

JOHN BURIDAN AND THOMAS AQUINAS ON HYLOMORPHISM AND THE BEGINNING OF LIFE

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Abstract: This paper examines some of the metaphysical assumptions behind Aquinas's denials that a human rational soul unites with matter at conception and that a human rational soul is capable of developing and arranging the organic parts of an embryo. The paper argues that Buridan does not share these assumptions and holds that a soul is capable of developing and arranging organic parts. It argues that, given hylomorphism about the nature of organisms, including human beings, Buridan's view is philosophically superior to Aquinas's in several respects. Finally, the paper poses an apparent inconsistency between several of Buridan's texts on this topic and attempts to show that the inconsistency is merely apparent.

When does life begin? If you're a hylomorphist about living things, you'll answer that it begins when a substantial form, or soul (of some species of living thing), unites with properly disposed matter. And when does this happen? Hylomorphists offer conflicting accounts. In this paper I will examine the account of John Buridan, a fourteenth century secular arts master who taught for many years at Paris.¹

John Buridan is worth asking because his answer avoids one of the theoretically inelegant features of one prominent version of medieval Aristotelian embryology. This feature has it that ensoulment cannot occur until an embryo has more or less its full complement of organic parts. For Aquinas, the immediate result of the activity of a man's sperm on a woman's menstrual fluid is indeed a life, but not a *human* life. It is a merely vegetative proto-human life, with a proto-human vegetative soul whose special mission it is to differentiate menstrual material into proto-human body parts and do all other such things requisite for the proto-human vegetative life to become properly disposed to receive—not yet a human rational soul but—a sensitive proto-human soul. The merely vegetative proto-human soul makes way for the sensitive proto-human soul, such that the first proto-human life is destroyed at the moment the second is generated. This sensitive soul completes the work begun by the vegetative soul: it continues

¹ For more on Buridan in general, see [Zupko 2003](#); [Zupko 2011](#); [Klima 2008](#).

to differentiate and organize its material into proto-human body parts (now capable of more sophisticated functions) and do everything else needed to make this new life properly disposed for receiving, finally, the rational soul. At the advent of the rational soul the sensitive soul recedes, the sensitive proto-human life is corrupted, and a human being is generated (Aquinas, SCG II.89).² This happens over the span of about forty days (Aquinas, *Sent.* III.3.5.2.corp.).³

Aquinas's embryology has received considerable attention in recent years, including the well-known exchange between [Pasnau \(2002, 2003\)](#) and [Haldane and Lee \(2003\)](#). This attention is not likely to wane. Fabrizio Amerini's (2013) recent study, *Aquinas on the Beginning and End of Human Life*, offers a dispassionate and thorough examination of the relevant texts, showing that even the oddest features of Aquinas's embryology, including the one described above, are deeply rooted in not-quite-so-odd convictions about the nature of material substance and its essential parts, prime matter and substantial form. Speaking now for myself rather than for Amerini, the dependence of Aquinas's embryology on Aquinas's distinctive conceptions of substance, matter, and form, together with the failure of that embryology, suggests that Aquinas's theoretical troubles are at bottom metaphysical rather than biological and this in turn suggests that the thing to be done for the modern follower of Aquinas is not to patch up the embryology while retaining the metaphysics, but to tweak the metaphysics (still remaining, as Buridan does, in the broad camp of unitarian hylomorphism)⁴ in a manner that yields a more cogent hylomorphic embryology.

Any hylomorphism about human beings has got to hold that a human substantial form or soul has something to do with a thing's becoming a human being. For Aquinas, ensoulment and therefore hominization occur only when a body able to support all the functions of a human being is made ready for it. This view leads to the complicated tale about proto-human organisms told above. So why not hold instead that ensoulment and hence hominization occur at conception (or thereabouts), that is, why not just say that a human rational soul is there from the beginning (or thereabouts), differentiating matter into human body parts and doing everything else needed for there to emerge from the womb in nine months a (roughly)

² SCG = *Summa contra gentiles* (Aquinas 1975).

³ *Sent.* = *Scriptum super Sententiis* (Aquinas 2001). For Duns Scotus, ensoulment is similarly delayed but instead of proto-human vegetative and sensitive organisms, he thinks that the various organic parts gradually develop until they are ready to receive a soul and become the parts of a full-fledged organism (*QMet* VII.20, 1998). *QMet* = *Questions on the Metaphysics of Aristotle* (Duns Scotus 1998).

⁴ Unitarian hylomorphism is the sort of hylomorphism according to which no material substance has or can have more than one substantial form. Pluralist hylomorphism holds that some material substance do and can. For introduction, consult the classic: [Zavalloni 1951](#).

nine-month-old human being?^{5,6} John Buridan says this, or something like this. This paper examines his answer, along with some of the reasons why Aquinas held this simple, elegant answer to be *responsio non grata*. I start by describing some of the relevant features of Buridan's hylomorphism and its relationship to other scholastics' hylomorphism. Then I examine Aquinas's reasons for rejecting immediate ensoulment, arguing that these reasons are not persuasive. My aim in this part of the paper is not to give an exhaustive analysis of Aquinas's views on this topic, nor to discuss the various ways in which these have been interpreted. Instead, I present and criticize just those aspects of Aquinas's views that are relevant to setting the stage for the claims I wish to make about Buridan's account of the soul. I move on to examine the textual evidence for the view I am attributing to Buridan and close by posing an apparent inconsistency between several Buridianian texts on this topic and attempting to show the inconsistency is merely apparent.

1 Situating Buridan's Hylomorphism

At the outset it will be helpful to spell out some of the distinctive and salient features of Buridan's hylomorphism which enabled him to take the stand he did about the soul's role in embryological development. Specifically, Buridan thinks that for any material substance, s , s is a composite of exactly one substantial form, f , and prime matter, m , where m has its own actuality, is the immediate subject of some accidents, $a_1 \dots a_n$, and where $a_1 \dots a_n$ dispose m to receive f .

1.1 Unitarianism about Substantial Form

Medieval hylomorphists were divided into two broad camps, unitarians and pluralists. The most famous unitarian is Aquinas and the most famous pluralists are Duns Scotus and Ockham. Unitarians thought that material substances have and can have just one substantial form. Pluralists thought that material substances can and sometimes do have more than one substantial form. Speaking loosely, pluralists were motivated to save the appearances that, for example, the corpse of Socrates is the very same body

⁵ Strictly speaking, I am not interested here in defending the claim, or in arguing that Buridan defends the claim, that human life begins at conception; that is a different, though obviously not unrelated, project. Instead, I'm interested in the idea that the human soul can play an overseeing or organizational role in the development of the embryo from some stage prior to the formation of organs.

⁶ Human souls, unlike the souls of all other organisms, were understood to be created directly by God at whichever moment of embryological development a genuine human being begins to exist. The souls of other organisms, by contrast, came about through natural efficient causes. In this paper I mostly discuss human beings, but since God's special creation of human souls is not relevant to my criticism of Aquinas or advocacy of Buridan, most of what is said here about human souls applies to the souls of other organisms as well.

that was once alive when it was the body of Socrates; and that a kidney removed from a donor and waiting in an organ bank to be implanted in a patient, really is a kidney and really is the very same kidney that used to be in the donor and that will be in the patient. One way, and according to some the only way, to save these appearances is to say that some parts of a material substance, such as the kidney of the donor and the body of Socrates, have their very own substantial forms and therefore some material substances have more than one substantial form: the donor has (at least) a soul and a substantial form of a kidney, and Socrates has his soul and a substantial form of his body. Medieval pluralists who thought that organic parts such as kidneys have or might have their own substantial forms include Henry of Harclay (*Ordinary Questions*, q.8, [2008]), Petrus de Trabibus (Huning 1968), Peter John Olivi (*II Sent.*, q.51, [1922]), Albert of Saxony (*De gen. et corr.*, I.5, [1516]), and John Duns Scotus (*QMet*, VII.20). Unitarians, by contrast, were motivated to preserve the unity of material substances and accused pluralists of being unable to account for how a pluri-formed substance was genuinely one substance (Zavalloni 1951; Adams 1987, 633–670).⁷ Buridan argues, as many before him did, that pluralism reduces all generation and corruption—the coming to be and passing away of substances—to alteration—the accidental modification of one and the same substance. Additionally, and relatedly, he argues that what we rightly take to be substantial forms, things like souls, would turn out to be accidental forms in the pluralists’ ontology, since a soul would begin to inhere in an already-constituted substance (a body, for example) (*DGEC.*, I.8).⁸ The details of the arguments for and against unitarianism and pluralism have been examined elsewhere and don’t need to detain us here. Let it suffice to say that Buridan was a unitarian.

1.2 Actuality of Prime Matter

Another medieval debate concerned the ontological status of prime matter. Famously, Aquinas holds that prime matter is pure potency, and that form makes matter actual (*Sent.* II.17.1.2.corp.). Scotus clarified that “pure potency” could be understood in two ways: pure objective potency, and pure subjective potency. Objective potency is the sort of potency a thing or essence has to come into existence. Antichrist does not and has not existed, but can (and will) exist and therefore has objective potency. Subjective potency is the sort of potency an existing subject has to receive forms. Prime matter is pure *subjective* potency, since it’s the theoretical entity at the bottom of an ultimate analysis of the layers of subjects of forms and therefore can take on any substantial form. But it’s not pure *objective*

⁷ More recent work that approaches the unitarianism/pluralism debates from issues in the philosophy of mind rather than the metaphysics of ordinary objects can be found in Perler 2013.

⁸ *DGEC* = *Quaestiones super libros De generatione et corruptione Aristotelis* (Buridan 2010).

potency, because it *is*, it's an entity, it's a part of a composite substance, it persists through substantial change, and so on. How could it do all these things if it weren't actual prior to being informed by form (*Lectura*, II.12, [1950–])? Again, the details of the arguments for or against different views about the ontological status of prime matter need not detain us. Let it suffice to say that Buridan follows Scotus rather than Aquinas in holding that there is a sense in which prime matter is actual all on its own (Buridan, *DA*, II.1.17),⁹ and by divine (though not by natural) power could exist without being informed at all (*DGEC*, I.7; *Ph.* I.20; King 2001).¹⁰

1.3 Prime Matter as Immediate Subject of Accidents

Medievals also debated whether or not prime matter could be the immediate subject of accidental forms, without the mediation of substantial forms. The standard line is that accidents are modifications of substance and could only inhere in substances. Eucharistic considerations in Christian Europe complicated *Categories*-based ontology, which led to the astonishing views that accidents could inhere in no subject at all, and that accidents could inhere in accidents which themselves inhere in no subject at all. Given this dogmatically inspired step away from the Aristotelian orthodoxy that accidents depend on *substances* for their existence, it is not a strenuous leap from this to the relatively tame thesis that some accidents can and do inhere directly in *prime matter*—if accidents can exist without inhering in anything at all, why can't they exist and inhere in something besides substance? Unlike non-inhering accidents, however, natural-philosophical rather than dogmatic reasons lead to the view that some accidents can inhere directly in prime matter: Buridan would appeal to them as a way of getting around the corpse-similarity objection of pluralists about substantial form (*DA*, II.2.12; *DGEC*, II.7.224–228). How is it that the corpse of Socrates looks so very much like Socrates? No problem: many of his accidents inhered in prime matter and these persist, as Socrates's prime matter persists, through the corruption of Socrates.

1.4 The Informing Relationship

Finally, by way of background, it will be helpful to say something about what Aristotelians who hold that prime matter has its own actuality mean when they say that substantial forms inform matter. The basic idea is that matter is potency and that form is act, and form actualizes matter's potency. The actuality of form and the potentiality of matter are supposed to be

⁹ *DA* = *Quaestiones super libros De anima* (Buridan Unpublished). “In one way, ‘act’ signifies the same thing as ‘a thing that is, and not only can be’, and ‘potency’ signifies ‘a thing that can be.’ And in this way every being is an act. Hence, in this sense, even prime matter is an act and in actuality and not only a potency or something in potency. For it not only can be, but in fact is” (trans. G. Klima [unpublished]).

¹⁰ *Ph.* = *Subtilissimae Quaestiones super octo Physicorum libros Aristotelis* (Buridan 1509).

theoretical primitives, so we cannot hope for an answer to the question, “Why is form act and matter potency?” But despite the primitivity of act and potency it is possible through examples to get a better sense of what Aristotelians mean when they say that form actualizes the potentiality of matter. Take some clay. It is the subject of a range of modal properties. One of these is *can be formed into a statue of Aristotle*. Now if you believe that then it should be totally harmless to think that the clay has the *potential* to be formed into a statue of Aristotle. It *actualizes, realizes*, this potential when a sculptor shapes it into a likeness of Aristotle. So the sculptor gets to work and we now have a statue of Aristotle. The sculptor is part of the explanation of how the clay was made into a statue, but so is the form imposed on the clay by the sculptor. The former provides an efficient-causal explanation while the latter provides a formal-causal explanation. Now why should we reify this form imposed on the clay? As an answer note that we have good reason to think that the clay is not identical with the statue because they differ in properties. But they share all of their material parts (all of their “spatiotemporal parts” as contemporary folk are wont to call them). So something besides material parts must explain how they are not identical. Enter reified form. The statue has all the same material parts as the clay, but it has one part that the clay does not have: a form. So by reifying form we get a nice account of what makes the difference between the statue and the clay.¹¹

1.5 Static Versus Dynamic Forms

Things are trickier when we move away from a *static* conception of form as shape or structure and toward a *dynamic* conception of form, such as a soul, which is supposed to be that which makes matter not just into a material object with a certain kind of shape, but is in Aristotle’s phrase an organism’s *principle of life*. Soul is supposed to explain not just the synchronic organization and structure of a living thing—the view of the human animal obtained by looking at the pictures in *Gray’s Anatomy* (the book not the TV show)—but its diachronic developmental and essential activities, (in the case of a human) its characteristic vegetative, sensitive, and rational activities, along with the structured series of developmental

¹¹ In this example I am ignoring the important distinction between substances and artifacts and the claim about forms frequently associated with this distinction, namely, that the form of an artifact is an accidental rather than substantial form. Strictly speaking, Aristotle would hold that the clay and the statue are the same substance but that the statue is an accidental unity of the clay and an accidental form of the statue, whereas the clay is the subject of inherence of the accidental form of the statue. Where the form in question is not an accidental form, such as the form of a statue, but a substantial form, such as an animal soul, the hylomorphist explains the difference between an organism and the body of an organism as the former’s being a substantial unity of soul and body and the latter’s being the subject informed by the soul.

changes that are movements *toward* biological maturity rather than a mere succession of changes.

If you're a hylomorphist you might naturally deploy your theory in the following way. You might think that since at the moment of conception an end-directed sequence begins—the sort of sequence you can read all about in books on the subject written by scientists for doctors—there is from that moment a soul united with matter which is guiding or arranging this sequence, from zygote to embryo to fetus to newborn and on. Buridan would back you up, but Aquinas would oppose you.

2 Aquinas Against Immediate Ensoulment

Aquinas thinks that it is not the soul but sperm, and specifically sperm's "formative power," which is responsible for overseeing the gradual development of the organism into a sensitive proto-human properly disposed for receiving an intellectual soul. This gradual process involves a series of corruptions and generations: the corruption of the sperm and the generation of a vegetative organism, the corruption of this vegetative organism and the generation of a sensitive organism, and finally the corruption of this sensitive organism and the generation of a rational animal, a human being. The formative power of the sperm remains after the corruption of the sperm, and continues to oversee development until the advent of the rational soul (*SCG* II.89). This advent happens at around forty days for boys and ninety days for girls (*Sent.* III.3.4.2.corp.). Since by this time the embryo has all the parts a mature human has, no other development is needed except growth—and Aquinas argues that souls do have the power to oversee growth, for example by disposing and then informing alien matter such as food (*ST* I.119.1).¹²

2.1 No Development Power

Why does Aquinas feel compelled to deny that souls can oversee embryological development? Why is he driven to posit this "formative power," an exceedingly mysterious power that apparently can survive the destruction of its subject, the sperm?¹³ An extended quotation will be helpful here:

[T]he very same power which is separated, together with the semen, and is called the *formative* power, is not the soul, nor does it become the soul in the process of generation;

¹² *ST* = *Summa theologica* (Aquinas 1981).

¹³ The mystery is not unique to Aquinas; the difficulties arising from trying to give a hylomorphic account of sperm's role in embryological development are first raised by Aristotle: "There is a considerable difficulty in understanding how the plant is formed out of the seed or any animal out of the semen (*On the Generation of Animals*, II.1, 733b24–25 [Aristotle 1984]). In the ensuing discussion Aristotle develops the antecedent to Aquinas's 'formative power'; see especially *On the Generation of Animals* II.3.

but, being based, as on its proper subject, on the vital spirit which the semen contains as a kind of froth, this power is responsible for the formation of the body so far as it functions by virtue of the father's soul, to whom generation is attributed as the principal agent, and not by virtue of the soul of the subject conceived, even after the soul exists in that subject; for the latter does not generate itself, but is generated by the father. And the truth of this becomes quite clear if we survey the powers of the soul one by one. For, indeed, the body's formation cannot be attributed to the soul of the embryo by reason of the *generative* power; not only because that power does not function until the powers of nutrition and growth, which are its auxiliaries, have completed their work—for the generative function is the prerogative of that which already exists as a complete being—but also because the generative power has as its object, not the perfection of the individual itself, but the preservation of the species. Nor can the body's formation be attributed to the *nutritive* power, whose function is to assimilate nourishment to the subject nourished; and this is not the case here, since in the process of formation the nourishment is not assimilated to something already existing, but is brought to a form more perfect in character and more closely resembling the father. So, neither can the formation of the body be ascribed to the *power of growth*, whose proper function is to produce change, not in the form, but only in quantity. And the *sensitive* and *intellective* parts clearly have no operation appropriate to such a formation. It therefore remains that the formation of the body, especially as concerns its primary and principal parts, is not due to the soul of the thing generated, nor to a formative power acting by virtue of the soul of the generated subject, but to a formative power acting by virtue of the generative soul of the father, the work of that soul being the production of that which is specifically like the generator. (SCG, II.89.8)

Aquinas begins by stating his own view and then offering reasons for rejecting the view I will be attributing to Buridan. Aquinas's own view is that the sperm of the father, in which the soul of the father exists "virtually" and which therefore is supposed to be an extension of the father's own agency, is the subject of a special kind of formative power which is responsible for the formation of the body. This formative power remains even after the sperm has been corrupted, but the formative power is not and never is a

power whose subject is the embryo.¹⁴ And why should we hold that there is such a subject-less formative power, rather than that the soul itself has such a power to form its bodily members? Here's the structure of Aquinas's argument: the power to oversee embryological development or formation cannot plausibly be identified with any of the powers of the soul, so it is not a power of the soul. These powers of the soul are: generative power, nutritive power, power of growth, sensitive power, and intellectual power. Generative power is the power to procreate; nutritive power is the power to perform basic biological functions such as digestion; sensitive power is the power to sense, etc. The problem here is that Aquinas offers no argument for this closed canon of powers. Out of theoretical exigency why can't we just include developmental power on a list of powers of the soul?

2.2 Improperly Disposed Matter and a Form not Admitting of Degrees

Aquinas doesn't answer, but he has additional reasons for thinking that the rational soul could not inform the embryo until the embryo had more or less the shape, structure, and parts of a (tiny) mature human. One reason is that before the fortieth (or ninetieth) day, the embryo is not *properly disposed* for receiving the intellectual soul. As Aquinas says, “[S]ince the soul is united to the body as its form, it is united only to a body of which it is properly the act. Now the soul is the ‘act of an organic body.’ Prior to the organization of the body, therefore, the soul is not in the semen actually, but only potentially or virtually” (SCG, II.89.3). (The virtual presence of the soul in the semen is not the virtual presence of the rational soul of the soon-to-be-generated offspring, but the virtual presence of the rational soul of its father.)

Aquinas thinks it follows from “the soul is the actualization of an organized body” that “the soul cannot inform a non-organized body.” In at least one important sense this is clearly true. A human rational soul can't inform a pocketknife or a swimming pool or a fountain pen. It can only inform a certain kind of organic stuff produced by a human male and female. But there is another sense in which it's not at all clear that the inference is good. Why can't we say both that the soul is the actualization of an organized body *and* that it informs and organizes the body it actualizes? The reason, presumably, is that with the important exception of intellectual activity the rational soul is dependent on a human body for actualizing its various powers (the soul has sensitive power, for example, but it does no sensing while separated from the body) and an early-stage embryo just lacks the sort of equipment a rational soul needs

¹⁴ For extended discussion (with criticism) of Aquinas's understanding of sperm's formative power, see [Amerini 2013](#), 84–99. Amerini also attends to the slight development in Aquinas's characterization of the formative power; none of these developments, relative to the view expressed in SCG II.89, are relevant to the issues raised in this paper.

in order to do its characteristic activities.¹⁵ This in itself doesn't render impossible the thought that the rational soul informs an embryo at a very early stage, but it does render it wasteful, since it would posit a soul-matter union in which the soul did nothing except wait around for its matter to become suitably organized. The problem here, again, is that it assumes without argument that *overseeing the development of an embryo* is not one of the rational soul's powers. Given this overseeing power, early ensoulment is not theoretically wasteful. And Aquinas himself implicitly grants that the soul retains its powers even if the organism of which it is the soul cannot exercise certain powers; for example, boys and girls and human adults past reproductive age all alike have human souls and therefore have all the powers of a human soul, including reproductive power, despite their inability to exercise it.

Aquinas also opposed early ensoulment on the grounds that, so he thought, early ensoulment would entail that the *soul itself* undergoes development along with the embryo whose soul it is. As Bernardo-Carlos Bazán has put it,

Saint Thomas labors under a hypothesis without foundation. He believes that if one affirms the existence of the rational soul from the first instant of the embryonic process, while holding the gradual appearance of operations as the development of the organs allows, one ends up affirming at the same time the theory of the degrees of one and the same form. We do not see this following as a consequence. One can perfectly affirm that the rational soul exists in the embryo and that it does not exercise all its operations for want of the necessary organs, as is the case with the mentally sick. (Bazán 1983, 391–392)

According to Bazán, one reason why Aquinas denies immediate ensoulment is that he thinks it follows from the thesis of immediate ensoulment that the soul itself would develop (the “theory of degrees” mentioned in the quotation) as the embryo as a whole develops. Aquinas is certainly clear that substantial forms cannot exist in degrees; differences in degrees of soulish perfections always signal differences in *kind* and never in *stages* of soulish maturation (SCG II.44; Amerini 2013, 32, n.30). But Bazán's point is that the rejection of the theory of degrees is simply not relevant to the debate about immediate ensoulment, since the proponent of immediate ensoulment claims that the *embryo* develops gradually, not the soul. (And, Buridan adds, the soul oversees this gradual development.)

Granting this power to the soul has a number of theoretical advantages. It disposes of the need for a “formative power” which is able to survive the destruction of its subject, sperm. It disposes of the need for one or more proto-human souls, such as vegetative and sensitive souls, to hold down

¹⁵ Here Scotus agrees with Aquinas (*Ordinatio* IV.11.1.2.1.284 [Duns Scotus 1950–]).

the embryological fort until the rational soul arrives. It disposes of the need to posit metaphysically gauche proto-human organisms that are organisms but no kind of organism. And it provides a clear and coherent account of the continuity and identity of the embryo with the human being.¹⁶ Buridan grants this power to the soul.

3 Buridan on Embryological Development

In Book I Question 8 of Buridan's commentary on Aristotle's *On Generation and Corruption* he asks whether in a living thing there is a substantial form other than the soul. He thinks there isn't. He reasons that if one substance had two or more substantial forms, they would have relations of potency and act with respect to one another. Suppose that, for example, there were distinct substantial forms of nerve and bone, and in addition to these the soul of the organism. Buridan reasons:

If you posit bone and nerve to have different substantial forms, according to the difference of their mixtures, then I ask concerning the form of bone and the soul whether the soul is related to the form of bone as act and the form of bone as potency, or the converse. If you say that the form of bone is as act with respect to the soul, something unfitting follows, namely that the form of bone will be more perfect than the soul itself, because it will be its substantial perfection. If you say the converse, something else unfitting follows, because by the soul the embryo is substantially generated and lives, before bones are made or before there are bones; thus the form of bone comes after the soul; but the subject related to its actuating form does not come after that act [i.e., the actuating form]. (*DGEC*, I.8,84)¹⁷

¹⁶ Amerini is at his most critical of Aquinas about what he perceives as Aquinas's failure to offer such an account. He draws a "decidedly negative" conclusion from his discussion of Aquinas's somewhat slapdash attempts to account for the continuity and identity of the embryo and human being.

The embryo and the human being cannot be said to be identical because of the substantial form or because of the matter, whether this be individual or specific, or because of three-dimensional extension or because of the quantity of the matter. Nevertheless, it remains true that they are the same subject. This can be derived from the fact that, metaphysically, the embryo is in potency to a human being so that a human being is what an embryo is in act, as well as from the fact that the process of generation is indivisible over time, and so if we had at hand a procedure that allowed us to follow, step by step, the history of the embryo, we would realize that what is involved is always *one and the same* subject. (Amerini 2013, 163, italics Amerini's)

¹⁷ [S]i tu ponas os et nervum habere formas substantiales diversas secundum diversitatem mixtionis eorum, tunc ergo quaero de forma ossis et de anima utrum anima sit respectu

The form of bone cannot be act with respect to the soul's potency, because it is less perfect than soul, that is, it is no perfection of soul; there is no potentiality in soul to become boney. Now you might think that bones do have a potentiality to become ensouled—*can these bones live?* God asks the prophet (*Ezekiel 37:3*). But whatever Buridan's answer to the biblical question, we know that he denies that the form of bone is in potency to the soul. Crucially, Buridan says that when the embryo is first generated upon the advent of the soul, *the embryo has no bones*. So how do the bones develop? What I would like Buridan to say is that the soul somehow *causes* there to be bones, that as the soul guides embryological development it differentiates matter into various organs, including bones, and arranges them appropriately. But he doesn't say this exactly. He doesn't say that bones are *caused by* the soul, but he does say that they *come after* the soul:

I show from what was said that the form by which bone is called bone is an accidental form because all seem to grant that the soul in an animal is the final substantial form, if there are in it several substantial forms. Therefore, those [forms] which come after the soul are accidental forms, if they are distinct from the soul. But the disposition[s] by which bone is called bone or by which nerve is called nerve and a hand a hand, come after soul comes, namely to an embryo already living. Therefore, these dispositions, if they are distinguished from the soul, are accidental forms. (DGEC, I.8.84–85)¹⁸

Here Buridan says that there are *dispositions* by which bones and nerves and so on are what they are. Either, he says, these dispositions are accidental forms, or they are indistinct from the soul. The first sentence of this quotation clearly says that the forms of bones (etc.) are accidental forms. But in the second and the last sentence of this quotation he qualifies: these dispositions, *if they are distinguished from the soul*, are accidental forms. If they are not distinguished from the soul, then I take Buridan to mean that bones (etc.) come to be because the soul has certain dispositions such that the soul forms bones (etc.) when it informs matter. If they are distinguished

formae ossis sicut actus et forma ossis sicut potentia, vel e converso. Si dicis quod forma ossis sit tamquam actus respectu animae, sequitur inconveniens, scilicet quod forma ossis erit perfectior quam ipsa anima, quia erit substantialis eius perfectio. Si dicis e converso, sequitur aliud inconveniens, quia anima substantialiter generatur et vivit embrio, antequam ossa fiant sive antequam sint ossa; et sic forma ossis advenit post animam; modo subiectum respectu formae actuantis ipsum non advenit post illum actum. (Translation mine.)

¹⁸ Probo ex dictis quod forma qua os dicitur os est forma accidentalis quia: omnes videntur concedere quod anima in animali sit forma substantialis finalis, si ibi sint plures formae substantiales; igitur ea quae adveniunt post animam sunt formae accidentales, si sint distinctae ab anima; sed dispositio qua os dicitur os vel qua nervus dicitur nervus et manus manus, adveniunt post adventum animae, scilicet embrione iam vivente; igitur hae dispositiones, si distinguantur ab anima, sunt formae accidentales. (Translation mine.)

from the soul and are accidental forms, then we're left to wonder what role, if any, the soul plays in disposing matter for the reception of these accidental forms. Would bones come to be in just that matter if the soul weren't informing that matter? Buridan doesn't say. But it doesn't seem too scandalous an interpretive stretch to answer on his behalf: of course not. Bones develop in living things, and living things are living because they are *animata*. The quoted text doesn't yield a determinate view about whether the form of an organic part of an animal is the soul itself (which has a disposition the manifestation of which includes the formation of just that organic part) or an accidental form. Either way, however, the thesis I'm attributing to Buridan stands: the presence of the soul in matter plays a role in the development of an organism's organic parts.

3.1 Soul's Production of Organic Parts

In Book II Question 4 of the *De Anima* commentary Buridan says that a certain kind of soul (say, a fish soul) will *produce* the sort of body parts (e.g., fish parts) associated with an individual of that kind: "Again, these people claim that the vegetative soul is of the same nature in man, horse, fish and worms; but this is very implausible, because then it would have to nourish in the same way and produce the same sort of flesh and form similar members, which is clearly false" (*DA*, II.4.19).¹⁹ Buridan's main point here is not to advance the thesis I'm attributing to him—his point here is to argue that vegetative souls are of specifically different kinds—but the argument reveals a bit about what Buridan thinks the soul does for an organism: it *nourishes*, *produces flesh*, and *forms members*. What is supposed to be "clearly false" here is *not* that souls perform these developmental activities but rather that these activities are exactly the same in different kinds of organisms. Buridan simply takes it for granted that souls *do* perform these activities. By contrast, as we have seen, Aquinas thought that souls (including the intellective soul and the proto-human sensitive and vegetative souls) have no role whatsoever in the development of an organism—this job belongs instead to sperm's formative power.

3.2 The Homogeneity Principle and the Production of Organic Parts: An Inconsistency?

That Buridan thinks that a soul (of a certain species) produces organic parts (associated with that species) seems inconsistent with Buridan's Homogeneity Principle about souls. The name of the principle is due to Zupko (1993). The Homogeneity Principle says that all souls, human or otherwise, are

¹⁹ Item isti ponunt animam vegetativam esse eiusdem rationis in homine, equo, pisce et verme, et hoc est valde inconveniens, quia tunc consimiliter deberet facere nutritionem et consimilem carnem facere et consimilia membra formare, quod est manifeste falsum. (Trans. Klima, unpublished.)

homogeneous. Something is homogeneous in the relevant sense if it either lacks proper parts or is such that all of its proper parts are of the same kind. Human intellectual souls are homogeneous in the former sense: they differ from the souls of all brutes and plants in that they have neither essential nor integral parts. So wherever we're inclined to say a human soul is—at every place my body is, for example—we've got to be able to say that my whole soul is there. The medieval tag for this sort of relation of soul to body is *whole in whole, whole in every part*. The souls of plants and brutes are homogeneous in the second sense: unlike human souls they have parts. So wherever we're inclined to say that an animal's soul is—at every place its body is, for example—we're going to say that a part of that animal's soul is there. The medieval tag for this sort of relation of soul to body is *whole in the whole, part in every part*. Since any part is exactly the same in kind as every other part, however, we can say that all the powers of the soul are present to every part of the body. In this respect, therefore, all souls are on par: whether a soul is *whole in whole, whole in part, or whole in whole, part in part*, all its *powers* are in every part. So can the foot see? *Sic et non*. Since all the powers of the soul are present to the foot, the power to see is present to the foot. But since the foot is not structured for seeing, the power to see cannot be exercised in the foot. Buridan distinguishes remote from proximate powers and says that in the foot there is a remote but not proximate power for seeing (*DA*, II.5.22; Zupko 1993). Having a proximate power—the sort of power for seeing that is in the eye instead of the foot—is therefore due not just to the soul, it seems, but to the soul together with a suitably structured organ.

The Homogeneity Principle principle challenges my interpretation of Buridan's account of the soul's role in embryological development in the following way. On my interpretation of Buridan, that some part of matter develops into, say, an eye rather than a foot, is due to the soul's formative and organizational power to produce an eye, rather than a foot or anything else, just where an eye should be and just at the time an eye should develop, given the kind of organism of which that soul is the soul. But if souls are homogeneous (in either sense discussed above) such that all the powers of a soul are present everywhere the soul is, then eye-forming power and foot-forming power, and every other power of the soul, are present in all parts of matter the soul informs. What we need then, is some account, consistent with the Homogeneity Principle, of just how the soul's powers are expressed differently in different parts of the organism it ensouls.

It might be tempting to give credit to the *body* or *matter* for the organic structure that a soul, when united to the body, *uses* to express its powers. But this leaves unexplained how it is that matter acquires this structure. It can't do it on its own—of itself prime matter is pure (subjective) potency. So whatever does it is on the side of form/soul, and I have argued that this is in fact what Buridan thinks. But if souls are homogeneous, then how

can we explain how the soul organizes some matter into an eye and other matter into a foot?

I know of no text in which Buridan resolves this issue, but I think it's solvable on Buridanian principles. Granting the soul the power to oversee embryological development entails granting it the power to develop the various parts of an embryo, and therefore (limiting ourselves to humans and relevantly similar animals) the power to develop eyes and feet. By the Homogeneity Principle these powers are in every part of the soul. What we need, then, is an explanation of how the soul's power to develop an eye develops eyes just *here and here* and not everywhere. And this is easy: since, as noted earlier, Buridan holds that some accidents can and do inhere directly in prime matter, we can just say that various accidental dispositions of the matter the soul informs are more or less apt for being developed into an eye (or a foot, etc.), such that the soul develops an eye in matter just in the part of matter disposed to become an eye. Wherever a soul is in matter all its powers are there, but *what happens* in this part of matter is partially dependent on the dispositions of this part of matter.

3.3 Organizing the Organic Parts

But we'd also like an explanation of how the soul, under normal conditions, makes it turn out not only that all the organic parts get developed but that they get *arranged* in the right way. Buridan's souls can't do this. Instead, prior to ensoulment matter is disposed for receiving a soul in such a way that, upon the advent of the soul, the soul's developmental powers produce not just all the organic parts but produce them all in just the right places (under normal conditions). Placing the right dispositions in matter and educating soul from matter's potency is, according to Buridan, a coordinated effort of, in the case of human procreation, father (and mother), sperm, and the sun, with God as the principal agent (*DGEC*, II.12.249–255). Once the soul comes to exist in the matter, it produces all the parts needed for its normal functioning from the material dispositions with which the organism was endowed at its genesis. (Imagine a hunk of matter with one part having just the right dispositions to develop into a foot, adjacent to it another part with the right dispositions to develop into an ankle, adjacent to it another part disposed to develop into a leg, and so on and forth for the whole body.) Matter's having the right dispositions for receiving a soul (of some species) involves, therefore, not just the dispositions needed to develop an eye, a foot, a heart, and so on, but having these dispositions arranged in just the right way.

4 Conclusion

So here's the big picture view I'm attributing to Buridan: the soul has a power that Aquinas did not recognize, the power to oversee embryological

development. Also unlike Aquinas, Buridan held that prime matter is actual on its own and is able to be the immediate subject of accidents. Thus, given suitable dispositions inhering in matter—both the right sort of dispositions and the right arrangement of these dispositions—ensoulment occurs, an organism is generated, and the process of development begins, which involves first the production of organic parts and then the maturation of these parts. Throughout this process there are no proto-humans or proto-human souls; there is exactly one substance informed at every time by one and the same soul; this substance is exactly one organism, which is (in the specific case of human generation) exactly one human being and therefore exactly one person.²⁰ It would have been nice if he had developed his ideas a little more, because the little he does say seems to me to be a deft way of taking full advantage of a hylomorphic theory of human development.

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²⁰ Since rational souls as Buridan and many other scholastics understood them are not divisible, even by God, identical twins present a tricky sort of problem. I'll not address this problem here, other than to say that since two humans entail two rational souls, and since one rational soul cannot become two, in the case of identical twins there is no human who becomes two humans. Either, therefore, ensoulment doesn't occur until after the split, or there is a double-ensoulment of one undivided material subject which splits as a result of this double-ensoulment. I'm inclined to the latter view, but I suspend my judgment here and bid my readers to take their rabbit hole of choice.

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