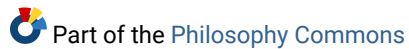


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Can Neuroscientific Studies Be of Personal Value?

Andy Mullins

Abstract: This essay reflects on the ability of neuroscientific data to be of personal value and to enrich our lives by offering insight into our capacities for self management and choice. The theory of cognitive dualism proposed by Roger Scruton seeks to preserve rationality and allow for freedom of will, but he appears reluctant to engage with the data accruing in neural studies. I contrast this approach with a Thomistic hylomorphic approach to the philosophy of mind that is founded on participation in being. It offers the potential to draw on neurobiological knowledge for insights into rationality, motivation, and *eudaimonia*. The role of neural development in *eudaimonia* is considered and the benefits of a Thomistic hylomorphism founded on participation in *esse* are summarized.

Two apparently contradictory positions defy reconciliation in contemporary philosophy of mind: determinism, which would appear to be inherent to neurobiological processes, given their physical basis, and claims that human beings (with some constraints) enjoy freedom of choice.

Many approach this issue by denying one or the other, whether by arguing that materialism does not exclude freedom of choice or by denying that human beings are in fact free at all. Others adopt some form of compatibilism in which determinism and freedom of will are reframed as non-contradictory. For example, neuro-scientist Christof Koch suggests that human beings have the capacity to follow desires that are determined by chemical programming.¹ In his view, we can "do what we will but not will what we do," as Schopenhauer put it.²

Arguably a more subtle and philosophically satisfying approach has been adopted by Roger Scruton in his recent writing on cognitive dualism.³ In contrast with reductive physicalist approaches that deny agency and responsibility, he suggests that the free and rational actions of a human person are of an order distinct from neurobiological laws and that discussion of them should not be confused. The subjective and the objective must not be mixed. Yet the cost of this position is that the personal subject is disconnected from its organic life. The evident interdependence of the somatic and the psychological is left undiscussed. For these reasons, cognitive dualism appears *prima facie* to be scientifically unsatisfying.

In this paper I suggest that a Thomistic hylomorphism founded on a metaphysics of participation offers an alternative approach that is philosophically coherent and scientifically satisfying. I suggest that

such a philosophical framework supports an understanding of *eudaimonia* that manifests itself in the biophysical sphere and in the choices that we make as they bring about permanent neurobiological changes that become the substrate of our character, personalities, and (to a real degree) our prospects for happiness. Our very peace of heart is dependent upon the changes that occur in our neurobiology through our habitual choices. In its proposal of a participated and embodied rationality, Thomistichylomorphism addresses constructively one of the more intractable dilemmas of contemporary philosophy of mind.

Neural Characteristics of Apparently Moral Behavior

Over the past twenty-five years an increasing weight of studies that have been made possible by new, non-invasive imaging techniques allow us to argue that it is possible to identify specific areas, pathways, systems, and mechanisms in the brain that, at the neural level, appear to support moral behavior. Functional magnetic resonance imaging (fMRI) has revolutionized our capacity to peer into the workings of the brain in real time when used in association with other scanning techniques such as positron emission tomography (PET). In the past decade diffusion tensor imaging (DTI) has increased greatly our understanding of neural pathways.⁴ These imaging advances have allowed more precise temporal and spatial identification of brain areas implicated in specific processes than has ever been possible before. They have led to a surge in understanding of plasticity in the brain, of localized functionalities, of the complex contribution of deep brain regions, of connectivities, and of the scale

of cortical networking and integration of systems and areas that are implicated in the executive function and in tasks of information processing.

The implications for a greater understanding of human behavior are far reaching. A 2010 gathering of experts concluded:

The methods of brain and cognitive sciences have reached a stage such that we can now objectively monitor the developmental trajectory of the child's brain and document how this trajectory is being shaped by parenting, education, and other environmental influences.⁵

Table 1 draws together certain findings from a dozen authors whose work involves investigations into the neural bases of moral responsibility.⁶ This listing of areas and roles is by no means exhaustive, but it is representative of the complex integration of neural areas that are involved, or to use the more technical word from the literature, *implicated* when moral actions are being performed.

A major challenge, however, is to make sense of this data. To say that a neural region may have a role in supporting moral behavior raises significant questions, not only about the completeness of the scientific data but about the implications for agency, accountability, and moral freedom. The wealth of neural data now becoming available demands an adequate philosophy of mind.

Cognitive Dualism within Contemporary Philosophy of Mind

Noting an evident relationship between behavior and specific neural features and functions, philosophers of mind have typically adopted materialist or dualist responses. If materialist, they opt for either a non-reductive approach that recognizes the reality of non-material phenomena that are proposed to emerge from matter, or for a reductionist approach that espouses a physicalist position (in its more radical forms, irreducibilism or eliminativism). In recent decades, various modified dualist positions draw together the notion of non-reductive emergence with the dualist paradigm.

The pedigree of non-reductive materialism indicates its physicalist roots. One can see this, for example, in the work of C.D. Broad, who held that every substance is wholly made up of the physical, wherein mentality is "an emergent characteristic of certain kinds of material complex."⁷ It is also evident in the arguments of Saul Kripke about the impossibility of statements of strict identity between sensation and physical state⁸ and in the anomalous monism of Donald Davidson, who introduced the notion of supervenience, whereby mental events are caused by and ultimately reducible to physical events.⁹ Non-reductive emergent accounts are the preferred approach in contemporary neuroscience. They take a wide range of forms. For example, Koch adopts a strict compatibilist paradigm while Gazzaniga is more open to free choice of the will,¹⁰ and Greenfield emphasizes personhood.¹¹

The "naturalistic dualism" of David Chalmers proposes that subjective consciousness emerges from the physical but may not be reduced to it.¹²

Chalmers has shown himself to be comfortable in discussions of neuroscience. His meta-reflections on the neural correlates of consciousness are well known.¹³ At the metaphysical level, however, this approach is vulnerable to the charge that, being wholly material, it fails to account for free rational choices.

Roger Scruton adopts a form of subtly modified dualism that is buttressed both against the standard critiques of ontological dualism and against the critiques of materialism. Like Chalmers he adopts an emergentist position. Unlike Chalmers, he avoids all discussion of neuroscience, thus strengthening his position against criticisms like that of Derek Jeffreys, who argues that emergentist positions are tied to physical laws and so are unable to explain free choice of will.¹⁴ His aim appears to present a tight philosophical response to eliminativist and reductivist conceptions. He thus proposes "cognitive dualism" as a reasonable account of mind-body interaction in which "the world can be understood in two incommensurable ways, the way of science, and the way of interpersonal understanding."¹⁵ In the spirit of Ludwig Wittgenstein,¹⁶ he rejects the reductivism prevalent in contemporary science and art and is open to immaterial phenomena. In keeping with the philosophical pedigree of dualism, Scruton appears to place a priority on description over explanation and reveals a certain skepticism about metaphysics: "Nature does not stand in need of a causal explanation, but maybe it stands in need of a reasoned account."¹⁷

"No Place" for Agency and Accountability

Scruton uses the notion of the *Lebenswelt*, the "world of life," as one that co-exists with the world of the physical objects from which it has emerged "as the face emerges from the pigments on the canvas."¹⁸ It is the world of personal experience and thus stands in contrast with the "scientific image" of the world, "the systematic attempt to explain what we observe."¹⁹ Both are views of the same reality but they are incommensurable. One point of view may not be derived from the other: "concepts of agency and accountability...have *no place* in the physical sciences" (my italics).

He thus appears to hold a much more restrictive position in this matter than Chalmers. He avoids all discussion of neuroscience. By saying that there is "no place" in the scientific world of objects for such realities of human experience, it seems that Roger Scruton means not only that the actions of persons may not be ascribed to specific regions or aspects of brain function but that neural features can shed no light on the actions of persons. This is a strong statement indeed.

Yet, ultimately, if presented as something emergent and if understood as seeking to defend human freedom, cognitive dualism finds itself on the horns of dilemma: if the subjective is emergent (and so able to preserve the unity of the human subject), it is difficult to see how determinism can be avoided. On the other hand, once the experiential and subjective is emphasized (so as to sidestep charges of determinism), subjective life is disconnected from relationship with the body and ultimately risks losing a grounding in reality.

At first glance, the notion of emergence would seem to guarantee the

integral unity of a rational subject. Having adopted a dualistic framework in order to defend the interior world of the person, Scruton seeks in the notion of emergence a way to preserve the unity of the human being. By rejecting a metaphysical framework he suggests that the *Lebenswelt* is emergent from the objective world. He ties the subjective to the objective by suggesting that one's *Lebenswelt* embraces also practical reason. Further, he suggests that the subjective and the scientific points of view have only a notional independence from each other: "we have no perspective that allows us to grasp both the subject and the object in a single mental act."²⁰ Simply to assert, however, that experience gives rise to the subjective does not provide an account of emergent rationality. It is one thing for an observer to experience agency, accountability, I-you relationships, and subjective experiences of things like music and religion. These are the focus of Scruton's discussion. But it would seem a different issue altogether to provide a justification for the claim that rationality emerges from physical entities in the first place. Surely it is unreasonable to suggest that matter gives rise to intentionality and rational experience. This would seem to conflate association with causality.

To defend a non-deterministic understanding of human behavior, Scruton suggests that the reality of having a *Lebenswelt* is undeniable, that human beings do have "agency and accountability" for their actions, and that we should accept the mystery of it. Although terms such as "accountability" and "agency" sit well with the language of compatibilism that seeks an accord between free choice of will and material determinism,

Scruton offers a cogent refutation of arguments against human freedom derived from the Libet experiments.²⁰ The problem remains, however, that no account is offered of how rationality comes to exist at the ontological level in the first place. Such an approach would seem to require a closer examination of the distinctive nature of rationality and a reasoned defense of what would seem to be a purely material account of our capacity to form and articulate truth-claims about our convictions and to make choices to love.

Despite the breadth of the argument and elegance of the writing, Roger Scruton's cognitive dualism fails to offer a psychologically satisfying account of the embodied nature of human beings.

The Undeniable Impact of Biology on Rationality

Cognitive dualism appears to disregard the close interrelationship of human behavior and biology. Biology is not destiny, but neither is it disconnected from behavior and the psyche.²¹ Some human beings appear to have the capacity to act more freely than others. An obvious example is found in Mischel's 1972 experiments into delayed gratification. He demonstrated that the human capacity for transcending concrete incentives co-exists in a given population with the all-too-human experience of following one's impulses in the presence of enticing stimuli.²² Human beings are demonstrably capable of acting on the highly constrained motivations of impulse but also on reasoned deliberation and free choice when arriving at their courses of action. Some actions may be impulsive, as in a crime of passion, but it is also possible for actions to be deliberate, such as

in the case of a fear-mastering self-command by a soldier in the face of danger.

The mere apprehension of a certain stimulus can initiate some types of behavior. It can unleash a passion by triggering a biochemical cascade-propelling response. What we do with our bodies, and what happens to them, can influence our mental states. Furthermore, it is clear that our past behaviors influence even unintentional future behaviors, most dramatically in addiction. That this can happen even in the case of *unintended* future patterns of behavior seems to suggest that actions can create some sort of *material* blueprint for future action. Our actions change us as people.

Without question, human rationality operates within **various** constraints. Aristotle observed that the health and age of the body affects intellectual function. We see and think with greater clarity when our bodies are in their prime.²³ All cognitive activity is unconditionally dependent on certain bodily parameters. For example, a loss of oxygen leads to a loss of consciousness and cognitive function. Experiments show time and again that a negative environment can contribute to a negative mood, and vice versa. In a similar way we see that learning is dependent on directed attention, and knowledge on accurate information gathering by the bodily senses.

Neural studies show that illness and impairment in specific brain areas have cognitive consequences. Certain cognitive processes (such as the capacity to plan and to have due regard for consequences) are impaired if there is damage to the *prefrontal cortex*. Also, to take but one example,

vivid memories, powerful emotional responses, and extreme sense input can override activity in this area of the brain, thereby cutting out of the loop circuitry apparently essential for cognitive processes and self management.²⁴ In other words, such biologically founded phenomena can subvert clarity of thought. An anthropology that assists our understanding of the place of these realities within the human psyche has the potential to enrich our capacity to manage our organic constitutions.

The Importance of Emotion to Rational Decision-Making

Roger Scruton presents the relationship between biology and rationality as inscrutable. The text below appears to argue that biological basis of human life has little relevance to rational choices:

First-person awareness and practical reason (the giving and taking of reasons for action) are the forces that shape the human person. These forces are, I maintain, unaffected by the proof that our actions, thoughts, and perceptions are dependent on a vast machinery of brain processes of which we are not aware.²⁵

The hylomorphic view, by contrast, is that it is more accurate to describe the relationship between brain and self-shaping motivation as one of subtle *interdependence*.

Emotion is not independent of cognition and goal setting. Encouragement and emotional affirmation help children learn.²⁶ Emotions can assist rational decision-making, for emotions are at the core of human

motivation. Interpersonal decision-making is enriched with the emotional contributions of compassion, kindness, affection, and emotional empathy. Medications can enhance personal freedom not only by making us well so that we can refocus our attention, but by direct effect on the brain systems mediating our psychological balance. Anti-depressant and bipolar medications can assist a person to function with greater self-management.

In any case, rationality and human freedom are not exercised only in an absolute manner or not at all. All too often we simply are not as free as we might like to think because of some somatic factors, conditions in our neurobiology, implicit biases, established habits and even unrecognized addictions that draw our choices in particular directions. Consider Aron's experiments that demonstrated how eye contact and personal conversation can exert a subliminal influence on the relationships into which we choose to enter.²⁷ Or consider David Perrett's experiments with morphed faces as showing that we are involuntarily drawn to those who look like ourselves.²⁸

There is always a biochemical component to human behavior. What we are attracted to, either as a sensible stimulus or as a conviction, makes its presence felt in our reward expectations. We act also according to conditioned (or self-conditioned) responses to the fearful or difficult. Furthermore, some hormones dispose us for certain kinds of behavior, while others drag us along. Our genetic makeup too, including our temperament, can serve to set the limits for our behavior. Consider a person who is pathologically shy. These things can affect personal agency and responsibility.

Furthermore, our choices change us biologically, not only in gross ways such as through alcohol abuse but also in more subtle changes over time. We can, for example, become more goal-oriented. We can condition ourselves to be less susceptible to impulsive responses to the stimuli associated with previous conditioning. Man has the potential to be a "being whose main concern consists in fulfilling a meaning and in actualizing values, rather than in the mere gratification and satisfaction of drives and instincts," taught Viktor Frankl. As human beings, we have a limited capacity to become the person that our choices dispose us to be or that we wish to be.

Perhaps most importantly of all, our choices to love anything are integrated with our bodily responses of feeling and emotion. Human convictions lead to choices to love and can be enriched by them. These choices require the integration and enrichment of emotion into the cognitive. An adequate philosophical psychology (for example, Aristotle's vision of virtue-based *eudaimonia*) can assist in discussion of these matters.

To overlook the close relationship between the subjective and the somatic not only contradicts human experience, but (taken to its logical conclusion) leads to the loss of the unity of the personal subject. Agency and an emergentist paradigm appear contradictory.

Participation, a Key to Embodied Rationality

Descartes proposed the notion that matter and spirit, body and mind, are irreconcilable realities (separate substances) that are somehow

causally interactive. By contrast, hylomorphism rejects the substance-dualism typical of Descartes but nonetheless takes a dual-aspect model for understanding matter and spirit to differ in degree in their degree of perfection of being. Non-material properties adhere together with material properties in a single substance. Aristotelian hylomorphism presents an enriched understanding of substance in which form is the principle of being, function, and structure. Reflecting on the contingency of living things in comparison with non-living things, Aristotle argued that when a living entity dies, a point is reached when its principle of organic unity is lost and the entity decomposes into constituent chemicals. He postulated that there must be a principle of organic unity in every living thing and taught that this life principle of *non-human* living things is emergent from the lower levels of organization in the matter out of which they are composed.

He argued, however, that the distinctiveness of the qualities of human beings means that in human beings this life principle cannot be emergent. Human life exhibits the capacity for knowing and willing, and these operations, although carried out by embodied beings, possess an immateriality that is dependent upon an immaterial principle. He called the non-material principle operative in this case a rational soul.²⁹ Since it exhibits a capacity for immateriality, he concluded that there is reason to think that the human soul must in some way continue to exist after death.

Thomistic hylomorphism goes much further. Aquinas's texts have been variously interpreted, but the reading that is of particular interest here is that by Cornelio Fabro and those who have developed his line of thought.

Following closely the texts of Aquinas and in alignment with commentary of Banez,³⁰ Fabro demonstrated that Aquinas was able to explain how the animated human person is of a different order from any other living or non-living thing. He integrated an Aristotelian understanding of act, potency, and form with a modified neo-platonic account of participation. Fabro stressed Aquinas's arguments for the primacy of *esse* as act and of participated being as a participation in *ipsum esse subsistens* when he wrote: "That which has existence but is not existence is a being by participation."³¹ It is in this insight that Fabro **sees** the originality of Aquinas:

In contrast with the Neoplatonic concordism, [Aquinas] presents an entirely new concept and principle: it is the concept of *esse* as *actus essendi*, not to be confused with the *existentia* of Augustinianism and of rationalism.³²

For Fabro, Aquinas succeeded in providing a reasoned account of being in an evidently contingent universe.

A simple argument for participated being is as follows. The contingent nature of all the beings around us, including human beings, requires there to be a *bestowed* (since it cannot be emergent) principle for human existence that is able to account for human activities that transcend matter. For non-human contingent being, for which natural activities do not transcend matter, this principle may be emergent; this principle cannot be something that emerges from the matter in the case of human beings, for if it did,

we would be entirely determined by our material organization and there could be no such thing as free choice. It must be intrinsic to the human being and not be a substance separate from the body for this would be to surrender the unity of the human being as a single subject. The needed principle must be one that can animate a body but also make possible activities that transcend the body, for there is need to explain how it empowers the body to live as well as to conduct operations that by their nature are beyond the capacity of the physical, namely, the rational operations of grasping the truth about things and of choosing on the basis of perceived truth (not merely on the basis of sensation). Because this principle may not emerge, the only possibility is that it be a principle of being that is bestowed. This principle is the human soul, and by means of this principle, the human being participates in being and rationality.

We might consider such a participation to be in some small way analogous to the "participation" of a dictionary in truth, or a sunset in beauty, a participation not in a thing, but in some way in reality itself. Just as a book cannot **account for** the truth of its own content, human biology cannot account for its own rationality and capacity for non-tangible choices in regard to love.

In contrast to the line of thought preferred by such contemporary Thomist philosophers of mind as Edward Feser and James Madden, who emphasize only formal causality in their explanations of the hylomorphic view of substance, the notion of participation requires a robust role for efficient causality.³³ Fabro alludes to the need for efficient causality in this way:

To the Platonic doctrine of participation based on imitation and transcendence, Aristotle opposed the *immanence* of the form in sensible substances and the *causality* of the individual singular in the process of natural becoming.³⁴

Bernardo Bazán explains that Aquinas's metaphysics

provides the ultimate foundation of his anthropology, namely, the real distinction between *esse* and *essentia* and the philosophical theory of *creation as causation* of the finite act of being (*esse*) by an Infinite Being (*esse subsistens*).³⁵

In this perspective, the creation of a person occurs at the bestowal of a spiritual (that is, non-material) principle of personhood and being. By re-introducing a focus on efficient causality, the doctrine of participation enters into discussion of precisely the same question that a materialist philosophy of mind tries to address. If we did not do so, we would be comparing the apples of formal causality with the oranges of efficient causality.

As we have seen, cognitive dualism proposes a separation of the subjective realm from the objective or scientific sphere. In contrast, Thomistic hylomorphism starts not with unreconciled viewpoints but with the universal ground of being in which all things participate: "Aquinas introduces his original notion of *esse* as an intensive act that offers the ultimate ground for the doctrine of participation."³⁶ In this way arguments

for a Thomistic notion of ground of being offer a more complete account of the presence of rationality in matter. Feser, among others, emphasize “form” as a key to an understanding of any hylomorphic substance, and rightly so. But it is only through a grasp of participation *in esse* that a more complete understanding of the presence of rationality, in its coming to be, is possible.

When enriched with the Boethian notion of person as agent, Thomistic hylomorphism becomes a powerful tool for understanding human beings. It is a coherent and systematized account that offers the potential to integrate science, psychology, ethics, and social philosophy. In contrast to the Cartesian view that agency derives from the mind alone,³⁷ it proposes that agency resides in the person, the embodied rational substance, for mind is a power, not a substance in itself.³⁸

Hylomorphism and Neural Studies

Advocates of hylomorphism and of materialism, perhaps surprisingly, have much in common. Without a hylomorphic option, physicalists subordinate behavior to brain function. This materialist approach is encapsulated in the view of neuro-scientist Larry Squire: “All of behavior and all of mental life have their origin in the structure and function of the nervous system.”³⁹ Thomistic hylomorphism too grants that all mental activity finds support in biophysical correlates, and insists that it is the person who thinks, by virtue of a capacity for rationality. In this case however, while organic structures support thought processes, they do not fully account for them.

The key point of difference between hylomorphism and non-reductive materialist philosophies of mind lies in the notions of formal causality and most especially of participation. In the hylomorphic view, the soul is the form of the human subject, endowing human nature with participated existence. This single-substance view is capable of incorporating and taking full advantage of scientific knowledge of brain function as a way to give an account of the bodily structures that underpin reasoning, memory, attention, emotion and its regulation, reward expectations, imitative learning, and so much more.

Hylomorphism therefore is fully able to acknowledge the rich psychological and cognitive contribution of emotion, integrating the biophysical and the mental. Neuro-scientist Antonio Damasio suggests a similar integration.⁴² This integration is most evident in hylomorphic commentaries. Nancy Sherman discusses emotions as "forms of intentional awareness."⁴¹ Martha Nussbaum suggests that both emotions and mental activities are "bodily [activities]."⁴⁰ Following on the Aristotelian notion that emotions are themselves neither good nor bad but simply directed towards some object, she rejects any simplistic or negative view of emotions and defines them as "appraisals or value judgments which ascribe to things and persons outside the person's own control great importance for that person's own flourishing."⁴³ She presents a eudaimonistic vision in which "emotions appear to be eudaimonistic, that is, concerned with a person's flourishing."⁴⁴ She also notes that Aristotle regarded pleasure not as a feeling but as unimpeded action.

Hence human flourishing includes the notion of mature biological development, facilitated by the virtue-enabled integration of emotional and cognitive life. Nussbaum points out that Aristotle integrated emotion into the cognitive world of the person, that he viewed pain as "pain at" something, and "as an intentional state with cognitive content."⁴⁵ Indirectly she also suggests that this vision of emotion offers insights into the specific roles of the cardinal virtues and their significance for flourishing. If an emotion is essentially "thought of an object combined with thought of the object's salience or importance," this integrated view suggests the involvement of prudence and justice in every emotional response that is in accord with the good of the person⁴⁶

To a limited extent, cognitive dualism appears to embrace emotional experience as a subjective response to, for instance, music and beauty, but the embodied psychology ofhylomorphism has the capacity to understand better the relationship of the emotional and deliberative domains as well as to grasp the role of emotion in the development of motivation, virtue, and the achievement of *eudaimonia*.

Knowledge about the structure and function of the brain has the capacity to empower us for personal improvement and in the guidance of others. A comparison with the way in which an individual learns to read might be appropriate: although phonics are not the meaning of the words, phonics can help us to learn to read and thus to understand because we grasp the words better by being able to pronounce their building blocks; so too, understanding of neuroscientific elements of rationality -- self-directed brain plasticity, emotion regulation, directed attention, self-directed

conditioning of fear responses and sense desires, development of an expectation of pleasure associated with the good, the true and the beautiful - all assist in self-management, in parenting, and in understanding others.

A clear understanding of the neural bases of the various virtues has the potential to guide goal setting with greater precision for the improvement of character. I would suggest that central to the human constitution at the biophysical level of the virtues of temperance and fortitude is our capacity to condition reward-pathways and fear-responses through repeated choices, vivid emotional experiences, intervention at times of greater sensitivity, and so on. The virtue of justice, as a virtue proper to the rational will, is a disposition to make certain kinds of choice in a way that is informed by convictions about the dignity of other persons and about our duties towards them. **And the neural bases of justice would include preferential neural** pathways of compassionate responsiveness, empathy, and (as is evident in areas of the brain implicated in visualising proposed courses of action) an habitual capacity to consider the impact of one's actions on others. A benefit may also be derived from testing non-empirically derived wisdom about the formation of character **so that it is consistent with, and guided by,** neuro-scientific understandings. For example, the importance of shielding impressionable children from certain influences becomes an even greater priority when we appreciate how neural plasticity is useful for establishing preferential pathways.

Support for the new science of neuropsychology reflects confidence in the research base that explains why cognitive therapies and reconditioning of responses are often effective. Mindfulness about

emotional state enhances self-management. If we understand our metabolism better, for example, by recognizing the debilitating effects of exhaustion or an oncoming panic attack, we can take corrective action with foresight. If we learn to divert our negative emotional blockages, we can act more effectively. So too, if we are aware of the neural systems and processes that need to be in place to build up a strong character and good habits, we can better manage these, direct them, and develop them. For example, the identification of "emotional eating" is now therapeutically recognized in the treatment of obesity. Such therapies affirm the role of the biophysical in motivation and the power of appropriate goal setting to divert impulsive responses. In this way human freedom is recognized in clinical psychology when it notes that increased understanding of brain plasticity confirms that it is our choices that make or break us.

Can knowledge of the neural development of one's child help one to become a better parent? It would seem so. Explanatory knowledge is empowering. For example, family dynamics can be transformed should a ten-year-old's seeming tantrums be correctly re-diagnosed on the Asperger's spectrum, so removing perplexity from a situation and offering strategies and hope to the parents. In the same way the clarity and predictability that comes from a scientific understanding of a situation can offer genuine advantages. Aristotle's own psychological insights were remarkable. He taught that the essence of moral parenting is to raise children to feel joy when experiencing what is good, true, or beautiful, and that they be taught to accept sorrow or pain for the right reasons. In effect, he encouraged parents to condition the reward expectations and

fear responses of their children. Aristotle also insisted that we learn first of all by experience, e.g., by doing. This sits well with what neural plasticity shows us about consolidating neural pathways in order to perform a behavior more regularly. Moral learning calls on the same biophysical laws as potty training.

Nor was the importance of imitation lost on Aristotle. The mirror neuronal mechanisms underpinning a child's capacity to learn emotion, and therefore develop motivations, through imitation of parental emotion are now identified. Mirror neurons are not just cells that mediate subconscious imitative behaviors, even though that would be a great deal. They are also a mechanism for learning emotional responses, a "plausible neural basis" for understanding others.⁴⁷ They enable a child to incorporate in its own emotional life the emotions of the parent, and so they develop templates for motivation: habitual calm in the face of challenges, patience when feeling cross, a smile when meeting a stranger. All this is not wishful thinking but evidence-based parenting. The brain is not, as it were, a black box: we benefit from a knowledge of its workings.

Embodied *Eudaimonia*

The hylomorphic understanding of substance offers insights into the nature of human fulfillment. Such *eudaimonia* has an objective basis and includes the biological development to which we are disposed, the full integration of our neural resources at the service of rationality.

Without the universal ground of participation in being, the door opens to relativism. The argument of Thomistic hylomorphism founded on

participation, is that this approach provides the only sure metaphysical demonstration of *eudaimonia* founded in objective qualities. Participated being offers an understanding of existence-in-reference-to-another whereas an emergent rationality view, adrift from interdependence of being, offers less convincing arguments for objective fulfillment in life. Advocates of emergent rationality such as Roger Scruton or Michael Gazzaniga, are focused only on the functioning entity. Without a common ground of "existence" to which they can appeal, they can only conclude that each human being, detached from all other beings, is free to choose whatever course he or she prefers in life. An objective *eudaimonia* is beyond reach.

But in a universe of participated existence, rational beings discover the purpose in life by knowing themselves as sharers in the life of one who, being the very source of rationality, knows and loves us. The transcendentals of truth and goodness are rooted on the foundational transcendental of being. A recognition that one cannot be fulfilled in isolation is a truth rooted in our participation in being. One is fulfilled by the use of rationality in knowing and loving other persons, and first of all the Loving One who shares being with all creatures and to whom we owe our existence and nature. Even if this goes beyond the conclusions offered by Aquinas, it would appear philosophically defensible on the basis of his doctrine of participation. It is a conclusion reached by Roger Scruton, even though he does not present a metaphysical justification:

If he exists he is a person marked by those features that are essential to personhood, such as self knowledge, freedom, and the sense of right

and wrong. Such a being can love us in his turn. Moreover, God, if he exists, is One, and he is Creator.⁴⁸

In the Aristotelian and Thomistic understanding, virtue is a necessary means for achieving this sort of flourishing. The personal, yet objective, excellence of virtue empowers human beings to reach fulfilment in personal love. But when fulfilment is framed in subjective terms, when relationships with other persons become an optional extra, when unabashed self-interest is the goal, there can be little room for virtue, nor for flourishing; duty to others is implicit both to virtue and virtue-based *eudaimonia*.

A hylomorphic framework can incorporate an account of biological development into the notion of *eudaimonia*. Flourishing necessarily includes flourishing of the brain, for the full and integrated development of one's brain is needed in the mediation of a self-determined life. This biological aptitude for flourishing extends to the neurological domain: the concept of human flourishing should properly include brain development as part of the development to which the organism is biologically predisposed.

It would appear that man's biological aptitude for flourishing is found in his ability to develop to the full his natural powers along the predisposed lines for the development of the human organism. This is also consistent with the view of Aquinas that virtue disposes man to perfection according to his nature.

These lines of predisposed development incorporate the constellation of pathways and mechanisms that underpin virtue development. Hylomorphism

predicts that as virtue develops there is an extensive integration of the neural resources of the person (cognitive, executive, emotional and sensorimotor systems, and pathways facilitating habitual action); an integration that empowers man for rational self-management and necessarily implicit to human flourishing.

Short Selling Hylomorphism

Thomistic hylomorphism has been poorly understood. Nussbaum insists: "attend properly to the appearances"⁴⁹, yet, this Aristotelian principle of close observation of reality has at times been obscured by the squabbling, arcane terminology, interminable sub divisions, and simple misinterpretations of some of its advocates. Descartes and Kant, arguably the greatest influences on modern philosophy received a partial understanding of Aquinas' thought. Descartes' scholastic formation was influenced by the teachings of Suarez,⁵⁰ who disagreed with, or misunderstood, Aquinas' view of participation in being. Suarez presented essence and the act of being merely as conceptual distinctions.⁵¹ And the great influences on Kant were Descartes and Leibniz who himself also drew from Suarez. In Chapter 12 of the *Critique of Pure Reason* Kant stated, "All our knowledge of existence belongs entirely to the sphere of experience".⁵² He argued that existence is not a property: "Being is evidently not a real predicate, that is, a conception of something which is added to the conception of some other thing," he wrote, but without the benefit of considering Aquinas' insights. Kant's view in turn fuelled the

anti-metaphysical analytic stance in the past century.⁵³ One cannot help thinking that the course of Western philosophy could have been somewhat different.

Roger Scruton considers hylomorphism as somewhat sympathetic to his own view:

...if, as Mark Johnston writes in the name of hylomorphism,... the essential nature of an individual thing is given by the concept under which its parts are gathered together in a unity. (Then in the case of a human being...) there are two such unifying concepts - that of the organism and that of the person, each embedded within a conceptual scheme that sets out to explain or understand its subject matter. ... Humans are organised *from their material constituents* (italics mine) in two distinct and incommensurable ways - as animal and person. ... not two separable things, since those two things reside in the same place at the same time, and all the parts of one are also parts of the other.⁵⁴

Yet even this seems to sell hylomorphism short, to reduce it to a philosophy of essences and natures. Aquinas argued that because nature is a descriptor of the proper actions of something of a particular essence, nature is better understood as act than as matter:

For a thing is more properly said to be what it is when it is in act than when it exists only potentially. Form, according to which a thing

is natural in act, is nature more than matter, according to which a thing is something natural in potency.⁵⁵

It is form that "makes something to be what it is", informing of the kind of thing something is. As we have seen, for a living entity, form is not only a bestower of essence but is principle-of-existence-as-this-entity.

Detachment from reality, initiated by the Cartesian revolution, leads to further challenges. Whereas the Aristotelian would argue that final causality is very much able to be discerned by reason, Scruton argues that "The teleological foundation of the world is not perceivable to science, or describable in scientific terms. Hence it can be neither proved nor disproved by scientific method".⁵⁶ He states, "If we mean by final causes the reasons, meanings, and forms of rational accountability that enable us to live as subjects in a communal world, therefore, it is provocative and unfounded to deny that final causes exist".⁵⁷ But surely this approach reduces teleology not to something necessarily real, a consequence of an objective nature, but to interior conviction which ultimately is unreferenced to an external standard of truth.

Scruton encounters a similar dilemma with respect to reasoned proofs of the existence of God. Although Scruton presents a most articulate and graceful argument for subjective acknowledgement of God, he disapproves of the "enormous metaphysical burden that has been placed on God's shoulders by the philosophical attempts to prove his existence".⁵⁸ He argues that "to explain intelligence by means of intelligence (is) to make intelligence inexplicable". But it is questionable whether rational arguments which seek

evidence of order and rationality in creation necessarily seek to explain intelligence itself. Be that as it may, the only course left to cognitive dualism is to reduce knowledge of God to the subjective: "We cannot *think* God but can *love* him".⁵⁹ Elegant but a little disconcerting. Thomistic hylomorphism, at the level of reason, promises more.

It would seem that Aquinas is up against the same challenges today as five hundred years ago when, in the times of the later scholastics, his work was subject to various interpretations and re-presentations. Roger Scruton himself though attracted to much in Thomism, is schooled in different presuppositions about philosophy and human nature:

I always have trouble with the concept of being (being tempted by Kant's view that it is not a concept) and so these Thomistic arguments don't always spark off assent in me. However, I do agree that there is a problem about accounting for rationality and the general difference between man and the other animals, and that in the end we need some kind of teleological metaphysics to make sense of our condition.⁶⁰

How difficult it is for us make sense of our condition without recourse to metaphysics.

The Benefits Of Thomistic Hylomorphism

A Thomistic hylomorphism offers significant benefits in overcoming challenges currently encountered in philosophy of mind:

(1) That all substances participate in being, that there is an ultimate principle of unity, truth and goodness objectively grounds knowledge and *eudaimonia* in reality. A well-articulated hylomorphic account buttresses realism from falling into conceptual relativism because it offers an understanding of how perceptions are grasped objectively: thought is intrinsically related to its object because it shares the same form.⁶¹ A related nagging problem for philosophers of mind has been to offer an understanding for the objectivity of mental representations. Hylomorphic philosophers argue that we possess the object itself in our intellect, a conformity of mind to thing; we do not “perceive visual experiences, we have them” as Putnam independently concludes.⁶²

(2) Thomistic hylomorphism, through its understanding of the rational soul as a principle of participation in the fullness of being, overcomes the arguably insuperable difficulties for the emergent account to accommodate rationality and human freedom.

(3) The dualistic inability of showing how apparently mental phenomena (subjective responses of the person) could possibly cause physical events appears overcome using a hylomorphic framework. With its rich understanding of causality and the distinction it offers between efficient and formal causation, hylomorphism offers a way forward.

(4) A hylomorphic analysis, by focussing on being, avoids both epistemological and metaphysical idealism. Haldane argues, “Contemporary philosophers of mind confirm the persistence of Cartesianism in their preoccupation with the status of qualia”.⁶³ As an embodied rational psychology hylomorphism accounts for the interaction of the psychological

and biological, of the rational and the neural, the subjective and the objective. Without an understanding of substance that integrates the material and non-material as properties, neural explanations for consciousness, intentionality and qualia must remain as mechanistic and deterministic.

(5) Hylomorphism offers an understanding of the nature of persons, and of the metaphysical priority of person over thought and action. The hylomorphic view is that agency resides in persons, in embodied human persons.

(6) The hylomorphic ontology is very much in keeping with, and provides an explanation for, our intuitions of being, our observations of human freedom, of human action and causation, and of teleological motivation. Some resort to dualism to uphold teleological motivation, yet "the dual aspect monism... of hylomorphism will offer the same advantages"⁶⁴ and this without the loss of unity of being. The hylomorphic approach is in keeping with the widespread acceptance of human freedom. The hylomorphic view proposes the eudaimonic fulfilment of persons capacitated for relationships of love through their participation in rationality and being.

Conclusion

In cognitive dualism Roger Scruton offers a highly refined **defense** of the spiritual/subjective realm and an eloquent **defense** of human freedom. He holds that the subjective is emergent from the physical and therefore he

appears to propose what is essentially a materialist understanding of substance, albeit non reductive. Emergence seems a necessary conclusion in the scheme of cognitive dualism so that unity **of the subject** is preserved.

Human rationality however is most evidently grounded in the neurobiological qualities of the person. Our very capacity to grasp reality, and to think clearly, depends on appropriate relationship between our emotional and the cognitive domains. The subjective cannot be successfully cast adrift from the biophysical. By separating biology and psychology, and detaching the subjective from contributing biophysical factors, cognitive dualism struggles to maintain unity of the person, and to offer a view that is both scientifically satisfying and able to guarantee the unity **of the person** that it seeks to preserve. Scruton's approach appears more focused on being as representative of certain categories (such as scientific, and subjective), rather than on being as being itself. Consequently it is unable to reconcile these various categories, or to place them on a unifying ground.

Such an "emergent" solution seems ultimately unable to offer an account of a rationality that embraces the biophysical qualities that are evidently inherent to human nature. However when a way is found, through Thomistic hylomorphism, to view human biological development as intrinsic to **eudaimonia**, then human flourishing, in the full exercise of rationality, is *made possible by* appropriate neurobiological development in our biological constitutions. Where rationality is tied to objective biophysical development, **eudaimonia** itself is accorded an objective basis. This harmonisation of the rational and the biological becomes possible in

a hylomorphic framework.

Table 1. Some Neural Subdivisions Implicated in Moral Behavior.

Neural sub-division	Specific Area	Brod-mann's Area	Role
PFC	Anterior PFC (aPFC) Ventral sectors of PFC Frontopolar cortex	9,10	Active in moral evaluations relying on predicting the long-term outcomes of one's own actions, such as the anticipation of guilt. Active in social-emotional contextual knowledge and learning of learning of moral values. Active in moral judgment .
	Ventro-Medial PFC	9,10, 12,32	Active in adherence to well-established social norms and attitudes. Active in reflection on impact on others. Active in moral judgment .
	Anterior rostral medial prefrontal cortex (Medial PFC)	11,12, 25	Active in social emotional responses, especially in adolescents.
	Medial portion of the superior frontal gyrus, orbitofrontal gyrus and rostral anterior cingulate cortex (Medial PFC)	9,10, 11,32	MPFC active in moral judgment . Active in processing various kinds of self referential information, appraising and coding the self relatedness or self relevance of information. Contribution to representations of specific future events and autobiographical memory retrieval. Active in inference of mental states of others, and in empathy for others in pain, with linkages to anterior ACC and anterior IC.
	Posterior PFC areas	6,9,10, 46,	Active in overlearned sequences.
	Dorso-lateral PFC Mostly right hemisphere.	46	Active in accepting external guidance. Active in moral judgment . Pain and reward processing.

	Right lateral PFC	44,45,46,47	Active in suppression of sexual arousal.
	LPFC	44,45,46,47	Active in suppression of sadness.
OFC	Orbitofrontal cortex (OFC)	11,25	Active in appreciation of moral consequences of behavior and consideration of impact on others.
	Lateral OFC (LOFC)	47	Active in adapting to social-emotional cues.
	Right OFC	47	Active in suppression of sadness.
Cingulate cortex	Anterior cingulate cortex (ACC)	24	Involvement in moral conflict resolution. Active in consideration of impact on others. Pain and pleasure processing.
	Rostral ACC	(peri-genual BA24/BA33; subcallosal BA32/BA25)	Active in empathy with the pain of others.
	Right ACC	23,24	Active in suppression of sexual arousal.
	Posterior cingulate/retrosplenial cortex	23,26	Contributing region to imagination of specific future events and autobiographical memory retrieval. Active especially in females in responses requiring moral sensitivity to others. Active in adult moral judgment , less so in adolescence.
Temporal lobes	Temporal lobes	20,21,22,35,36,38,41,42	Storage of social perceptual representations. Contributing region to imagination of specific future events and autobiographical memory retrieval.
	Superior temporal cortex	22	Active in adult moral judgment .
	Posterior superior temporal sulcus (STS)	22	Active in recognition of socially relevant perceptual features of faces, body posture and movements. Active in moral judgment .
	Posterior temporal lobes	20,36,37	Assists in storage of representations of objects, actions and spatial maps; storage of social semantic knowledge.

	Anterior temporal lobes (aTL)	20,21,38	Storage of knowledge of social concepts and values that are more context independent (eg honor and greed).
Occipital lobe		18,19,37,39,40	Active in creating representations of objects, actions and spatial maps; storage of social semantic knowledge.
Parietal lobe	Inferior parietal lobe	40	Contributing region to imagination of specific future events and autobiographical memory retrieval. Active especially in males in responses requiring moral sensitivity to others.
	Temporo-parietal junction (proximate to insula and rich in spindle cells)	39,40	Active in adult moral judgment, less so in adolescence.
Limbic and paralimbic areas	Amygdala		Activation in basic emotional and motivational states thereby affecting moral behavior. Active in exercise of self control, patience, and empathy. Active in moral judgment.
	Hypothalamus especially ventromedial sector		Activation in basic emotional and motivational states thereby affecting moral behavior. Active in exercise of self control, patience, and empathy.
	Insula		Activation in basic emotional and motivational states thereby affecting moral behavior. Active in exercise of self control, patience, and empathy. Active in judgments of fairness.
	Anterior insula		Active in empathy with the pain of others. Pleasure and pain processing.
	Posterior insula		Processing of hypothetical reward outcomes.
	Hippocampus		Role in storage of memories according to context.
	Thalamus		Contribution to pain and pleasure in initial processing of sense input.
Basal ganglia (BG)	Ventral striatum		Active in judgments of fairness. Activation in basic emotional and motivational states thereby affecting moral behavior.

	NAc (in association with Ventral striatum)		Hedonic and aversive processing.
	Caudate nucleus		Active in responding to moral values, attitudes and moral emotions.
	Pallidum		Active in judgments of fairness.
	Vental pallidum		Aspects of pain and pleasure processing.
Septal nuclei			Participation in assessing the reward potential of events.
Cerebellum			Contribution to processing of unexpected reward and pain.
Brainstem	Rostral brainstem tegmentum		Active in thalamic activity and therefore in filtering cortical inputs.

¹ Christof Koch, *Consciousness: Confessions of a Romantic Reductionist* (Cambridge MA: MIT Press, 2012).

² Arthur Schopenhauer, "On the Freedom of the Will," translated by Morris Zucker in *The Philosophy of American History: The Historical Field Theory* (New York NY: Arnold-Howard, 1945), p. 531.

³ Roger Scruton, *The Soul of the World* (Princeton NJ: Princeton Univ. Press, 2014).

⁴ José M. Soares et al., "A Hitchhiker's Guide to Diffusion Tensor Imaging," *Frontiers in Neuroscience* 7 (2013): 31.

⁵ Pontifical Council for the Sciences, Working Group on Neuroplasticity and Education, *Final Statement* (October 2010). Available at: <http://www.pas.va/content/dam/accademia/pdf/sv117/sv117.pdf> Accessed 5 June 2017.

⁶ Sources for Table 1: Mario Beauregard et al., "Neural Correlates of Conscious Self-Regulation

of Emotion," *The Journal of Neuroscience* 21 (2001): 1-6; Stephanie Burnett et al., "Development during Adolescence of the Neural Processing of Social Emotion," *Journal of Cognitive Neuroscience* 21 (2009): 1736-50; William D. Casebeer, "Moral Cognition and Its Neural Constituents," *Nature Reviews Neuroscience* 4 (2003): 840-47; Arnaud d'Argembeau and Eric Salmon, "The Neural Basis of Semantic and Episodic Forms of Self Knowledge: Insights from Functional Neuroimaging" in *Sensing Systems in Nature*, ed. Carlos López-Larrea (Austin TX: Landes Bioscience, 2011); J. M. Fuster, *The Prefrontal Cortex* (New York NY: Raven Press, 1989); J. Grafman, "Alternative Frameworks for the Conceptualization of Prefrontal Functions" in *Handbook of Neuropsychology*, ed. F. Boller and J. Grafman (Amsterdam: Elsevier, 1994); J. D. Greene et al., "An fMRI Investigation of Emotional Engagement in Moral Judgment," *Science* 293 (2001): 2105-08; J. D. Greene, "The Neural Bases of Cognitive Conflict and Control in Moral Judgment," *Neuron* 44 (2004): 389-400; J. D. Green and Jonathan Haidt, "How (and Where) Does Moral Judgment work?" in *Trends in Cognitive Sciences* 6 (2002): 517-23; Carla L. Harenski et al., "Gender Differences in Neural Mechanisms Underlying Moral Sensitivity," *Social Cognitive and Affective Neuroscience* 3 (2008): 313-21; Carla L. Harenski et al., "Neural Development of Mentalizing in Moral Judgment from Adolescence to Adulthood," *Developmental Cognitive Neuroscience* 2 (2012): 162-73; Philip L. Jackson et al., "To What Extent Do We Share the Pain of Others? Insight from the Neural Bases of Pain Empathy," *Pain* 125 (2006): 5-9; J. E. LeDoux, *The Emotional Brain* (London UK: Phoenix, 1998); S. Leknes and I. Tracey, "A Common Neurobiology for Pain and Pleasure," *Nature Reviews Neuroscience* 9 (2008): 314-20; Tatia M. C Lee et al., "Regulation of Human Behaviors (Review)," *Future Neurology* 2 (2007): 189-99; Jorge Moll et al., "The Neural Basis of Human Moral Cognition," *Nature Reviews Neuroscience* 6 (2005): 799-808; R. Passingham, *The Frontal Lobes and Voluntary Action* (Oxford UK: Oxford Univ. Press, 1993); Perrine Ruby et al., "Perspective Taking to Assess Self-Personality: What's Modified in Alzheimer's Disease?" in *Neurobiology of Aging* 30 (2009): 1637-51; J. N. Wood et al., "Psychological Structure and Neural Correlates of Event Knowledge," *Cerebral Cortex* 15

(2004): 1155-61.

⁷ C.D. Broad, *The Mind and Its Place in Nature* (London UK: Routledge and Kegan Paul, 1925), p. 647.

⁸ S. Kripke, *Naming and Necessity* (Cambridge MA: Harvard Univ. Press, 1972).

⁹ D. Davidson, "Actions, Reasons and Causes," *Journal of Philosophy* 60 (1963): 685-700.

¹⁰ Michael S. Gazzaniga, *Who's in Charge? Free Will and the Science of the Brain* (New York NY: Harper Collins, 2011).

¹¹ Susan Greenfield, *I.D.: The Quest for Identity in the 21st Century* (London UK: Sceptre, 2008).

¹² David J. Chalmers, *The Conscious Mind: In Search of a Fundamental Theory* (New York NY: Oxford Univ. Press, 1996).

¹³ Thomas Metzinger, ed., *Neural Correlates of Consciousness: Conceptual and Empirical Questions* (Cambridge: MIT Press, 2000).

¹⁴ Derek S. Jeffreys, "The Soul is Alive and Well: Non-Reductive Physicalism and Emergent Mental Properties," *Theology and Science* 10(2004): 205-25.

¹⁵ Scruton, p. 34.

¹⁶ Thomas N. Munson, "Wittgenstein's Phenomenology," *Philosophy and Phenomenological Research* 23 (1962): 37-50.

¹⁷ Scruton, p. 36.

¹⁸ Ibid.

¹⁹ Ibid., p. 34.

²⁰ Ibid., p. 36.

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The Libet experiments have been used by various commentators to argue that, because brain responses to certain stimuli appear to precede a conscious response to that stimuli, human free will must therefore be an illusion. Cf. Benjamin Libet et al., "Responses of human somatosensory cortex to stimuli below threshold for conscious sensation," *Science* 158 (22 December 1967): 1597 - 1600.

²¹ For an overview, see S. Marc Breedlove, Neil V. Watson and Mark R. Rosenweig, *Biological Psychology: An Introduction to Behavioral, Cognitive and Clinical Neuroscience*, 6th ed. (Sunderland: Sinauer Associates Inc., 2010).

²² Walter Mischel et al., "Cognitive and Attentional Mechanisms in Delay of Gratification," *Journal of Personality and Social Psychology* 21 (1972): 204-18.

²³ *The Complete Works of Aristotle*, ed. Jonathan Barnes (Princeton NJ: Princeton Univ. Press, 1984), 408b.

²⁴ JoAnn Difede and Judith Cukor, "Evidence-Based Long-Term Treatment of Mental Health Consequences of Disasters among Adults" in *Mental Health and Disasters*, ed. Y. Neria et al. (Cambridge UK: Cambridge Univ. Press, 2009), pp. 336-39.

²⁵ Scruton, p. 76.

²⁶ Teresa M. McDevitt and Jeanne Ellis Ormrod, *Child Development and Education* (Upper Saddle River NJ: Merrill, 2010), pp. 425-27 and 480-515.

²⁷ Arthur Aron et al., "The Experimental Generation of Interpersonal Closeness: A Procedure and Some Preliminary Findings," *Personality and Social Psychology Bulletin* 23 (1997): 363-77.

²⁸ Links to the extensive and fascinating research of David Perrett are found at <https://risweb.st-andrews.ac.uk/portal/en/persons/david-ian-perrett%286a987feb-d99f-4e51-84ed-5f6d87c19dbc%29/researchoutput.html>.

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Viktor Frankl, *Man's Search for Meaning*, (Boston, Massachusetts: Beacon, 1992), p109.

²⁹ Aristotle, 1107a1-3.

³⁰ Banez noted that Aquinas applied the Platonic notion of participation to the Aristotelian understanding of the soul as actualization of perfections. Crucially, he identified being and actuality. Dominic Banez, *The Primacy of Existence in Thomas Aquinas*, translated by Bnejamin S.

Llamazon (Chicago IL: Henry Regnery, 1966).

³¹ Aquinas, *Summa Theologiae* I, q.3, a.4.

³² Cornelio Fabro and B. M. Bonansea, "The Intensive Hermeneutics of Thomistic Philosophy: The Notion of Participation," *Review of Metaphysics* 27 (1974): 463.

³³ E. Feser, *Philosophy of Mind: A Beginner's Guide* (Oxford UK: Oneworld, 2007); J. Madden, *Mind, Matter, and Nature: A Thomistic Proposal for the Philosophy of Mind* (Washington DC: The Catholic Univ. of America Press, 2013).

³⁴ Fabro, p. 457.

³⁵ Bernardo Carlos Bazán, "The Human Soul: Form and Substance? Thomas Aquinas's Critique of Eclectic Aristotelianism," *Archives d'histoire doctrinale et littéraire du Moyen-âge* 64 (1997): 114 (my italics).

³⁶ Fabro, p. 459.

Boethius, *Liber De Persona et Duabus Naturis Contra Eutychem Et Nestorium*, Chapter 4. Available at:

http://www.documentacatholicaomnia.eu/02m/0480-0524,_Boethius._Severinus,_Liber_De_Persona_Et_Duabus_Naturis_Contra_Eutychem_Et_Nestorium,_MLT.pdf

³⁷ G.E.M. Anscombe, "On the Notion of Immaterial Substance" in *Substance and Things: Aristotle's*

Doctrine of Physical Substance in Recent Essays, ed. Mary Louise O'Hara (Washington DC: Univ. Press of America, 1982), pp. 252-62.

³⁸ Aquinas, I, q.75, a.6. Aquinas argues for the personal individuality of the soul as spiritual principle.

³⁹ Larry Squire et al., *Fundamental Neuroscience*, 3rd ed. (Burlington MA: Elsevier, 2008), p. xix.

⁴² Antonio Damasio, "The Somatic Marker Hypothesis and the Possible Functions of the Prefrontal Cortex," *Philosophical Transactions of the Royal Society of London, Series B: Biological Sciences* 351 (1996): 1413-20.

⁴¹ Nancy Sherman, *Making a Necessity of Virtue: Aristotle and Kant on Virtue* (Cambridge UK: Cambridge Univ. Press, 1997), p. 55.

⁴⁰ Martha C. Nussbaum, *Upheavals of Thought* (Cambridge UK: Cambridge Univ. Press, 2001), p.5.

⁴³ Nussbaum, p. 4.

⁴⁴ *Ibid.*, pp. 22 and 31.

⁴⁵ *Ibid.*, p. 63.

⁴⁶ *Ibid.*, p. 61.

Aristotle, 1119a and b.

Aristotle, 1448b1-19.

G. Rizzolatti, et al., 'Neurophysiological mechanisms underlying the understanding and imitation of action,' *Nature Reviews Neuroscience*, 2 (2001): 661-670.

⁴⁷ S. Hurley, "The Shared Circuits Model (SCM): How Control, Mirroring, and Simulation Can Enable Imitation, Deliberation, and Mindreading," *Behavioral and Brain Sciences* 31:9 (2008).

⁴⁸ Scruton, p. 190.

⁴⁹ Martha C. Nussbaum and Hilary Putnam, "Changing Aristotle's Mind" in *Essays on Aristotle's De Anima*, ed. Martha Nussbaum and Amelie Oksenberg Rorty (Oxford UK: Clarendon, 1992), p. 56.

⁵⁰ Jean-Luc Marion, *On Descartes' Metaphysical Prism: The Constitution and the Limits of Onto-theology in Cartesian Thought* (Chicago IL: Univ. of Chicago Press, 1999), p. 91; Leo Elders, *The Metaphysics of Being of St. Thomas Aquinas: In a Historical Perspective* (Leiden: Brill, 1993), p. 185.

⁵¹ B. Hill and H. Lagerlund, *The Philosophy of Francisco Suarez* (Oxford UK: Oxford Univ. Press, 2009).

⁵² I. Kant, *The Critique of Pure Reason*, trans. J. M. D. Meiklejohn (1781). Accessed at <http://www.gutenberg.org/files/4280/4280-h/4280-h.htm>.

⁵³ Aquinas, of course, was writing in an age when the Pauline vision of participated existence "in him we live and move and have our being" (Acts 17:28) was unquestioned. Some contemporary

anti-Thomistic prejudices appear fueled by his consequent emphasis on soul as a substantial entity, accentuating the theological over the ontological, and opening the door to accusations of substance dualism.

⁵⁴ Scruton, pp. 68-69.

⁵⁵ Aquinas, *In II liber Physicorum*, 2, 153.

⁵⁶ Scruton, p. 185.

⁵⁷ *Ibid.*, p. 187.

⁵⁸ *Ibid.*, p. 185.

⁵⁹ *Ibid.*, p. 190.

⁶⁰ Personal correspondence with the author, 3 November 2012.

⁶¹ John Haldane, "A Return to Form in the Philosophy of Mind," *Ratio* 11 (1998): 253-77.

⁶² Although he does not subscribe to hylomorphic metaphysics, Putnam's realist orientation is evident. Hilary Putnam, "Sense, Nonsense and the Senses: An Inquiry into the Powers of the Human Mind," *Journal of Philosophy* 91 (1994): 445-517.

⁶³ Haldane, pp. 253-77.

⁶⁴ John Bickle, "Philosophy of Mind and the Neurosciences" in *The Blackwell Guide to Philosophy of Mind*, ed. Stephen P. Stich and Ted A. Warfield (Cambridge MA: Blackwell, 2003), p. 333.