tuning' arguments in cosmology.

17 Rule-of-thumb recommendations include attending to connections, coincidences and curiosities, investigating contradictions, and "creating breakthrough solutions through the force of desperation," according to Gary Klein, *Everything That Follows Is Different: The Disruptive Power of Insight* (New York: PublicAffairs,U.S., 2013).

18 "Teaching is a vast acceleration of the process of learning. It throws out the clues, the pointed hints, that lead to insights; it cajoles attention to remove the distracting images that obstruct them; it puts the further questions that reveal the need of further insights to complement and modify and transform the acquired stores…," Lonergan, III, p. 315.

19 Jane Austen, *Mansfield Park*, ed. James Kinsley, Oxford World's Classics (Oxford; New York: Oxford University Press, 2003), 18.

20 I use the term 'relatedness' rather than 'relation' or 'relationship' as the latter words convey an intimacy or familiarity that may not be present in all pertinent cases. I am grateful to Peter Hobson for making this point to me.

21 By 'stance' I mean what Eleonore Stump has described as a "conative attitude prompted by the mind's understanding"; cf. Eleonore Stump, 'The Non-Aristotelian Character of Aquinas's Ethics: Aquinas on the Passions', *Faith and Philosophy*, 28.1 (2011), 29–43 (p. 41).

22 Clara Claiborne Park, *The Siege: The First Eight Years of an Autistic Child (With an Epilogue, Fifteen Years After)* (Boston, London: Little, Brown and Company, 1982), p. 6.

23 *Joint Attention: Communication and Other Minds: Issues in Philosophy and Psychology*, ed. by Naomi Eilan and others (Oxford: Clarendon Press, 2005). I explore the close connection, to the point of interchangeability, between 'joint attention' and 'second-person relatedness' in Andrew Pinsent, *The Second-Person Perspective in Aquinas's Ethics: Virtues and Gifts* (New York; Abingdon, UK: Routledge, 2012), pp. 47–49.

24 There is a vast literature on these matters, the emphasis of which is the need to think about language not simply in terms of objective symbol use and organization, but as a communicative interaction between persons. See, for example, John T. Nusbaum, 'Language and Communication', in *The Oxford Handbook of Social Neuroscience*, ed. by Jean Decety and John T. Cacioppo, 1st edn (Oxford University Press, USA, 2011), pp. 668–79.

25 Park, p. 93.

26 I describe this connection between autistic spectrum disorder (ASD) and lack of second-person relatedness in Pinsent, *The Second Person Perspective in Aquinas's Ethics*, chap. 2.

27 Leo Kanner, 'Autistic Disturbances of Affective Contact', *Nerv. Child*, 2 (1943), 217–50.

28 See, for example, Uta Frith and Francesca Happé, 'Autism: Beyond "theory of Mind"', *Cognition*, 50.1–3 (1994), 115–32; Simon Baron-Cohen, 'The Extreme Male Brain Theory of Autism', *Trends in Cognitive Sciences*, 6.6 (2002), 248–54; Francesca Happé and Uta Frith, 'The Weak Coherence Account: Detail-Focused Cognitive Style in Autism Spectrum Disorders', *Journal of Autism and Developmental Disorders*, 36.1 (2006), 5–25.

[29] Ning Qian and Richard M. Lipkin, 'A Learning-Style Theory for Understanding Autistic Behaviors', *Frontiers in Human Neuroscience*, 5.77 (2011) <https://doi.org/10.3389/fnhum.2011.00077>. See also Temple Grandin, *Thinking in Pictures: And Other Reports from My Life with Autism*, 2nd ed. (London: Bloomsbury, 2006).

[30] John Elder Robison, *Be Different: Adventures of a Free-Range Aspergian with Practical Advice for Aspergians, Misfits, Families & Teachers* (New York: Crown Archetype, 2011).

[31] Kanner; Lonnie L. Sears, Peter R. Finn and Joseph E. Steinmetz, 'Abnormal Classical Eye-Blink Conditioning in Autism', *Journal of Autism and Developmental Disorders*, 24.6 (1994), 737–51.

[32] Courtenay Frazier Norbury, Helen Griffiths and Kate Nation, 'Sound before Meaning: Word Learning in Autistic Disorders', *Neuropsychologia*, 48.14 (2010), 4012–19 (p. 4013).

[33] See again, for example, Frith and Happé; Baron-Cohen; Happé and Frith.

[34] Many studies have highlighted the importance of social interaction to language acquisition. See, for example, Kathy Hirsh-Pasek Sarah Roseberry, 'Skype Me! Socially Contingent Interactions Help Toddlers Learn Language', *Child Development*, 85.3 (2013) <https://doi.org/10.1111/cdev.12166>.

[35] *Nicomachean Ethics* (*EN*) 8.7.1158b36–1159a3

[36] See, for example: Isaiah 54:5; Jeremiah 3:20; Ezekiel 16:15–19; and especially the book of Hosea, in which the adultery of the prophet's wife, Gomer, signifies the sin of the children of Israel (Hosea 2:2–5; 3:1–5; 9:1) in breaking their covenant with God; in the New Testament see, for example, James 4:4–5. Note that many cultural and religious practices in these traditions also serve to encourage, express or defend the notion of second-person relatedness with God in the manner of a covenant. For example, the notion of a covenant is central to much liturgy and sacrifice, and one can also point to the extensive use of narratives in sacred texts, the unique literary genre that communicates a sense of knowing a person, as well as the emphasis on the face in Christian art, following the Incarnation.

[37] Job 38:4-7. I have used the New King James translation.

[38] The translation is from James Donaldson and Alexander Roberts, eds., *The Apostolic Fathers with Justin Martyr and Irenaeus*, vol. I, Ante-Nicene Christian Library: Translations of the Writings of the Fathers down to A.D. 325 (Edinburgh: T&T Clark, 1867).

[39] See, for example, Augustine, *Confessions* 10.27.38.

[40] The phrase 'spiritual autism' should, of course, be read as a metaphor, just as 'spiritual blindness' has long been a metaphor in theological discourse, without implying that the corporeally blind are spiritually inhibited. As I have argued in detail in Pinsent, *The Second Person Perspective in Aquinas's Ethics*., especially chapter 2, the vast systematic description of this life of grace developed by Thomas Aquinas is not only organised around divine friendship but has, as its root metaphor, the notion of being moved by God in a second-person way, comparable to shared awareness of shared focus with a human person. So one of the most influential and most detailed articulations of the meaning of the life of grace has as its core principle the notion of second-person relatedness with God, a condition in which the innate 'spiritual autism' of the post-lapsarian human condition is dispelled.

[41] Aquinas, *Summa theologiae* (*ST*) 1-2.57.2.

[42] The gift of understanding, in contrast to the homonymous virtue of understanding, is described in *ST* 2-2.8. According to Aquinas, all the infused virtues and gifts have the form of divine love (*caritas*) or friendship; cf. *ST* 2-2.23.8.

[43] See Pinsent, *The Second Person Perspective in Aquinas's Ethics*, chap. 2.

[44] As a description of what such moments are like, see, for example, C. S. (Clive Staples) Lewis, *That Hideous Strength: A Modern Fairy-Tale for Grown-Ups* (London: Bodley Head, 1945), p. 395.

[45] See, for example, Smolin. See also McGilchrist.

[46] See McGilchrist.

[47] J. Wisdom, 'Gods', *Proceedings of the Aristotelian Society*, New Series, 45 (1944), 185–206.

[48] Cf. Alex Pentland, *Social Physics: How Social Networks Can Make Us Smarter*, Reissue edition (New York, NY: Penguin Books, 2015), pp. 26–27, "The most consistently creative and insightful people are explorers. They spend

an enormous amount of time seeking out new people and different ideas, without necessarily trying very hard to find the 'best' people or the 'best' ideas. Instead, they seek out people with *different* views and *different* ideas."

[49] This situation is depicted in Hans Christian Andersen's *The Snow Queen*, in which the boy Kai is trapped in the Snow Queen's palace where he endlessly re-arranges blocks of ice. In the story, he is unable to escape until the love and tears of his childhood friend Gerta dissolve the indifference of his heart, and his eyes are opened to new understanding. For a translation, see, for example, H. C. (Hans Christian) Andersen, *The Complete Fairy Tales and Stories*, trans. by Erik Christian Haugaard (London: Victor Gollancz, 1974). For an analysis, see Andrew Pinsent, 'Special Divine Insight: Escaping the Snow Queen's Palace', *European Journal for Philosophy of Religion*, 7.4 (2015).

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