

Modal Epistemology and the Formal Identity of Intellect and Object

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1. Introduction

Both Aristotle and Thomas Aquinas subscribe to a Formal Identity theory about the relation between the human mind and the extra-mental objects of our understanding. This has been one of the most controversial features of Aristotelian and Thomistic metaphysics of the mind. I offer here a defense of the Formal Identity Thesis and of the immateriality of the human intellect, based on specifically epistemological arguments about our knowledge of necessary or essential truths, including especially essential truths about value.

Rather than speaking in terms of *a priori* vs. *a posteriori*, I will speak of knowledge of necessity (*de necessario*) and knowledge of contingency (*de contingente*). The epistemological problem I will focus on concerns what I call the Veil of Contingency. There is a gap between the set of contingent truths (available in sense perception, memory, and testimony) and the set of necessary truths. The contingent truths about the actual world under-determined the necessary truths, including necessary truths of mathematics, science, and ethics.

For Aristotelians, the class of necessary truths and the class of truths that are somehow grounded by essences are identical. All necessary truths are essential truths or grounded in essential truths, and all essential truths and all truths grounded in essence are necessary. For similar reasons, the necessary and the “universal” are coterminous. What is universal is necessary, and what is necessary is universal. Merely accidental generalizations do not count as ‘universal’ in the relevant sense.

For Aristotelians, it is abstraction by the active intellect that gives us access to essence, and thereby to *de necessario* knowledge. When the intellect gains access to a form, that form is “in” the intellect. That is, each concept of an essence is a form, a form belonging to an individual mind and of the same kind as (conspecific with) forms occurring outside the mind in nature. There is a direct causal relation of some kind (I will argue, a *formal* causal connection) between these internal forms and acts of understanding and of judgment by the individual human being. Aquinas and those scholastics who follow him call these internal forms the ‘intelligible species’.

According to what I am calling the Formal Identity Thesis, the intelligible species is literally conspecific with the substances or accidents in nature being understood. This thesis is explicitly and notoriously propounded by Aristotle in Book 3 of *De Anima*:

Now as to that part of the soul by which it has both cognition and understanding... it must be something unaffected which yet receives the form

and is potentially of the same kind as its object but not the same particular...

(Aristotle, p. 201, Book 3, chapter 4)

And indeed there is an intellect characterized by the capacity to become all things, and an intellect characterized by that to bring all things about, and to bring them about in just the way that a state, like light, does. (For in a way, light also makes things that are potentially colours colours in actuality.)

(Aristotle, p. 204, Book 3, chapter 5)

I will argue in section 2 that some reification of form is necessary to ground our knowledge of objective value. I will couch the argument as posing a problem for physicalism, taking physicalism to be the most plausible version of an anti-Aristotelian, reductionistic kind of naturalism. Then, in section 3, I offer an argument in favor of an Aristotelian and Thomistic rather than Platonistic solution to the problem. I consider an objection to the account in section 4, namely: how is the Formal Identity Thesis compatible with the existence of human error about necessary truths?

2. Knowledge De Bono: A Problem for Physicalism

Suppose that we have some knowledge of objective value. What sort of metaphysical conclusions might we draw from this? Two things might seem to follow: that there are objective facts about value, and that there is some real connection between the

human mind and those evaluative facts, a connection that is inconsistent with physicalism or materialism. I will illustrate this sort of argument by developing some words that Plato attributes to Socrates in *The Phaedo* into an argument against the compatibility of microphysicalism and intentional or rational agency (98e-99b):

For, by Dog, I fancy these bones and sinews of mine would have been in Megara or Boeotia long ago, carried thither by an opinion of what was best, if I did not think it was better and nobler to endure any penalty the city may inflict rather than to escape and run away. But it is most absurd to call things of that sort causes. If anyone were to say that I could not have done what I thought proper if I had not bones and sinews and other things that I have, he would be right. But to say that those things are the cause of my doing what I do, and that I act with intelligence but not from the choice of what is best, would be an extremely careless way of talking. Whoever talks in that way is unable to make a distinction and to see that in reality a cause is one thing, and the thing without which the cause could never be a cause is quite another thing.

We can reconstruct Plato's argument using the notion of metaphysical grounding (Fine 1999, 2012, Rosen 2010, Schaffer 2016). The resulting argument is similar, *mutatis mutandis*, to Jaegwon Kim's over-determination argument against the possibility of mental causation in a purely physical world (Kim, pp. 32-69). I use it to show the impossibility of grounding by objective value in a microphysical world.

Microphysicalism (definition). Microphysicalism is true if and only if (1) the microphysical facts are ungrounded (or fundamental), (2) all the facts about human thought and actions and all the facts about the causes of human thought and action are wholly grounded in the microphysical facts.

P1. If rational agency is real, then I have rational intentions.

P2. The content of any of my rational intentions results from what reasonably seems best to me to do.

P3. What reasonably seems best to me to do is either (a) partly caused by the real value of things or (b) partly grounded in the real values of things. To be valuable, practical reason must be substantively connected to reality.

SC1. So, if I have real agency, then there are states of mine (namely, states of something's seeming best for me to do) that are either partly caused by or partly grounded in the real values of things. (From P1-P3)

SC2. If microphysicalism is true, then these states are wholly grounded in the microphysical facts, and all of their causes are wholly grounded in the microphysical facts. (From the definition of microphysicalism)

P4. None of the real values of things are even partly (weakly) grounded by the microphysical facts.¹ (Weak grounding is the reflexive counterpart to grounding—see Fine 2012. I.e., x is weakly grounded in y if and only if either x is grounded in y or $x = y$.)

SC3. So, if microphysicalism is true and I have real agency, then there are states involving human agency that are partly grounded in the real value of things and wholly grounded in the microphysical facts. (From SC1-2, P4)

P5. No Over-Grounding: If x is partly grounded in the y 's and wholly grounded in the z 's, then either some of the y 's are partly (weakly) grounded in the z 's or the some of the z 's in the y 's.

SC4. If microphysicalism is true, none of the microphysical facts are partly (weakly) grounded in the facts about the real values of things, since those microphysical facts are metaphysically fundamental (ungrounded). (From the definition of microphysicalism)

¹ I am not denying that the value of *particular* objects, events, and situations are partially grounded in the particular microphysical facts (as reflected in Moore's principle of the supervenience of evaluative facts on natural facts). By "the value of things" I mean the value of *general* properties and property-configurations: the value of health in general, for example, and not the value of the state of someone's body at a time. I am claiming that the facts about which *kinds* of thing favor which *kinds* of action are not grounded in the microphysical facts.

So, if I have real agency, what seems best for me to do is not wholly grounded in the microphysical facts. (From SC3-4, P5)

Therefore, if I have real agency, microphysicalism is false (by the definition of microphysicalism).

The first three premises are predicated on the idea (ably defended in recent years by Jonathan Dancy) that our intentions can be sensitive to reasons, considered as objective facts about what actions are favored in various circumstances.

Microphysicalists have essentially three options in response to this argument: they can deny the reality of human agency, they can deny the existence of real or objective values altogether, or they can claim that objective values are somehow wholly grounded in the microphysical facts. None seems promising. Jonathan Dancy, Christina Korsgaard and many others in recent years have created powerful objections to a Humean subjectivism about value. And, in any case, it seems that subjective values must ultimately be grounded in objective value, if reason is to have any normative force at all. Even if one supposes that particular things are good for an agent only because he or she desires them, one must still suppose that desires are the sort of thing that (other things being equal) ought to be satisfied—that there is something objectively worthy about seeking to satisfy them.

Knowledge of value requires knowledge of necessities. There are two compelling Aristotelian reasons why knowledge of the good must be grounded in the knowledge of specific natures.

1. Since *good* is not a genus (*Summa Contra Gentiles* I, 25, 6 and *De Veritate* 1), we grasp particular goods by understanding them as standing in analogies to one another, modes of perfection of different species. So, it is impossible to gain knowledge of the good except in relation to definite forms. If there were no knowledge of essences, there would be no knowledge of value.
2. We gain knowledge of the good (and other transcendentals, like *being*, *truth*, and *one*) by *reflection* on the primary acts of the intellect, which must be directed to specific natures.

Being and goodness are convertible. The good is *being as desired*. A good *F* is an *F* that is perfect in its specific nature. The particular goods are analogously and not univocally related to one another. This means that there is no such thing as *a* or *the* form of the good, whether we think of such a form as a Platonic substance or as an individual form. Our knowledge of the objective good is dependent on our knowledge of specific natural forms and of their necessary relations of analogy to one another.

There must be, in addition, a connection between our understanding of essences and forms, on the one hand, and our knowledge of necessary truths, on the other. Our knowledge of necessities is, with one exception, based upon our understanding of the

essences involved. (The one exception is that we can infer the necessary existence of God as first cause, without grasping His essence.) Yves Simon describes this connection between essences and necessities:

Consider theoretical science. To the extent that it achieves its ideal, it moves beyond the existential data to concern itself with general types and intelligible laws, or, in other words, with formulae of possibility, with essential necessities. Unsupported by rational analysis, empirical hypotheses derived from factual observations represent an incomplete kind of knowing, indeed, a partial defeat of science. The perfection of theoretical knowledge depends above all on the necessity of its object. Thus every time we manage to abstract from experience to reach a necessary object, our understanding, though bearing now on an object separated from existence, is more perfect than our experimental knowledge, which bears on physical existence alone. (Simon, p. 86)

Can sensory knowledge alone provide us with this knowledge of necessity? I would argue that it cannot, since sensory knowledge can give us knowledge only of contingent matters of fact, and there is a Veil of Contingency lying between such matters of fact and the necessary features of the essences of the things perceived. David Hume was perhaps the first to posit such a veil explicitly, arguing that we never directly observe the “necessary connections” between matters of fact, but this deficiency of the power sensory perception was already an implicit element in the

Aristotelian and scholastic traditions. We can only perceive directly the proper sensibles of each of our five senses (i.e., colors, sounds, smells, tastes, and tactile qualities). Even when the common sense is included, our sensory knowledge is limited to the actual distribution of these qualities and quantities, which always lies on the near side of the Veil of Contingency.

It is true that the sensory imagination gives us some limited access to information about what is possible or impossible. However, it is clearly at best a fallible guide to possibility, and so not a source of real knowledge. In addition, since we are concerned here about our knowledge of value, the power of imagination by itself cannot provide us with access to the real or objective *value* of possible situations. Imagination can reveal facts only about necessities involving only the proper sensibles and space and time (Kant's forms of intuition). It cannot, by itself, tell us any of the necessary truths of ethics or moral philosophy. This is not to deny that imagination is indispensable in discerning the right thing to do in particular circumstances.

In addition, there is what Aquinas terms the 'estimative' sense of animals (and the corresponding 'cogitative' power of humans), which does give them some limited access to the evaluative dimension of reality, i.e., what is to be sought or avoided, such as: what is edible, dangerous, desirable as a mate, and so on. But again, this does not rise to the level of general and scientific knowledge of objective value. For that, the intellect must be involved. And so, there must be some direct connection between the intellect and the forms to be understood, a connection that does not depend

constitutively on sense perception or imagination or the estimative sense and so is able to penetrate the Veil of Contingency. I am not denying that such intellectual knowledge depends causally on prior sense experience, as a necessary but not sufficient condition.

3. Arguments for a Connection

3.1 A transcendental argument

1. If there were no connection, causal or constitutive, between our judgments about necessity and the corresponding facts about essences, we would have no knowledge of necessity.

2. We do have such knowledge.

Therefore, there is some connection, causal or constitutive, between our judgments of necessity and the corresponding essential facts.

Edmund Gettier's paper (1963) revealed the bankruptcy of defining knowledge in terms of justified true belief. Post-Gettier reflections on knowledge have revealed that, at least in the paradigmatic cases of perception, memory, and testimony, knowledge requires a real connection of some kind between the mental state of knowledge and the facts so known. I argued in *Realism Regained* (Koons 2000a) that a similar constraint is also required for our knowledge of the laws of nature, mathematics, and logic. The key fact is that our intuitive (justified) true beliefs can also be Gettierized.

Suppose that a drug XYZ produces randomized intellectual seemings (or, if you prefer, causes our ordinary rational faculties to generate beliefs with randomized contents). When administered to a group of subjects, it is predictable that 1% end up with true intuitive beliefs, 99% with false ones. Those relying on veridical seemings (or belief-generation) under these circumstances do not gain knowledge, although they may have justified true beliefs (assuming that they don't know about the drug and its effect).

Does this result depend in any way on contingency—that is, on the possibility of a given subject believing differently? Replace the drug with genetic manipulation of human gametes. Given origins essentialism, the 1% that end up with true beliefs might have the disposition toward those beliefs essentially. This is still not good enough for knowledge.

Would it be sufficient if the seemings or dispositions to believe were essential to one's species? I think not: just replace the preceding scenarios with one in which aliens manipulate the evolutionary history of intelligent species on a 1000 planets, producing reliably true beliefs in 10, unreliably true one in 990, with all 1000 species equally adept at reproduction. The ten intelligent species with species-wide essential dispositions to true belief still lack knowledge, because of the lack of a real connection between their seemings and dispositions and the relevant truths (whether those truths are themselves necessary or contingent).

The upshot of these thought experiments is this: knowledge is undermined so long as there are relevantly similar seemings or dispositions that are unreliable with respect to truth, and which had an equal or nearly equal propensity to exist.

What if it were metaphysically impossible for there to exist relevantly similar seemings that are false? I reply: Is this impossibility supposed to be true as a matter of brute necessity? It is hard to believe in such a metaphysical necessity without some ground—a ground that only a real connection can provide. And, in any case, a merely brute necessity is too accidental to provide the needed connection between beliefs and their objects. Counterpossible scenarios in which the brute necessity was violated would be epistemologically relevant.

2.3 Defeaters of Modal Judgments

1. Necessarily, if there is no causal or constitutive connection between human intuitive judgments of necessity and the corresponding facts about essences, then there is no ironclad explanation of the genesis of reliable intuition about necessary truths in human beings.
2. Necessarily, if there is no ironclad explanation of the genesis of reliable intuition in human beings, then there is at least some reason to believe that the prior objective probability of human intuition's being reliable is low.

3. Necessarily, there being some reason to believe that the prior objective probability of R is low constitutes a second-order undercutting defeater for all intuitive knowledge, a defeater which cannot itself be defeated
4. Consequently, the absence of a causal or constitutive connection entails the existence of an undefeated undercutting defeater for all human judgments of necessity.
5. Knowledge of such an undefeated defeater would render all human judgments of necessity irrational.

3. Human Knowledge *De Necessario*: A Problem for Platonism

There are two different ways for forms to be connected to the human intellect, the Platonic and the Aristotelian way. On the Platonic way, universal forms are substances (primary beings) in their own right, and the connection between a form and a human intellect is one of *efficient* causation: the universal form acts upon the human intellect, conveying to it some information about the form's necessary connections to other forms. On the Aristotelian way, the connection is rather one of *formal* causation. For Thomists and most other scholastics, there are many individual forms of every species (both substantial and accidental). Some of these inform particulars naturally, resulting in particular instances of the species. Others inform

intellects in an intentional way, and these forms are concepts or “intelligible species.”

Forms of the same species are related to one another by a kind of functional equivalence or exchangeability. Each form has intrinsically the same capacity to inform particulars and intellects as do all other forms of the same species.

In addition, the forms of the same species could be said (as Scotus recommends) to stand in a relation of ‘less than numerical identity’ with each other. This relation could be understood to be a kind of counterfactual or counter-possible identity. Two forms of the same species would be identical if not for the individuating activity of the distinct parcels of signate matter or distinct intellects that they inform.

The main problem with the Platonic approach is that it makes human understanding a matter that is partly extrinsic to the human intellect. Here is a sketch of an argument for the Aristotelian approach:

1. Knowledge of necessary truths requires some real connection between essences of natural, extra-mental things and the judgments of the human mind.
2. This connection must fall into one of the four modes of causation: material, efficient, formal, or final.
3. The essence of a natural thing, outside the mind, obviously cannot be the material cause of the act of understanding or judgment, since the latter are accidents of the human mind and not the external thing.

4. If the essence of the natural things were efficient causes of the act of human understanding, then they would have to be Platonic forms (substances in their own right), and human understanding would depend constitutively on the interaction between the human mind and these Platonic forms.
5. In this case, understanding and judgments of necessity would not be intrinsic acts of the human mind alone, but rather the product of a system of interacting substances. The human mind would be merely passive in the act of understanding.
6. Clearly, an act of human understanding is an intrinsic or immanent act of the human mind.
7. So, the essences of external things would have to be either the formal cause or the final cause of acts of human understanding, or both.
8. If the essences of natural things outside the mind were the final cause of acts of understanding but not the formal cause, then the form of the human intellect would have to contain virtually all of the forms of things that we are capable of understanding.
9. But then sensory perception would play no role in connecting us with the essences of natural things outside the mind, which is obviously false.
10. Therefore, essences of natural things outside the mind are the formal cause of acts of human understanding and judgments *de necessario*.

If these essences are not substances, then they must function as *accidents* of the human mind. This means that it cannot be numerically the same form of equinity that

informs both my act of understanding and yours. Instead, there must be two forms of the same kind or species (namely, equinity). Similarly, the form of equinity in my mind cannot be numerically identical to the form of equinity of any individual horse.

This Aristotelian account immediately faces a problem, noted by Brower and Brower-Toland and by Panaccio. When a form acts as a formal cause of an intellectual act of understanding, it thereby constitutes a *qualitative accident* of the intellect.² However, suppose that the form that is understood is a substantial form or an accidental form belonging to one of the other, nonqualitative categories, such as quantity. In these cases, the same kind of form would have to act as a substantial or nonqualitative accidental form in relation to the natural instances of the species, but as a qualitative form in relation to the intellect.

And finally, the intelligible species has the being of an accident in the cognizer.... How could an essence [in the category of substance] ever have the being of an accident? (Panaccio, 193)

For according to this theory, concepts represent things in virtue of standing in the relation of formal sameness to them and hence, can be only “about” things that are intrinsically the same as they are. But concepts, as we have seen, are

² That they are accidents is explicitly stated by Aquinas in the *Summa Theologiae* Part I, Q5, article 4 and *Summa Contra Gentiles* I, 46. Yves Simon writes, “All major Thomists are unanimous in affirming that immanent action is a quality.” (Simon, p. 66, n29) The immanent act of understanding is such an immanent action and does not fall into the Aristotelian category of *action*, since it lacks the essential properties of that category: to exist with motion, and to produce a passion in some patient.

accidental forms falling in the Aristotelian category of Quality, and presumably qualities can only be intrinsically the same as other qualities.

(Brower and Brower-Toland, 216)

One possible answer would be that the difference lies in the way in which the forms relate to minds (as objects of understanding) and the way in which they relate to natural instances (outside of the mind). In effect, this would involve two distinct forms of formal causation, one natural and the other intentional. There are two problems with this proposal. First, it very substantially increases the complexity of the theory. We now have really five modes of causation, material, efficient, final, and two distinct modes of formal causation. Second, as Brower and Brower-Toland point out, it isn't clear that the proposal solves the problem. If an intelligible species is always a qualitative form, how could it be of the same species as a nonqualitative form in nature? It would seem to be intrinsically different from such nonqualitative forms, and so not conspecific with them.

After all, if a quality (in this case a concept) is not in itself formally (or intrinsically) the same as any nonqualitative form, how could it suddenly become such merely by being possessed or instantiated in a special way? And what would explain its becoming formally the same as this thing rather than that? (Brower and Brower-Toland, 217)

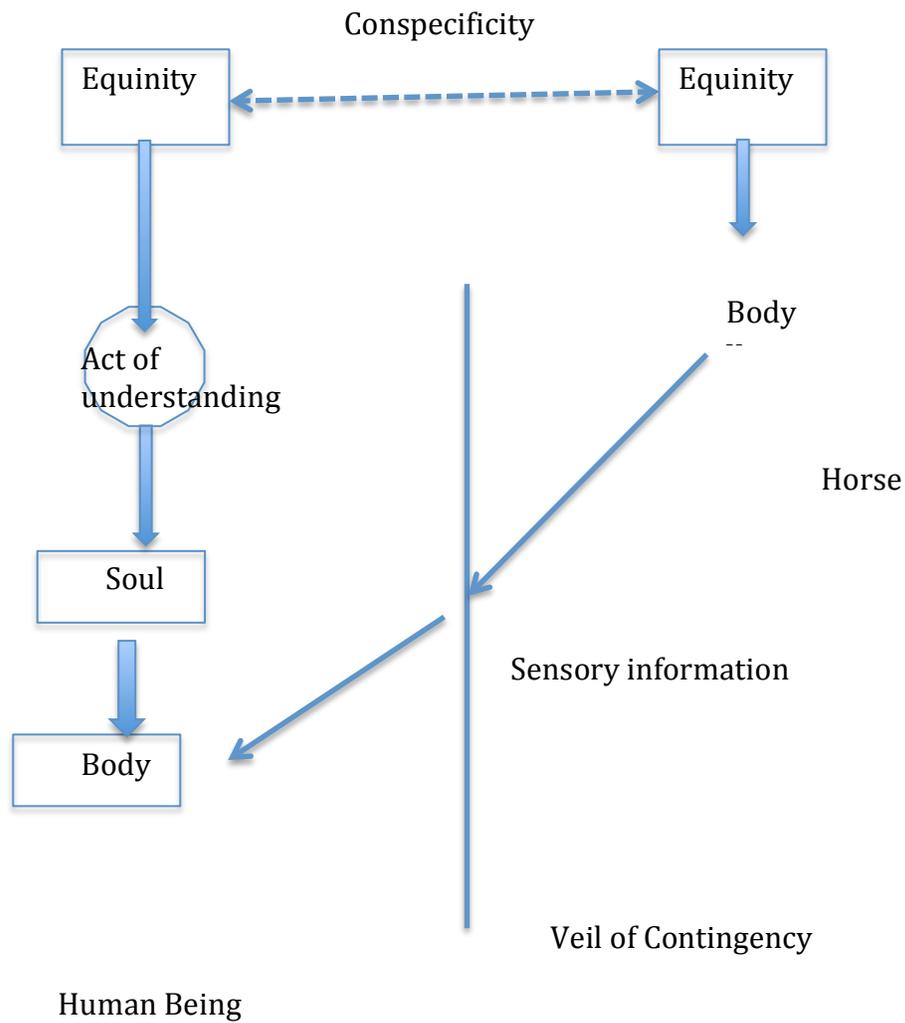
A better solution to the proposal is this: we insist that the intelligible species can be intrinsically a form of a non-qualitative sort, even though in some sense its informing of the intellect results in an intellectual “quality” of the mind. And, we should insist that it is the very *same* relation of formal causation that relates nonqualitative forms to minds (resulting in intellectual qualities) and to natural instances (resulting in substances, quantities, and other nonqualitative entities). The nonqualitative form that is an intelligible species is a kind of qualitative accident because of the peculiar nature of the thing that it informs, namely, the intellect. The form is received in a way appropriate to the receiver: as a substance or quantity (when received by matter or a material substance), and as an intellectual quality (when received by the intellect).

I think that perhaps the best way of thinking about this is to introduce a third entity into the picture: a qualitative *act of understanding*. This act of understanding is a form in the category of quality and informs the intellect in the same way that other qualities inform their subjects. The nonqualitative intelligible species would not (in my proposal) *directly* inform the intellect. Rather, it informs the act of understanding, which, in turn, qualitatively informs the intellect.

This still leaves us with a problem: how can the act of understanding (which *ex hypothesi* is an accidental form) be conspecific with substances and nonqualitative accidents, as the Identity Thesis requires? I think the answer is pretty straightforward. An intelligible species is conspecific with some natural form if and only if the two forms are functionally interchangeable, each having, by virtue of its intrinsic

character, the potentiality of doing exactly what the other does. My concept of a horse is a form that could, if it were (*per impossibile*) informing some appropriate signate matter, be the substantial form of a real horse, just as the substantial form of any real horse could, if it were (*per impossibile*) informing some act of understanding in my mind, be an intelligible species of equinity in my mind. To put the equivalence in Scotistic terms, the intelligible species of equinity in my mind is distinct from the substantial form of any given horse because of the numerical distinctness of my act of understanding the horse and the signate matter of the natural horse, just as the distinctness of the substantial forms of any two horses is grounded in the distinctness of the two parcels of signate matter.

Figure 1.



There is an analogy in Aristotelian thought between the way that color modifies the transparent medium and the way a form informs the intellect's act of understanding

(see Burnyeat 2001). I will offer analogous interpretations of the two cases. In my interpretation of the transmission of color through the air, the form of a color modifies the quality of transparency of the air. The result is transparent air (not colored air) but with the *spiritual* or *intentional* presence of color, a spiritual accident of the air itself. The form of color belongs to the category of quality, but the spiritual accident of color is a second-order quality: a quality of a quality (in this case, a quality of the quality of transparency). When instead a form of color directly modifies the surface of a body, the result is a body with the quality of color, i.e., a colored body. Color does not modify the air in that way but only indirectly, via modifying the quality of transparency. Therefore, a spiritual change in quality does not require any change in the first-order qualities of the air, and so, as Aquinas teaches, the spiritual change in the transparent medium does not require any natural change (*In II De Anima*, Lectio 14 n418).

Since transparent air lacks any intrinsic color, the quality of transparency is a potential subject of any color whatsoever. Similarly, since the act of understanding is an immaterial act (i.e., an act only of the soul, without a corporeal organ), it is a potential subject of any material form whatsoever (that is, any form whose natural subject is material).

4. Deflationary alternatives to the Identity Thesis

That completes my defense of the Aristotelian and Thomistic doctrine of the formal identity of the intelligible species with natural forms. In this section, I will consider three alternative interpretations of Aquinas on this point, or perhaps we should call them three *deflationary interpretations* of the Formal Identity Thesis:

1. Formal identity is just similitude, similarity (Panaccio)
2. Formal identity consists merely in causal contact with the world (Pasnau and O'Callaghan).
3. Formal identity is a primitive form of intentionality (Brower and Brower-Toland)

4.1 Formal Identity is Just Similitude (Panaccio)

Claude Panaccio has argued that formal identity is just similitude. If we ask how does the nature of the thing understood exist in the mind, Panaccio contends, “The striking thing here is that when Aquinas wants to tackle the question, he inevitably resorts to the idea of mental similarity (similitude) as being explicative in such matters.”

(Panaccio, 187) Panaccio cites the Disputed Questions on Truth I, 3: “The intellect forming quiddities has *nothing but a similitude* of the thing existing outside the mind [Intellectus formans quidditates non habet nisi similitudinem rei existentis extra animam].” (Panaccio, p. 193)

Panaccio argues: “The very expression ‘forming quiddities’ that could make us think that the quiddities existed somehow in the mind is here entirely explained by—and hence reduced to—similitude, rather than the other way around.” (Panaccio, p. 193)

However, as Stump has argued, the relevant notion of similitude is to be understood in terms of the sharing of forms. Things can be similar in many ways: what makes an act of understanding epistemically relevant is that it shares the very same sort of form shared by the natural species being understood.

“‘Similitudo’ is cognate with ‘similis’ (the Latin for ‘similar’); and things are similar insofar as they share qualities—or, as Aquinas would say, forms. And so, on his view, ‘similitude is grounded in an agreement in or sharing of forms. Consequently, there are many kinds of similitude, corresponding to the many ways of sharing forms.’ (ST I.4 a.3) See also QDV 8.8: ‘There is similitude between two things insofar as there is agreement in form.’” (Stump, p. 290n5)

4.2 Formal Identity Consists in Mere Causal Contact (Pasnau, O’Callaghan)

Robert Pasnau and John O’Callaghan have suggested that the formal identity of our concepts with extra-mental forms consists simply in their causal contact with that external world.

“Aquinas’s claims of a formal identity and a likeness relationship between knower and known are not just unargued assumptions in his theory of knowledge. Rather, these claims should be seen as based on causal facts about the relationship between cognitive agents and the outside world. It’s because external objects make an impression on our sensory organs and (indirectly) on our higher-order faculties that those impressions, under the name ‘species,’ are formally identical to, and are likenesses of, external objects. Formal identity is thus guaranteed by our causal connections with the world.... In the end, formal identity is a matter of something entirely uncontroversial: that our ideas and impressions are caused from without.” (Pasnau, p. 105)

O’Callaghan similarly suggests that causation alone is sufficient for the relevant kind of similitude or formal identity:

It is a general principle for St. Thomas that agents act to produce a likeness of themselves in their effects. There is a common but simplistic way of understanding this that renders it manifestly false, namely something like visual or sensual likeness... But St. Thomas does not understand it in this visual way. The character of the effect is determined by the characteristic of the cause relevant to its agency—the pitcher was shattered because the rock was solid and massive, not because it was gray.... The formal character of the effect is determined by the formal character of the cause—that is what the likeness or similitude consists in. (O’Callaghan, p. 228)

However, a causal connection is not, by itself, sufficient to explain our knowledge of the essential truths associated with natural forms, if the causal chain between the natural entities and the mind is interrupted by the Veil of Contingency. If every causal connection is mediated by merely contingent events in the realm of sensibility, then we cannot explain our knowledge of necessary truths. We need a causal connection of some kind (including, possibly, a formal-causal connection) between those natural forms and human judgments.

O’Callaghan adds a factor that might render his account and mine compatible. He suggests that a causally generated “likeness” grounds cognition only because of the nature of the human intellect:

“So why is a likeness in a cognitive power, in particular in the intellect, a cognition? Not simply because it is a likeness as such, but because of the character of the recipient of the likeness. The effect is received in the recipient after the mode of being of the recipient, not after the mode of being of the cause or agent.” (O’Callaghan, p. 231)

This is correct, so long as we take into account the effect that is produced in these cases includes the fact that the natural form stands in a relation of formal-causation to an act of understanding, a result that does not follow in all cases of efficient causation alone.

4.3 Formal Identity is Just Primitive Intentionality

Jeffrey Brower and Susan Brower-Toland have suggested that, in Aquinas's theory, the understood forms are "present" in the intellect simply because the intellect contains a concept that represents the form. Brower and Brower-Toland propose that this representation relation is metaphysically primitive or undefinable for Aquinas. They propose, "Whenever Aquinas speaks of the form of some object being intentionally present in the mind, we take this to mean that the form of the object in question is present in the mind via the mind's possession of a concept that represents it." (Brower and Brower-Toland, p. 227) They cite the *Disputed Questions on Truth* 2.3 ad 9: "The likeness can be understood as representation—and this sort of likeness is required between cognizer and cognized."

The textual evidence for this interpretation is inconclusive, and so the hermeneutic question must turn on which proffered theory makes the most sense. I agree with Brower and Brower-Toland (and with Pasnau and others) that the problem of intentionality alone may not be sufficient to take the Formal Identity theory seriously. (However, see Klima 2001a and 2001b, and Ross 2008, for impressive arguments to the contrary.) However, once we take into account the problem of knowledge *de necessario*, the need for the formal action of natures on the mind becomes clear.

What if we tried to amplify the Brower-Brower-Toland account by making the primitive intentionality relation into a formal-causal relation, of the sort that could convey information about necessary essential truths to the mind? There would be two difficulties with such a proposal. First, in terms of economy, it would require a large number of formal-causal connections for each human concept: the concept would have to be simultaneously informed by *all* the natural forms of the same species or genus, and not just by a single form located in the mind. Second, and more importantly, the proposal would run afoul of the anti-Platonic argument in section 3. The mechanisms of human understanding would no longer be entirely intrinsic to the individual human mind. Instead, the subject of understanding, the one who really understands, would comprise the human being together with all of the natural forms intended by that human's thoughts.

5. How is Error Possible?

Does the Thomistic-Aristotelian account prove too much? If we can have direct, intellectual access to intelligible forms, how is any subsequent error possible?

There are three quite easy sources of error on the Thomistic account, and one that is more difficult to accommodate.

1. Slippage between intellectual judgments and linguistic expression

As competent users of natural language, we must have the reliable capacity to “translate” judgments into linguistic statement and vice versa, but this capacity needn’t be infallible. It would be possible to misstate our conclusions in natural language.

2. Errors about individual cases, based on omission

In making judgments about particular cases, we can err by neglecting to include some value-laden properties of the particular case. As Aquinas observes, no finite good is perfectly good. All actual cases will be mixtures of good-making and bad-making features. We can make an erroneous judgment about the all-things-considered valence of the case by leaving certain features out of intellectual consideration.

3. Computational errors

Since the value of particular cases results from the combination of several different evaluatively-relevant factors, we can make computational or calculational errors in judging the all-things-considered value of the whole. We can fail to add or subtract factors properly. Some may intensify or attenuate the value of other factors, and we can fail to compute correctly the final result of this interaction.

The case that is most difficult for Thomists to accommodate is error about is the *pro tanto* value of a single form that we understand. Apprehension of value, like the sense

perception of a proper sensible quality, is infallible. However, even here some error can be possible, if we can only partly or imperfectly understand a form.

4. Our grasp of the essence of a property can be incomplete or confused.

But if our understanding of the essence of a species involves a form of that very species directly informing an act of understanding, how could our knowledge of essences incomplete or imperfect? Thomas Aquinas addresses this question in Q85 of the First Part of the *Summa Theologiae*. In article 3, he explains that we can understand a form imperfectly:

The perfect act of the intellect is complete knowledge, when the object is distinctly and determinately known; whereas the incomplete act is imperfect knowledge, when the object is known indistinctly, and as it were confusedly. A thing thus imperfectly known, is known partly in act and partly in potentiality, and hence the Philosopher says (Phys. i, 1), that “what is manifest and certain is known to us at first confusedly; afterwards we know it by distinguishing its principles and elements.” Now it is evident that to know an object that comprises many things, without proper knowledge of each thing contained in it, is to know that thing confusedly. (*Summa Theologiae* I 85 a3)

In this case, our subsequent acts of judgment do not perfectly track the essential features of the essence that we understand. This leaves us with two sub-options: (i)

the intelligible species is present in our mind in an incomplete or mutilated form, or (ii) the complete intelligible species is related to the act of understanding by way of an incomplete or mutilated instance of formal causation. In other words, we must ask: Does the fault lie in the intelligible species itself or in its imperfectly informing of the intellect? Both views incur some cost in terms of ontological and theoretical parsimony.

The best answer to this question will depend on how we understand cases of monstrosity in nature. Should we say that in such cases (like that of the mule) the substantial form itself is incomplete or mutilated, or should we say that its formal causation of the composite substance is somehow thwarted or interfered with?

In any case, we have to be careful about overpopulating the world with either defective forms or defective cases of formal causation, since such overpopulation would have skeptical consequences for our understanding of forms. It must be the case that *normally* forms are complete and inform completely, so that acts of abstraction lead normally to knowledge.

5. Substituting proper accidents for differentiae

In article 4, the third reply, Aquinas a somewhat different model of error: one in which we substitute the proper accidents of a species for its true essence:

Reply to Objection 3: Substantial differences being unknown to us, or at least unnamed by us, it is sometimes necessary to use accidental differences in the place of substantial; as, for example, we may say that fire is a simple, hot, and dry body: for proper accidents are the effects of substantial forms, and make them known. (*Summa Theologiae* I 85 a4)

6. Confusing genus and species

In ST I 85 a3, Aquinas suggests an alternative way of conceiving of incomplete understanding: that the specific form incompletely understood could be identified with the generic form: so, for example, a confused understanding of human beings might consist in knowing them as animals, but not yet as rational animals. So long as these generic forms are in a sense virtually present in substances, our confused or imperfect understanding would to some extent track reality, while failing to do so with complete determinateness.

This last case can be generalized into a broader category of intellectual error: while having the form itself in our passive intellect, we might make a false judgment as to the correct definition of the form. A form or essence is defined in terms of genus and differentia. I presume that in taking the judgement that a form S is to be defined in terms of genus G and differentia, we must already have all three forms in mind. If so, we might wonder how it is that we could go wrong in formulating the definition. One

possibility is an error of identification: I might have four forms in mind, S₁, S₂, G and D, and wrongly attribute the definition of S₂ to S₁, in cases, perhaps, in which S₁ and S₂ are quite similar or nearly co-extensive in experience. Suppose, for example, that nearly all the polygons in my experience are triangles: I might confuse the definition of triangle with that of polygon. Such errors would be compatible with our being generally reliable at formulating definitions, especially after a process of careful inquiry and examination. This may involve the distinction between the *species impressa* and the *species expressa* or mental word. The formation of the mental word may involve an articulation of the definition of the impressed species, a process that is both discursive and fallible (see Kemple 217, chapter 4.2). That is, in achieving full understanding, it is not sufficient that we have intelligible species for all the forms *extra animam*: we must also be able to put these forms into their correct Porphyrean order.

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