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Animals, Animal Parts, and Hylomorphism: John Duns Scotus's Pluralism about Substantial Form

THOMAS M. WARD*

THIS PAPER EXPLORES SOME ASPECTS OF John Duns Scotus's (c. 1266–1308) metaphysics of parts, focusing on the parts of animals, and develops a view about Scotus's answer to the question, "How do organic parts—things like bones, flesh, hearts, livers, eyes, teeth, hands, and so on—compose one substance, an animal?"¹ Like many medieval philosophers, Scotus is a hylomorphist about substance: he thinks that a substance is a composite of matter and substantial form, and he thinks that the substances include organisms like plants and animals, inorganic compounds such as bronze, and what he recognizes as the basic elements of such compounds: earth, water, air, and fire.² Scotus and others in the medieval period call matter and substantial form the "essential parts" of a substance. Scotus is also a pluralist about substantial forms: he thinks that living composite substances are composed of matter and more than one substantial form.³ According to the common scholarly view, these substantial forms are a soul and a form of corporeity, where the form of corporeity is supposed to be the substantial form by which an

¹Thanks are due to Marilyn McCord Adams, Calvin Normore, John Carriero, Richard Cross, Brian Copenhaver, Scott Williams, Martin Tweedale, Sean Kelsey, and an anonymous referee for helpful criticism and discussion of earlier versions of this paper. All translations of Latin are my own except the translations of *De Primo Principio*, which are slightly modified versions of Wolter's, and where otherwise indicated.

²Scotus also thought that there were immaterial substances, but for present purposes we can ignore these. In this paper, therefore, by 'substance' I just mean "material substance."

³Every medieval hylomorphist thought that there was a plurality of forms in a substance, i.e. at least one substantial form and many accidental forms, where accidental forms *modify* a substance and a substantial form (together with matter) *composes* a substance. In this paper I am not concerned with accidental forms except in an incidental way, so unless otherwise specified by 'form' I mean "substantial form."

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animal is corporeal, and the soul is supposed to be the substantial form by which an animal is living.⁴ Fewer commentators have recognized that Scotus also thinks that what he and others call the “integral parts” of animals, things like livers and hearts, are themselves composites of matter and *distinct kinds* of substantial forms, a form of the liver, a form of the heart, and so on.⁵

It is not clear how this analysis of integral parts is supposed to cohere with the common view of Scotus’s analysis of essential parts, however. According to these two analyses, it appears that there is one form by which an animal is a body, and many other forms by which an animal has a heart, liver, bones, etc. But intuitively, if we have all of these integral parts, what more do we need in order to have a body? It seems redundant to suppose that the integral parts of an animal have their own substantial forms, and that there is in addition to these another form by which an animal is a body. I argue that, for Scotus, it *is* redundant to suppose this. Scotus thinks that in a process of embryological development many substances are generated—a heart, blood, a brain, and all the rest of the organs—and under natural conditions these substances can be informed by a soul. The union of these substances with the soul is the last stage in the generation of a complete organism, whereby these substances become integral parts of one animal. For Scotus there is no substantial form of corporeity whose job it is to make a substance merely corporeal. In what follows I develop and defend this interpretation of Scotus and offer an account of how Scotus thinks that many substances can be parts (“part-substances,” as I will call them⁶) of one substance.

I start by providing some of the medieval background against which Scotus formed his position. The philosophical problems motivating Scotus and his scholastic colleagues, their solutions to these problems, and the difficulties with these solutions, can appear remote to contemporary readers. It will be helpful, therefore, to begin at some distance from Scotus’s texts and gradually focus in. Scotus approaches problems with hylomorphism equipped with an analytical mind and from within a historical philosophical milieu that speculated long and hard about hylomorphism. As recent work in contemporary philosophy of mind and metaphysics has put hylomorphism on the table as a candidate solution to

⁴For some of the history of the medieval debate over the number of substantial forms in composite substances, see Zavalloni, *Controverse sur la pluralité des formes*, 213–504; Callus, “The Origins of the Problem of the Unity of Form,” 121–49; Weisheipl, “Albertus Magnus and Universal Hylomorphism,” 239–60. For some views about Scotus’s place in this history, see Gilson, *Jean Duns Scot*, 490–97; Stella, *L’ilemorfismo di Duns Scoto*, 187–229; Bettoni, *Duns Scotus*, 69; Adams, *William Ockham*, 633–70; Cross, *Physics of Duns Scotus*, 47–76; Pasnau, *Metaphysical Themes*, 581–82. Avicbron’s *Fons Vitae* is generally recognized, both by modern scholars and by scholastics such as Albert the Great and Aquinas, as the source of the pluralist view, but the view is actually much older than this, having been articulated by Alexander of Aphrodisias circa 200 AD. See Alexander, *On the Soul*, Book I, Chapter 13, 9. (Thanks go to Calvin Normore for pointing me toward Alexander.) For Avicbron’s pluralism, see Avicbron, *Fons Vitae*, Book II, Chapter 8, 37–39; and Book III, Chapter 3, ¶ 22, 81.

⁵Sharp, *Franciscan Philosophy*, 311–13; Cross, *Physics of Duns Scotus*, 68–71.

⁶A part-substance is anything that is both a part of a substance and a substance. It is an admittedly awkward expression, but does a better job of conveying my meaning than more elegant expressions like ‘partial substance’ or ‘substantial part.’

various problems, it is worth considering aspects of Scotus's formulation of the theory in some detail.⁷

I. UNITARIANISM AND PLURALISM ABOUT SUBSTANTIAL FORM

For most hylomorphists, including Scotus, it is standard to say that a living substance such as Mole⁸ is a composite of body and soul, where body is the matter and soul is the substantial form, and where soul *informs* the body.⁹ But some medieval hylomorphists would quibble with this characterization of body and soul as the matter and form of an organism. Although Aquinas sometimes says that the soul unites with the body to compose an organism, he really does not think this.¹⁰ Instead, Aquinas thinks that the soul informs prime matter, an uncharacterized substratum of substantial change. He therefore thinks that soul and prime matter, rather than soul and body, are strictly speaking the essential parts of a composite substance. All of the essential properties of a substance like Mole, not just being animate but also being corporeal—are due to Mole's sensitive soul.¹¹ This entails that Mole's body cannot exist independent from his soul, so when Mole dies his corpse is a substance (or substance-like object) both specifically and numerically distinct from Mole (and from any former part or parts of Mole). Like Aristotle, Aquinas affirms that Mole's corpse is only homonymously Mole's body, Mole's severed paw only homonymously a paw.¹² Aquinas also held that Mole's soul does not begin to inform prime matter or the body until his fetus has developed to a sufficiently advanced stage. He thinks therefore that there is some instant at which the substantial form of Mole's fetus is replaced by Mole's sensitive soul, resulting in the generation of a new substance.¹³ As for Mole, so for any composite substance:

⁷In metaphysics, hylomorphism has been offered as a way of explaining how a complex object is structured, how it is unified, how an object is distinct from that which constitutes it, and how there can be coinciding objects. In philosophy of mind, hylomorphism has been offered as an alternative to reductive materialism and Cartesian dualism. For examples of these rehabilitations of hylomorphism, see Koslicki, *The Structure of Objects*, and references therein; Johnston, "Hylomorphism"; and Lowe, "Non-Cartesian Dualism," 851–65. In future work I hope to say something about the relation of Scotus's hylomorphism to these modern varieties—but not here. Scotus is challenging enough and interesting enough to warrant a paper all to himself!

⁸Mole, of course, is the well-loved companion of Rat in Kenneth Grahame's *The Wind in the Willows*.

⁹In this section and elsewhere in the paper I will refer to the views of other philosophers in a way that is little concerned with their places in the historical development of views about the number of substantial forms. Instead I refer to them in a way that helps to bring out the philosophical issues at stake in the old debates. So, for example, I will just as soon pit Scotus (d. 1308) against Suárez (d. 1617) as against Henry of Ghent (d. 1293).

¹⁰Aquinas, *Summa theologiae*, Part I, Question 76, Article 1.

¹¹Aquinas, *Summa theologiae*, I.76.4.

¹²Aristotle, *De Anima*, Book II, Chapter 1, 412b10–24; *Meteorology*, Book IV, Chapter 12, 389b30–390a1; *Generation of Animals*, Book II, Chapter 1, 734b24–35; Aquinas, *Summa theologiae*, III.50.5, *corpus*.

¹³Aquinas, *De potentia Dei*, Question 3, Article 9, Response 9; *Summa contra gentiles*, Book II, Chapter 89, ¶ 11; *Summa theologiae*, I.119.2.

Aquinas analyses it as a composite of prime matter and exactly one substantial form.¹⁴ We can call Aquinas's view "unitarianism" about substantial form.

Other medieval hylomorphists disagree with Aquinas's unitarianism. Ockham, for example, holds that the body is itself a composite substance, composed of prime matter and a form of corporeity. Soul informs the body, making it living, but its identity as a body is independent of the soul. According to this analysis, therefore, the body persists when the organism dies; the corpse is both specifically and numerically the same body as the body of the living organism. In the case of rational animals, humans, Ockham argues that there are a total of three substantial forms: the form of corporeity, the sensitive soul, and the rational soul.¹⁵ And at least one medieval hylomorphist, Richard of Middleton, counted four substantial forms in a human: a form of corporeity together with vegetative, sensitive, and rational souls.¹⁶ For present purposes, we can consider Ockham's and Richard's views, along with others like them, a single view, "standard pluralism" about substantial form.

Scotus rejects both unitarianism and standard pluralism. In his view, the body is indeed an essential part of an organism, and in this sense he agrees with the standard pluralists against the unitarians. But Scotus denies that the body is a substance, and in this sense he agrees with the unitarians against the standard pluralists. (In section 2 I examine in greater detail Scotus's rejection of unitarianism, and in sections 3 and 4 I examine his rejection of standard pluralism.) Scotus thinks that the body is in fact composed of many different kinds of composite substances, corresponding to different integral parts, and thinks that some integral part-substances are themselves composed of integral part-substances (along with a substantial form). Following Aristotle, he thinks that heterogeneous parts—parts like faces, hands, hearts, and eyes—are partially composed of homogeneous parts—parts like bone, flesh, and blood.¹⁷ These substances compose one complete organism when they are together informed by the soul, and Scotus thinks that any organism, plant, brute, or human, has just one soul.¹⁸ We can call this version of pluralism about substantial form "Scotistic pluralism."¹⁹

¹⁴Strictly speaking, a unitarian could deny that Mole has only one substantial form, for example by denying that Mole is one substance (perhaps he is instead many substances). Traditionally, however, unitarianism as a metaphysical position was yoked with assumptions about what counted as substances: things like plants, animals, elements, and compounds of elements.

¹⁵Ockham is agnostic on the issue of whether the organic parts of animals have substantial forms of distinct kinds, but he is definitely committed to a plurality of forms. See Adams, *William Ockham*, 633–70, and references to Ockham therein. For his agnosticism about the forms of organic parts, see Ockham, *Quodlibet* III, Question 6 (OTH, IX.225–27).

¹⁶Richard of Middleton, *De Gradu Formarum*, 154–57. See also the discussion of Richard in Sharp, *Franciscan Philosophy*, 235–39, and references therein.

¹⁷Scotus, *Reportatio*, Book IV-A, Distinction 44, Question 1 ¶ 2 (Wadding, XI.854); Aristotle, *Parts of Animals*, Book II, Chapter 1, 646b11–27.

¹⁸Scotus, *Ordinatio*, Book IV, Distinction 44, Question 1, ¶ 4 (Wadding, X.98).

¹⁹Scotus is not the first Scholastic to have held that individual integral parts of an organism have their own substantial forms. The editors of Scotus's *Opera Philosophica* point us to Peter John Olivi and Peter de Trabibus as early proponents of the view (Bonaventure, IV.382, n. 5). For Peter de Trabibus, see the texts printed in Huning, "The Plurality of Forms according to Petrus de Trabibus." For Olivi, see Olivi, *Quaestiones in secundum librum Sententiarum*, Question 51. And after Scotus, Albert of Saxony seems to have held this position. In his commentary on Aristotle's *On Generation and Corruption*, he holds that in the same substance there are *plures forme substantiales partiales distincte specie existentes partes*

Scotus considers several arguments for the view that integral parts are distinct substances, not all of which he considers cogent. He presents several arguments that reason from distinction of functions and modal properties to distinction of substance, but finds reasonable rejoinders to each.²⁰ He finds surer grounds for his claim in two additional arguments. First, Scotus argues that the fact that in embryological development some integral parts are generated before other integral parts makes it probable that the coming to be of an integral part of an organism is a distinct substantial generation.²¹ Second, he argues that where two properties, *F* and *G*, cannot inhere in the same subject, then the form by which a substance is *F* is numerically distinct from the form by which it is *G*. I discuss each of these arguments in greater detail below.

Scotus recognizes that a major theoretical weakness of his view that the integral parts of a substance are distinct substances is that it is not clear how several substances should be able to compose one substance. For Aristotle and most Aristotelians, distinct objects can form a substantial unity only if one is potency and the other is act. As the Philosopher said, "A substance cannot consist of substances present in it actually (for things that are thus actually two are never actually one . . .)."²² Bronze and the form of a sphere can compose one brazen sphere, for example, because the bronze is in potency to that form.²³ For the unitarian, prime matter and substantial form can compose one substance because prime matter is in potency to substantial form. And for the standard pluralist, body and soul can compose one substance because body is in potency to soul. In Scotistic pluralism, however, the potency-act analysis of composition is inapplicable to the sort of unity that, for example, Mole's heart and liver have when they (partially) compose Mole, even though Scotus wants to say that a heart and a liver can (partially) compose one substance. Whatever potency and act amount to, neither Scotus nor any Aristotelian of whom I am aware thought that one composite substance could be in potency to another composite substance.²⁴ Scotus *does* think that the heart, liver, and other integral parts are together informed by Mole's sensitive soul, and therefore thinks that the integral parts are together in potency to the

integrales unius forme totalis [sic], and then refers the reader to his commentary on *De Anima* for his view of the soul. See Albert of Saxony, *Duos libros de generatione*, Book I, Question 5, f. 132v. Complete versions of his *De Anima* commentary only exist in manuscript form; for information about the manuscripts, see Muñoz García, "Albert of Saxony, Bibliography," 161–90. The portion of Albert's *On the Soul* commentary published by Marshall does not deliver a determinate account of Albert's pluralism (and Marshall himself is dubious about its attribution to Albert), but see Marshall, "Parisian Psychology in the Mid-Fourteenth Century," 101–93.

²⁰Scotus, *QMet*, Book VII, Question 20, ¶ 11–18 (Bonaventure, IV.382–83).

²¹Scotus, *QMet*, VII.20, ¶ 38 (Bonaventure, IV.389–90).

²²Aristotle, *Metaphysics*, Book VII, Chapter 13, 1039a3–5 (Barnes, II.1640); I quote this passage as the first objection to Scotus's view that the integral parts of animals have distinct substantial forms. See Scotus, *QMet*, VII.20, ¶ 1 (Bonaventure, IV.381).

²³Aristotle, *Metaphysics*, VIII.6.1045a21–36 (Barnes, II.1650). As for Aristotle, so for Scotus the brazen sphere is merely a heuristic tool for explaining hylomorphism: as an artifact, it is excluded from the class of genuine substances.

²⁴I qualify 'substance' with 'composite' in this sentence because Aristotle sometimes calls form and matter "substances," and by this description it would be correct to say that a substance (matter) is in potency to another substance (form). Aristotle, *Metaphysics*, VII.3.1028b33–1029a7 (Barnes, II.1624–25).

soul. But this account of the substantial union of the soul with the integral parts leaves unresolved what it is for the integral parts to be *together in potency*. Why, for example, are this heart, this liver, these bones, and so on, in potency to Mole's sensitive soul, and some other substances are not? Scotus thus presents himself with a theoretical challenge that unitarians and standard pluralists need not face. His response is that some substances can be informed by the soul if they have a special kind of unity, what Scotus calls a 'unity of order,' which is the sort of unity that things have when one *depends* on another (in a technical sense of 'depends,' which I elaborate in sections 5–7). In section 8, the final section, I reflect on some of the ramifications of the substantiality of organic parts for the function of soul.

2. SCOTUS AGAINST UNITARIANISM

Aquinas and Scotus share a commitment to parsimony in theoretical matters, and both take parsimony to be a reason in favor of unitarianism.²⁵ The unitarian thinks that a material substance, *s*, of some kind, *K*, has and can have just one substantial form, *K*-form, such that *K*-form united with the matter of *s* gives *s* all of its *essential* perfections. But Scotus argues against Aquinas that a "contradiction in being" arises on the unitarian assumption. When Mole dies, says Scotus, the soul does not remain but the body does. He concludes that the form of the body is numerically distinct from the soul.²⁶ The inference is unwarranted however, since, as Marilyn McCord Adams has pointed out, Scotus presumes what he is trying to prove: that the *body* remains.²⁷ According to the unitarian thesis, a corpse is not identical with the body or any part of the body of the organism that precedes it. Mole, body and soul, has been corrupted, and a new substance with qualitative and quantitative features very similar to Mole's has been generated—Mole's corpse. According to Aquinas, the corruption of an organism naturally tends toward dissolution into the elements,²⁸ but there are several middle stages along the way to the elements—Aquinas identifies "dead body" and "putrefied body" as two of them—and each of these stages is itself a composite of matter and some "imperfect" or merely transitional substantial form.²⁹

The unitarian, then, is not committed to a blatant "contradiction in being," as Scotus accuses him of maintaining. But in identifying Mole's corpse as a newly generated substance, even an imperfect one, the unitarian must confront two

²⁵Aquinas, *Summa theologiae*, Ia.76.3–4; Scotus, *Ordinatio*, IV.II.I.2.I, ¶ 186 (Vatican, XII.234). In *Ordinatio*, IV.II.I.2.I, Scotus argues against the views of Henry of Ghent as much as those of Aquinas. Henry of Ghent has an interesting view according to which only humans have a plurality of substantial forms. To do justice to his view and to Scotus's response to it would require more words than I can spare. As Aquinas's views are better known, and as he is the most famous unitarian, I have found it convenient to focus on him.

²⁶Scotus, *Ordinatio*, IV.II.I.2.I, ¶ 280 (Vatican, XII.265): *Sic in proposito forma animae non manente, corpus manet; et ideo universaliter in quolibet animato, necesse est ponere illam formam, qua corpus est corpus, aliam ab illa, qua est animatum.*

²⁷Adams, *William Ockham*, 648; cf. also Cross, *Physics of Duns Scotus*, 56.

²⁸Aquinas, *In de generatione et corruptione*, Book I, Chapter 8, ¶ 3; *Summa theologiae*, III.50.5, *corpus*.

²⁹Aquinas, *In de generatione et corruptione*, I.8, ¶ 3. Aquinas claims to derive his idea of imperfect forms from Avicenna's *Sufficientia*. See Avicenna, *The Metaphysics of The Healing*, Book VIII, Chapter 2, ¶ 15, 265–66.

significant challenges: explaining how the corpse comes to be, and explaining how the corpse comes to be so very similar to Mole. If the corpse is a substance and is not identical with Mole's body, it is something newly generated and therefore has an efficient cause. But it is not obvious what this efficient cause could be. Initially plausible is the suggestion that whatever is responsible for killing Mole is also responsible for generating the corpse, since in normal cases of generation an efficient cause brings about a new substance from some preexisting substance. But according to Scotus, we would expect different kinds of killers to produce different kinds of corpses, and this is often not the case: for example, whether Mole drowns, is stabbed, or dies of illness, his corpse will appear to be of the same kind, or at least of a very similar kind.³⁰

Francisco Suárez—a unitarian late in time—attempted to fill this explanatory gap in the unitarian position by claiming that “heaven or the author of nature” is responsible for providing the substantial form of Mole's corpse at the moment Mole passes away. In this Suárez was echoing a traditional way of resolving the problem of spontaneous generation, where for example maggots are generated from putrid flesh without any apparent efficient cause. The principle at work seems to be this: where no sublunary efficient cause can explain a generation, a celestial one must be posited. Given this principle, Suárez's extension of it to cases of corpse-production seems reasonable.³¹ Aquinas himself does not seem to have explicitly endorsed this view as a way to account for the generation of corpses, and I have not found any texts in which Aquinas posits an alternative theory. As far as I can tell, then, Aquinas tells us what corpses are (composites of matter and imperfect form) without telling us how they come about.³²

Second, the unitarian must explain not only how the new substance comes to be, but also how it comes to be similar to Mole—it is black, furry, and the same size and shape as Mole. According to Aquinas, accidents go down with the ship: if the substance is corrupted, so are the accidents, since accidents by nature inhere in, are individuated by, and (in nonmiraculous cases) depend for their existence on not matter but substance.³³ So in addition to holding that Mole's corpse has a substantial form that was never a form of Mole, Aquinas must also hold that all

³⁰Scotus, *Ordinatio*, IV.1.2.1, ¶ 226 (Vatican, XII.246).

³¹Francisco Suárez, *Disputationes metaphysicae*, Disputation 18, Section 2, ¶ 28, 608–9. The view that a heavenly body or God supplies what is lacking in the sublunary causal order has a long history. Aquinas offers a similar solution to the problem of spontaneous generation in *Sententia libri Metaphysicae*, Book VII, Chapter 8, ¶ 25–26. For some of the ancient context of the view, see Henry, “Themistius and Spontaneous Generation in Aristotle's *Metaphysics*.”

³²While Aquinas did not consider Suárez's solution, Scotus certainly did (not, of course, under that description), since he invokes the same principle for the generation of all organisms whose sublunary efficient causes cause by means of seed, on the grounds that the form of seed is inferior to soul, and therefore incapable of generating a living material substance. See Scotus, *Lectura*, Book II, Distinction 18, Questions 1–2, ¶ 37 (Vatican, XIX.163); *QMet*, VII.12, ¶ 32–40 (Bonaventure, IV.204–6); *Reportatio*, II-A.18.1, ¶ 11–12 (Wadding, XI.354–55). Moreover, when Scotus argues for the existence of substantial forms of organs, he presents but then rejects an argument that uses exactly the same reasoning as the argument from contradiction, on the grounds that a “universal generator” could induce a new form at the moment the organ was removed from the body. See *QMet*, VII.20, ¶ 11–12 (Bonaventure, IV.382).

³³Aquinas, *In de generatione et corruptione*, I.10.6.

of its accidents were never accidents of Mole. Suárez argued instead that quantity and some qualities do not depend on *substance* for their existence but on *matter*. Wherever the matter goes, therefore, so go those accidents. Since Mole's matter survives Mole's death (albeit not under the description 'Mole's matter') and becomes the matter of a new substance, Mole's corpse, the accidents inhering in Mole's matter survive Mole's death, too.³⁴ This move allows Suárez to explain the similarity of the corpse's accidents to Mole's—they are numerically identical—at the cost of making quantified matter play the role of substance, without the name.

The intuitive implausibility of the claim that Mole's corpse is an entirely new substance with entirely new accidents, coupled with the difficulty of giving an efficient causal account of the generation of this new substance with its new accidents, pushes strongly in favor of the pluralist position, Scotus's hasty argument from "contradiction in being" notwithstanding.

3. SCOTUS AGAINST STANDARD PLURALISM

In his dispute with Aquinas, Scotus was concerned merely to show that living substances have *at least one* substantial form in addition to the soul. If this were all he was committed to, then it would be natural to think of the body as *one substance* informed by one substantial form of corporeity, where the form of corporeity is responsible not just for an organism's being a body, but also for its being a body with a certain structure, with the sorts of integral parts requisite for the life of an organism of some kind. Scotus's view is more complicated than this, however, since he thinks that an organism's integral parts are *distinct kinds of substances*, each with its own substantial form. This in itself does not entail that there is not a form of corporeity distinct from these several forms of organs, however, since it could be that the form of corporeity has some other role in composing an organism. Nor does it entail that the body is not one substance. For example, Scotus considers whether the role of the form of corporeity might be to *unify* the integral parts, making them part-substances of one substance, the body, which is then ready to be informed by the soul. For reasons stated in section 5, however, Scotus rejects this thought. These considerations indicate that Scotus simply has no need for a form of corporeity in addition to the substantial forms of organs. It neither endows the integral parts with their respective functions, nor does it unify them.

In this section I consider Scotus's primary argument for denying that the form of corporeity endows the integral parts with their respective functions, an argument that I call the "impossibility argument."

In *Quaestiones super libros Metaphysicorum Aristotelis* (= *QMet*), Book VII, Question 20, Scotus asks whether the organic parts of animals have distinct substantial forms that are of different kinds.³⁵ He argues that they do. In the course of arguing for

³⁴Suárez, *De generatione et corruptione*, Disputation I, Question 4, 490–92; see the parallel discussion in *Disputationes metaphysicae*, XV.10 (Berton, XXV.536–57). Suárez credits the view to Astudillo, *De generatione et corruptione*, Book I, Question 2, f. v–ix.

³⁵Scotus, *QMet*, VII.20 (Bonaventure, IV.381–94). Although the explicit topic of this question is whether the integral parts of animals have distinct substantial forms, it is clear that Scotus thinks that an affirmative answer to this question entails an affirmative answer to the question about whether the integral parts of animals are distinct substances. See for example *QMet*, VII.20, ¶ 38 (Bonaventure, IV.389–90); and *Lectura*, III.2.3, ¶ 117 (Vatican, XX.113).

his position, Scotus presents and then criticizes an argument for the opposing positions (1) that there is just one substantial form in an animal, and (2) that there are only two substantial forms in an animal. He identifies a principle shared by both views, and attacks this principle en route to denying both (1) and (2). His presentation of these positions is not pellucid, but it is intelligible. Here is the text:

Another opinion, [(1)] that the form of corporeity³⁶ precedes the soul (if there be another [substantial form]): it would be one for the whole, virtually containing in itself many perfections on account of which it would perfect diverse parts of matter, and would constitute diverse incomplete organs, namely as imperfect and quasi-remote principles of diverse operations. Thus [(2)] if the sensitive soul of the brute animal from its perfection includes the perfection of such a form of corporeity, and in addition to this its own [perfection], it will be able to be one really and many virtually. And according to diverse perfections virtually contained, both properties of it and of the form of corporeity (if it includes it) it will be able to perfect diverse parts of matter and perfectly constitute diverse organs.³⁷

Opinion (1) says that an animal has two substantial forms, one form of corporeity and one soul; it is a version of standard pluralism. Opinion (2) is the unitarian view that an animal has just one substantial form, a soul. According to (1), a form of corporeity “virtually contains” the perfections of the different organic parts. By ‘virtually contains’ Scotus means that while the form of corporeity itself does not have organic parts of different functions, it has the power, or in an archaic sense of the word the ‘virtue,’ to compose a substance that does have such parts. By informing matter, the form of corporeity makes a substance with *incomplete* organs, suitably disposed to be perfected by a soul. The soul then *completes* the organs, that is it makes them fully functioning organs in the life of an animal. According to (2), the soul does all the work that the form of corporeity is supposed to do in (1), plus its normal vivifying activity. The common assumption between these two views is this: one form virtually contains many perfections, and can give different perfections to different parts of matter. (Call this assumption “DP,” for Different Perfections.)

Scotus has two objections to DP. First, it cannot explain how a substantial form gives one perfection to *this* part of matter and another perfection to *that* part.³⁸ In other words, it cannot explain how the parts have the particular structure they have. Why, for instance, does a substantial form give head structure and neck structure to

³⁶What I translate here as ‘form of corporeity’ is actually ‘form of the mixed’ (*forma mixti*) and ‘form of the mixture’ (*forma mixtionis*). These latter two expressions are used frequently in *Ordinatio*, IV.11.1.2.1, where they are interchangeable with ‘form of corporeity’ (*forma corporeitatis*). Their interchangeability is evident throughout the whole question, but especially in ¶ 285–86 (Vatican, XII.267–68). Scotus does not use the expression ‘*forma corporeitatis*’ in *QMet*, VII.20.

³⁷Scotus, *QMet*, VII.20, ¶ 25 (Bonaventure, IV.385): *Opinio alia: Quod forma mixti praecedens animam, si esset alia, ipsa esset una totius, virtualiter in se continens perfectiones multas, secundum quas perficeret diversas partes materiae, et constitueret diversa organa incompleta, scilicet principia imperfecta et quasi remota operationum diversarum. Quare si sensitiva animalis bruti ex perfectione sui includat perfectionem talis formae mixti, et praeter hoc propriam, poterit esse una realiter et multiplex virtualiter. Et secundum diversas perfectiones virtualiter contentas, tam proprias sibi quam formae mixti—si eam includat—poterit diversas partes materiae perficere et diversa organa perfecte constituere.*

³⁸Scotus, *QMet*, VII.20, ¶ 31 (Bonaventure, IV.387).

adjacent parts of matter, rather than head structure and ankle structure? Second, DP cannot explain why a substantial form does not give all of the perfections that it can give to every part of matter.³⁹ Scotus thinks that the second objection is the more worrisome of the two, because he takes it to be impossible for the very same part of matter to have repugnant perfections: for example, a hand and an eye are both partially composed of matter, but plausibly the very same matter cannot have both eye structure and hand structure, since a hand needs to be stiff for grabbing and an eye needs to be soft for receiving sensory images.

In light of this objection, Scotus offers a refinement of DP that is intended to explain how one form, virtually containing many perfections, can distribute its perfections to different parts of matter and can arrange the parts in the right way. Scotus suggests on his opponent's behalf that a substantial form has both a "virtual totality" and a "quantitative totality." As used here, virtual totality is the sum of all the perfections that a substantial form gives to matter, and quantitative totality is the structure of the distribution of a form's perfections. For example, in the unitarian view, a sensitive soul makes a substance that has all the parts needed for sensing, for taking in nutrients and expelling waste, and for procreating, and additionally ensures that these parts are distributed and arranged in the appropriate way.⁴⁰

Scotus finds two reasonable ways to interpret this modified version of DP, and objects to both. First, it could be that in introducing the notion of quantitative totality the defender of DP is claiming that a substantial form has really distinct parts of different kinds, one part responsible for giving one perfection to one part of matter, and another part responsible for giving another perfection to another part of matter. But this, says Scotus, simply amounts to the view that Scotus himself eventually defends, which is that the form of corporeity is just reducible to really distinct substantial forms that are parts of a unity of order: "What is the difference between this subtle opinion which seems to follow reason," he asks rhetorically, "and the first [Scotus's own opinion] which seems gross but consonant with sense?"⁴¹ Second, if the defender of DP is not claiming that a substantial form has really distinct parts of different kinds, then a contradiction follows.

Here is how the contradiction is supposed to arise: Scotus holds that if two perfections are impossible in the very same matter, then one and the same form cannot virtually contain those two perfections. The defender of DP agrees with Scotus that some pairs of perfections are impossible in the same matter, but insists that the same form *can* virtually contain such a pair. Scotus's task, then, is to show why the consequent is supposed to follow from the antecedent. Scotus asserts that two perfections are impossible in some third thing if and only if they are repugnant to each other. He stipulates as a second premise that two or more things are *in* a third thing (*insunt tertio*) in exactly two ways: either when they are virtually contained by a form, or when they inform the same part of matter.

³⁹Scotus, *QMet*, VII.20, ¶ 32 (Bonaventure, IV.388).

⁴⁰Scotus, *QMet*, VII.20, ¶ 33 (Bonaventure, IV.388). Scotus says in this passage that an intellectual soul has only virtual totality, and therefore gives all of its perfections to every part of the matter that it informs.

⁴¹Scotus, *QMet*, VII.20, ¶ 36–37 (Bonaventure, IV.389): *Item, quae est differentia huius opinionis subtilis, quae videtur sequi rationem, et primae, quae videtur grossa et est sensui consona?*

(Logically speaking, there could be other ways in which two or more things could be in a third, but Scotus discusses none of them here.) From these premises it follows that the reason some pair of perfections are impossible in the same matter—that they are repugnant to each other—is equally the reason why those perfections cannot be virtually contained in a single form. But the defender of DP does hold that some pairs of perfections are impossible in matter, and therefore is logically committed to the view that one form cannot contain perfections that are impossible in matter.⁴²

The argument's success depends on the truth of Scotus's implied claim that there is at least one sense of 'being in' that applies both to the way perfections are in matter and to the way perfections are in a form, such that if two perfections cannot be in matter then they cannot be in form (and vice versa). An argument for this claim would have helped his cause; in its absence, we are left to speculate. Unfortunately for Scotus there seems to be an important and relevant disanalogy between the way perfections are in form and the way forms are in matter. If matter is informed by some substantial form that virtually contains several perfections, say *F* and *G*, the result is a substance that is *F* and *G*. But the form containing those perfections is not itself *F* and *G*, and in general forms are not characterized by the perfections that they virtually contain. Consider two repugnant perfections: being square and being circular. Obviously these cannot inhere in the very same matter, since the resulting object would simultaneously be circular and square. But if these are virtually contained in one form, it does not follow that that form is square and circular; it only follows that if that form informs matter then it makes something that is square and circular. But it is exactly here that the objector's notion of quantitative totality is supposed to do metaphysical work. The form, containing the perfections of being square and being circular, is also endowed with an abstract structure for how these perfections are arranged in matter, or so the objector claims. The form, let us say, makes one part of matter square and another part circular. Thus, on the supposition that forms have quantitative totality, the defender of DP *can* explain why a form does not give all of its perfections to every part of matter, contrary to Scotus's second objection. Quantitative totality also furnishes the DP-defender with a way of explaining how a form gives structure to the parts of matter. Scotus's impossibility argument appears, therefore, to fail.

Fortunately for Scotus, however, there is an additional reason in favor of his rejection of DP. It is the thought that, if repugnant perfections can be virtually

⁴²Scotus, *QMet*, VII.20, ¶ 35 (Bonaventure, IV.388–89): *Contra ista: si perfectiones aliquae virtualiter contentae sunt impossibiles in materia, igitur et in forma continente. Probatio consequentiae: numquam est impossibilitas aliquorum ut insunt tertio, nisi quia inter se sunt impossibilia. Unde si album et nigrum non essent inter se repugnantia quin secundum proprias rationes simul essent in aliqua essentia continente, ut in rubore, secundum proprias rationes possent idem perficere.* ("If the perfections of something virtually contained are impossible in matter, therefore also in the containing form. Proof of the consequence: there is never impossibility of things as they belong to a third, unless because they are impossible among themselves. Hence, if white and black were not repugnant to each other so that with their own distinctive natures they might be at the same time in some essence that contains them, for example, redness, they would with their own distinctive natures be able to perfect the same thing." Thanks go to Martin Tweedale for suggesting an improvement to the translation of the last sentence of this quotation.)

contained in one (noncomplex) form, then *every* perfection can be virtually contained in one (noncomplex) form. We might as well hold that the whole world is informed by one substantial form. But this spells doom for a hylomorphic analysis of change, according to which form and matter (along with privation) are invoked as those principles of nature that explain qualitative and substantial change.⁴³ For example, Socrates's change from white to black is partially explained as the loss of a form of whiteness and the acquisition of a form of blackness. Thus, according to the view that there is simply one form of the world, or more modestly that whiteness and blackness can be virtually contained by one and the same form, we lose whatever original motivation we had to posit forms. Better to hold, then, as Scotus apparently does, that we distinguish between forms at least partially on the basis of opposed perfections. When two perfections cannot be actualized in the very same matter, we attribute them to two different forms.

Fortunately for me, my aim here is neither to defend nor refute Scotus, but merely to point out that his impossibility argument signals his rejection of the idea that one form can account for the varied and incompatible perfections of an animal, whether this one form is a soul or a form of corporeity.⁴⁴

4. AN INCONSISTENT POSITION ABOUT THE FORM OF CORPOREITY?

Despite his apparent rejection of the form of corporeity in favor of distinct substantial forms of organic parts in *QMet* VII.20, Scotus sometimes uses the expression *form of corporeity* and its synonyms to express his own views, so it is important to say something about how this apparent rejection is consistent with passages in which he does not reject the form of corporeity. In my view, Scotus's use of 'form of corporeity' and similar expressions is shorthand for all of the substantial forms that compose the body, so I do not think that Scotus is inconsistent. Richard Cross

⁴³Aristotle, *Physics*, Book I, Chapters 6–8 (Barnes, I.323–28).

⁴⁴Scotus's rejection of the form of corporeity in favor of many forms of integral parts provides him with a nice response to one of Aquinas's objections to pluralism—an objection that has some force against standard pluralism, and that Suárez later directed against Scotus himself. Aquinas and Suárez argued that pluralism entails that there could be a body that was not of any determinate kind, that was simply corporeal. From a pre-Cartesian, Aristotelian perspective, a body that is not of any kind is metaphysically unwelcome, not just because it is difficult or impossible to conceive, but more importantly because it would tread a middle ground where a middle is excluded. On the Porphyrian Tree, animate and inanimate exhaustively divide the genus "body," so every body must be one or the other; moreover sensitive and nonsensitive exhaustively divide the genus "animate body," so every animate body must be one or the other. Against standard pluralism this seems like a good objection. Against Scotistic pluralism, however, this criticism misses the mark: according to Scotus there is no such thing as "body" as such. As deep as one wishes to analyze a substance's compositional structure, one never arrives at a part that is simply a body. There is always a body of a certain kind: the heterogeneous parts (such as a heart, liver, or hand), composed of a substantial form together with homogeneous parts (such as flesh and bones), and the homogenous parts, composed of prime matter and substantial form. For Aquinas's and Suárez's objection, see Aquinas, *Sententia libri Metaphysicae*, VII.12, ¶ 9; Suárez, *De generatione et corruptione* I.2, 465: *Nam si forma constituens genus et speciem sunt distinctae, posset separari inferior, servata superiori, ut posset separari anima, servata forma corporeitatis, et manere hoc corpus sub nulla specie corporis.* ("For if the forms constituting genus and species are distinct, the inferior can be separated, preserving the superior, as the soul can be separated, preserving the form of corporeity, and can remain this body under no species of body.")

thinks he is, claiming that whereas *QMet* VII.20 holds that the forms of organs are *really distinct parts* of the form of corporeity, according to *Ordinatio*, Book IV, Distinction 11, Question 3 the forms of organs are *in potency* to the form of corporeity.⁴⁵ By my reading, while *Ordinatio*, IV.11.3 is less explicit than *QMet*, VII.20 about Scotus's commitment to a plurality of forms of integral parts, and his rejection of a form of corporeity distinct from these, it is nevertheless consistent with it. To show this, I consider three passages from *Ordinatio* IV.11.3, including the passage that Cross cites as proof of the inconsistency between this text and *QMet* VII.20.

The first passage is *Ordinatio* IV.11.3, ¶ 56. According to Cross's reading, Scotus claims that the presence of the organs is not necessary for the inherence of the form of corporeity.⁴⁶ If correct, this would show that the form of corporeity is really distinct from the forms of organic parts, since the former could exist without the latter. I do not think that this is the correct reading, however. In context, Scotus is discussing some general features of what it is for a body to be properly disposed for receiving the intellectual soul. A body needs to be disposed in a certain way if it is to be informed by the soul, but the particular grades of qualities necessary for the soul to inform the body are not necessary for the form of corporeity to inform matter. The body could have some other grades of qualities, suitable for it to go on existing, even if these make the body unsuitable for being informed by the intellectual soul. Scotus writes,

For the animation by the intellectual soul there is needed a heart and liver of determinate heat, a brain of determinate frigidity, and so on for individual organic parts. But such a disposition ceasing, there can still remain some species or quality which stays with the form of corporeity, although not that which is required for the existence and operation of the intellectual soul in matter.⁴⁷

Scotus does not say here that the organs can cease to exist while the form of corporeity remains united with matter. He says instead that the grades of the qualities of the organic parts can cease to be suitable for the intellectual soul even if they are suitable for the body. Presumably this is how Scotus would describe the death of an organism where the body remains intact but is no longer alive.

In the second passage, Scotus argues against what he takes to be Henry of Ghent's view that one potency in matter entails that only one substantial form can actualize that potency. Scotus agrees with Henry that the natural generation of a substance is *completed* by exactly one substantial form, but insists that this final generation may be preceded by several generations of parts, each of which has its own substantial form. Then he gives an example:

For example: if organic parts are posited as differing according to substantial forms, then the generation of one precedes, not only by nature but also temporally, both the generation of other parts and that generation which is simply the generation of

⁴⁵Cross, *Physics of Duns Scotus*, 69.

⁴⁶Cross, *Physics of Duns Scotus*, 69–70.

⁴⁷Scotus, *Ordinatio*, IV.11.1.2.1, ¶ 284 (Vatican, XII.267): *Istud patet exemplo, quia ad animationem ab intellectiva requiruntur cor et hepar determinate calida, cerebrum determinate frigidum, et sic de singulis partibus organicis; tali autem dispositione cessante, potest adhuc manere aliquas species vel qualitas, quae stat cum forma mixtionis, licet non illa quae requiritur ad esse et operationem intellectivae in materia.*

the whole, namely [that generation] by which the form of the whole is induced, the forms of all the parts already presupposed.⁴⁸

Here the view is that some organic parts are generated before others and before the generation of the whole substance. Scotus's use of 'form of the whole' here could be read either as the final perfecting substantial form, or as the whole substance itself, which is produced by the concurrent causality of the essential parts. In either reading, however, Scotus has in mind that change by which the whole complete substance is brought about, and not that by which a form of corporeity is brought about.

In the third and final paragraph, Scotus, replying to Aquinas's worry that a plurality of substantial forms compromises the unity of a substance, writes,

I concede that the formal existence of the whole composite is principally through one form, and that form is that by which the whole composite is this being. But that form is the last, coming to *all the preceding*. And in this way the whole composite is divided into two essential parts in proper act, namely the last form by which it is that which it is, and the proper potency of that act which includes prime matter with *all the preceding forms*. . . . An example of this is in a composite of integral parts; for, the more perfect the animate thing, the more it requires a plurality of organs, and it is probable that [they are] distinct kinds through substantial forms.⁴⁹

Clearly this text is at least consistent with Cross's view, since it could be that "all the preceding forms" refers to all of the forms of organic parts as well as a separate form of corporeity. It is suggestive, however, that Scotus's example of his view makes no reference to a separate form of corporeity but only to integral parts, which "probably" have distinct substantial forms of distinct kinds. The "last form" clearly refers to the final perfecting substantial form or soul, and not a form of corporeity.

Despite these textual considerations, I do not think that *Ordinatio* IV.11.1.3, taken on its own, presents a determinate view about the relation between the form of corporeity and the forms of organic parts. Scotus's *explicit* conclusion is that in a living substance such as Christ, there is in addition to matter and soul *at least one* form of corporeity.⁵⁰ And the conclusion from the argument from contradiction is simply, "It is necessary to posit that form by which the body is a body, distinct from that by which it is animate."⁵¹ Both of these texts are consistent with Cross's view, and the use of the singular ("that form") in the second reference could be taken to lean in favor of his view. Equally plausible, however, is that the unity of

⁴⁸Scotus, *Ordinatio*, IV.11.1.2.1, ¶ 238 (Vatican, XII.250): *Exemplum huius est si ponantur partes organicae differre secundum formas substantiales: tunc enim generatio unius praecedat non solum natura sed etiam tempore generationem alterius partis, et etiam generationem illam quae est simpliciter generatio totius, qua scilicet inducitur forma totalis praesuppositis iam formis omnium partium.*

⁴⁹Scotus, *Ordinatio*, IV.11.1.2.1, ¶ 252 (Vatican, XII.255–56): *Concedo quod totale 'esse' totius compositi est principaliter per formam unam, et illa est forma, qua totum compositum est 'hoc ens'; illa autem est ultima, adveniens omnibus praecedentibus; et hoc modo totum compositum dividitur in duas partes essentielles: in actum proprium, scilicet in ultimam formam, qua est illud quod est, et in propriam potentiam illius actus, quae includit materiam primam cum omnibus formis praecedentibus. . . . Exemplum huius est in composito ex partibus integralibus: quanto enim animatum est perfectius tanto requirit plura organa (et probabile est quod distincta specie per formas substantiales); my emphasis.*

⁵⁰Scotus, *Ordinatio*, IV.11.1.2.1, ¶ 285 (Vatican, XII.267–68).

⁵¹Scotus, *Ordinatio*, IV.11.1.2.1, ¶ 280 (Vatican, XII.265).

the form of corporeity—the unity by which it is *one*—is just the special sort of unity that the substantial forms of organic parts have, and this is the natural way to read the text in light of *QMet* VII.20. As I read the texts, what is merely adumbrated in *Ordinatio* IV.11.3, is crystallized in *QMet* VII.20.

5. THE SPECIAL POTENCY QUESTION

Having divided up the bodies of animals into many different substances, Scotus tries to find a way to maintain that one animal is still one substance. Scotus thinks that some substances are part-substances of Mole just in case they are informed by Mole's sensitive soul, and in general thinks that some substances become part-substances of another substance when there is some substantial form informing those substances. Substantial form is therefore Scotus's answer to (a suitably paraphrased version of) Van Inwagen's Special Composition Question: *Under what conditions do some substances compose a substance?*⁵² But Scotus does not think that a substantial form can inform just any assortment of substances; he thinks instead that there are at least two restrictions on the composition of substances. First, if some substances $p_1 \dots p_n$ can be informed by a substantial form of a kind K , they themselves are of the appropriate kinds. A Mole-soul cannot inform my briefcase or the Eiffel Tower, for example, since these cannot support the activities of a mole. Second, $p_1 \dots p_n$ must be *unified* in some way. Suppose we have two mole fetuses, one right here and another over there; the bottom half of one and the top half of the other cannot be informed by one and the same Mole-soul, since they do not have the right sort of unity. Scotus therefore asks a second question about composition, which presupposes his answer to the Special Composition Question, and which we might call the Special Potency Question: *Under what conditions can some substances be informed by a unifying substantial form?*

Scotus's answer is that some substances can be informed by a substantial form just in case they are of the appropriate kinds and are unified in what he calls a "unity of order." "Being of the appropriate kinds," in this context, means being the sorts of things that a complete substance requires in order to perform its specific functions: Mole, for example, needs certain organs for his sensitive and vegetative functions. 'Unity of order' (*unitas ordinis*) is a technical term. In the following section I will have much more to say about this kind of unity, but for now it is worth noting that Scotus thinks that if two or more things are so united then they have *more* unity than the parts of an aggregate (such as a pile of bricks), but *less* unity than the parts of a unity of inherence (the unity that holds between a subject and its accident).⁵³ In this section I motivate Scotus's answer to the Special Potency Question. I do this, first, by analyzing an argument—what I call the "unity argument"—that Scotus presents on his opponent's behalf, which aims to show that an animal cannot be a substantial unity, on the supposition that its parts are distinct substances; second, I present Scotus's response to the argument.

An assumed premise of the unity argument is that an animal is *more unified* than a mere aggregate, such that any account of the parts of animals that does

⁵²Van Inwagen, *Material Beings*, 21.

⁵³For Scotus's list of kinds of unity, see *Ordinatio*, I.2.2.1–4, ¶ 403, (Vatican, II.356–57).

not preserve this difference in degree of unity is *ipso facto* a bad account. This is intended to be uncontroversial: there is some intuitive appeal to the idea that, say, Mole's heart, lungs, bones, liver, and so on compose something more unified than the assortment of bricks in a pile of bricks, or an assortment of organs in an organ bank, even if it is hard to pin down exactly what this greater unity is supposed to amount to. Scotus himself accepts the premise. The first part of the argument reads as follows:

That opinion [of Scotus's, viz., that the organic parts of animals have distinct substantial forms of different kinds], if it posits some unity in the animal beyond aggregation (the way in which a heap of stones is one), it is necessary that one posit one of three modes: either [(a)] that its unity is from a final form, namely the sensitive soul, which is simply one kind in the whole, although extended *per accidens* through the extension of the whole; or, [(b)] that before that there is posited one form of corporeity, which is a disposition for the sensitive soul; or, [(c)] the third mode, that there is not a form that is of one kind, but only forms of many kinds, from which one form is integrated, by which there is a unity of composite.⁵⁴

Mode (a) expresses the view that various organic parts are unified when they are informed by one soul. Mode (b) says that there is an intermediary form—the form of corporeity—between the forms of organic parts and the soul, such that the form of corporeity unifies the organic parts and makes them capable of receiving the soul. Mode (c) holds that the many different kinds of *forms* of organic parts are “integrated” such that they make up a single form, which unites with matter to compose one substance. Mode (c) does not collapse into a version of (a) or (b) because in (c) the *forms* of integral parts are unified, not the integral parts themselves. The opponent continues the unity argument by showing that (a), (b), and (c) do not adequately explain the unity of the organic parts.

Against (c) the opponent invokes the closing lines of *Metaphysics* VII, in which Aristotle argues for something in addition to the letters A and B that explains their jointly composing the syllable, AB.⁵⁵ Here Aristotle calls this additional something ‘substance’ (οὐσία), but the opponent refers to it as that which is ‘act’ with respect to the parts, suggesting that he took Aristotle’s use of ‘substance’ (in this passage) as synonymous with ‘substantial form.’ Taking Aristotle’s cue, the objector reasons by analogy that the forms of organic parts would become one form only if there could be some higher-order form that unifies them, just as the letters become one syllable only if there is a form that unifies them. But, the objector continues, a form cannot inform forms. Therefore distinct forms cannot compose one form (contrary to [c]). The second premise holds given the general scholastic thesis that a form is act and not in potency to receive the act of an additional form. Therefore (c) cannot explain how organic parts compose a substantial unity.

⁵⁴Scotus, *QMet*, VII.20, ¶ 19 (Bonaventure, IV.383–84): *Ista opinio si ponat aliquam unitatem in animali praeter aggregationem—quo modo unus est acervus lapidum—oportet quod uno trium modorum ponat—Vel quod eius unitas sit ab ultima forma, scilicet anima sensitiva, quae sit simpliciter una specie in toto, licet extensa per accidens ad extensionem totius—Vel quod ante istam ponatur una forma mixti, quae sit dispositio ad sensitivam—Vel tertio modo, quod nulla est ibi una forma specie, sed tantum multae specie, ex quibus integratur una forma a qua est unitas compositi.* (I have profited from Martin Tweedale’s suggested translation of the part of the quotation following ‘tertio modo.’)

⁵⁵Aristotle, *Metaphysics*, VII.17.1041b11–33 (Barnes, II.1644).

One natural modification of (c) is that an additional substantial form unifies the integral parts themselves, and not their forms. (a) and (b) are two such modifications of (c): each posits a substantial form that unifies the organic parts, making them part-substances of an animal. But according to the opponent, both (a) and (b) face difficulties as well:

Both are disproved though this argument: For a unity of perfection there is presupposed one proper perfectible, such that the proper unity of the perfectible is presupposed by the unity of perfection and is not from it. How will you give such a unity in that which is perfectible by the sensitive [soul], according to the first way, or in that which is perfectible by the form of the mixture, according to the second? It does not seem possible.⁵⁶

The opponent reasons that something is in potency to receive a substantial form only if it is *already unified* in some way. 'Unity of perfection' in general refers to the sort of unity that a form, whether substantial or accidental, makes with its subject. In the text it refers specifically to the unity that a *substantial* form and its subject have. The 'perfectible' in general refers to that which is in potency to a form, and in the text it refers specifically to that which is in potency to a substantial form. 'Proper unity' is used here in a vague way. At minimum it refers to whatever sort of unity several substances must have if a substantial form can perfect them. From the argument against (c) we can infer that this proper unity is something less than substantial unity, because there the opponent claims that substantial unity only comes about through substantial form. We can also assume that proper unity is greater than aggregative unity, since aggregates are indifferent to the precise arrangement of their parts, and also to the kinds to which their parts belong, both of which surely must be a condition on the proper unity of a perfectible. The arguments against (a) and (b) close the unity argument.

Since Scotus accepts the opponent's view that substances must be unified in some way if they are in potency to a substantial form, the unity argument leaves him with the formidable challenge of providing some sort of unity that is less than substantial but more than aggregative. Scotus's response to the challenge is difficult and (I think) ultimately impossible to understand without recourse to texts other than *QMet*, but here it is:

To [the unity argument] I respond: material parts, which are called elements at the end of [*Metaphysics*] VII [1041b11–16], do not have as much unity before they receive form as they have from form; just as A and B in themselves [do not have as much unity] as they have from the form of the syllable. Therefore a unity of order among the parts of matter in regard to the unbounded form suffices in some way, namely that the whole matter from those [parts] may have an order to such a form as to an adequate act, in regard to which no part of matter would be adequate potency.⁵⁷

⁵⁶Scotus, *QMet*, VII.20, ¶ 21 (Bonaventure, IV.384): *Uterque improbat per hanc rationem: unius perfectionis est unum perfectibile proprium praesuppositum, ita quod illa propria unitas unius perfectibilis praesupponit unitati perfectionis, nec est ab ea. Quam talem unitatem dabis in perfectibili sensitivae, secundum primam viam; vel in perfectibili formae mixtionis, secundum secundam? Non videtur possibile.*

⁵⁷Scotus, *QMet*, VII.20, ¶ 48 (Bonaventure, IV.392–93): *Partes materiales, quae vocantur elementa in fine VII, non habent tantam unitatem antequam recipiant formam quantum habent a forma; sicut a et b in se, quantum habent a forma syllabae. Sufficit igitur respectu formae illimitatae aliquo modo unitas ordinis in partibus materiae, scilicet quod tota materia ex illis ordinem habeat ad talem formam ut ad actum adaequatum, respectu cuius nulla pars materiae esset potentia adaequata.*

Scotus calls this unity a “unity of order,” which is supposed to be immune to the argument against (a) and (b), inasmuch as the organic parts are more unified than the parts of an aggregate, and simultaneously immune to the argument against (c), since it is the integral parts and not their forms that have a unity of order. It is clear from the context that by ‘material parts’ Scotus does not have prime matter in mind, and that by ‘elements’ he does not have earth, water, air, and fire in mind. Instead, he means those organic parts that when properly united are in potency to the soul and in this sense are material, just as A and B are the matter of the syllable AB. The “unbounded form” is the soul or perfecting substantial form before its reception in the body. Several substances together are “perfectible” by a substantial form, then, if there is some unity of order among them.⁵⁸

6. ESSENTIAL ORDERS

So what is this unity of order? The expression ‘*unitas ordinis*’ and its inflected variants do not occur often in Scotus’s corpus. In a brief taxonomy of kinds of unity in *Ordinatio* Book I, Scotus says simply that a unity of order is a greater unity than an aggregate and a lesser unity than a relation of informing.⁵⁹ But this is not very helpful to us, since we have already gathered that part-substances must be more unified than an aggregate and less unified than a unity of perfection. Intuitively, the relevant sort of unity that some parts must have in order to be potentially alive is a kind of cohesion and/or organization. We will not get a mole simply by heap- ing together some mole parts: we need them to be properly related or ordered to one another. I suggest that we can get a richer sense of this proper order by attending to Scotus’s use of ‘unity of order’ in his late treatise *De Primo Principio*.⁶⁰ When he discusses a unity of order in this work—and he does so far more here than in other works—he has in mind the unity that obtains among the *relata* of the

⁵⁸A slight twist on my translation of Scotus, *QMet*, VII.20, ¶ 48 yields a very different position, so it is worth defending my take in a little more detail. In my translation (and in Etzkorn and Wolter’s) the paragraph employs two notions of “order”: (1) the “unity of order” that obtains among the material parts, and *because they are so ordered*, and (2) the order that that material parts have *as to their adequate act*. But the Latin could permit a reading according to which only one notion of order is employed: the unity of order of all the material parts (taken together) *to* the substantial form. An anonymous referee suggests that this is the correct way to read the passage. From context, however, it is clear that this alternate reading will not do. The unity argument revealed a weakness in Scotus’s position that organic parts have their own substantial forms, namely, that these part-substances must be sufficiently unified before they can together be informed by a substantial form. For his view to stand up, Scotus must offer an adequate account of the unity of these part-substances. Paragraph 48 presents Scotus’s solution to the problem: the part-substances are more than just an aggregate and less than a substance: they are instead a unity of order, and because of this order they can together be informed by a substantial form. In the reading espoused by my anonymous referee, Scotus simply asserts what his opponent denies, namely that several substances can be informed by a substantial form. In my reading, Scotus is offering the conditions under which several substances can be informed by a substantial form, conditions which are developed precisely to address and dispel his opponent’s objection. I therefore see no reason to adopt the alternate reading of the paragraph. For Etzkorn and Wolter’s translation see Scotus, *Questions on the Metaphysics of Aristotle*, 2:339.

⁵⁹*Ordinatio*, I.2.2.1–4, ¶ 403 (Vatican, II.356–57).

⁶⁰The work is generally assumed to be very late. Likely it is a compilation, done with the help of a secretary, of writings taken from the first book of *Ordinatio*, itself a relatively late work. For discussion of the genesis of *De Primo Principio* (DPP), see Wolter, “Introduction,” ix–xiii, and references therein.

relations *essentially prior* and *essentially posterior*. Thus x and y have a unity of order if and only if one is essentially prior to the other. For example, Scotus says that the world is a unity of order because everything in the world is essentially ordered in terms of both perfection and dependence.⁶¹ Also, the four causes—final, efficient, material, formal—are essentially ordered in the production of their joint effect, and therefore compose a unity of order.⁶² Plausibly, then, when Scotus says that part-substances are sufficiently unified to receive substantial form if they compose a unity of order, he means that these parts are in some sense essentially ordered to one another.

But Scotus identifies several different kinds of essential orders, and it is not obvious just how part-substances are supposed to be essentially ordered to one another, at least in a way that is relevant to their joint functioning as the material cause of a material substance. Scotus's text is unfortunately silent about precisely what order he had in mind. Nevertheless, through some careful reading of *De Primo Principio* it is possible to fill out Scotus's account of the unity of part-substances in a way that is faithful to Scotus's deep metaphysical commitments, and presents Scotus in *QMet* VII.20, ¶ 48 simply as alluding to a well-developed metaphysical view, rather than reaching for an ad hoc solution. To this end, in this section I elaborate the main features of essential orders, and in the following section I apply the framework of essential orders to the unity of order of organic parts, raising and the responding to an objection to this application.

Scotus divides essential orders into two sorts: an order of eminence and an order of dependence.⁶³ Only the second is relevant here. In an essential order of dependence, x 's *being prior to y* is a matter of y 's *depending on x*. Scotus distinguishes six types of orders of essential dependence. Each of the four Aristotelian causes is essentially prior to its correlative: anything that is ordered to an end is essentially dependent on a final cause; any effect is essentially dependent on an efficient cause; anything made of matter is essentially dependent on a material cause; and any formed thing is essentially dependent on a formal cause.⁶⁴ The remaining two essential orders of dependence—what we might call “nonevident” essential orders⁶⁵—hold among effects of a common cause. In the following I discuss briefly, first, some general features of essential orders, next, the causal essential orders, and finally the nonevident essential orders.

In the most general sense, x and y are essentially ordered if and only if either x is essentially prior to y and y is essentially posterior to x , or y is essentially prior to x and x is essentially posterior to y .⁶⁶ Relations of essential priority and posteriority are transitive (if x is essentially prior to y and y is essentially prior to z then x is essentially prior to z), but noncircular (if x is essentially prior to y then y is not essentially prior to x) and irreflexive (x is not essentially prior or posterior

⁶¹Scotus, *DPP*, Chapter III, ¶ 49, pages 64–66.

⁶²Scotus, *DPP*, II, ¶ 30, 25–27.

⁶³Scotus, *DPP*, I, ¶ 6, 5.

⁶⁴Scotus, *DPP*, I, ¶ 15, 9.

⁶⁵The label was suggested to me by Marilyn McCord Adams, playing on Scotus's own description of these orders as *nec in se patet*.

⁶⁶Scotus, *DPP*, I, ¶ 5, 3.

to itself).⁶⁷ It can and frequently does turn out that some x is essentially prior to some y in one kind of essential order, but essentially posterior to y in a different kind of essential order. For example, Scotus thinks that matter is essentially prior to form in the essential order of dependence, but essentially posterior to form in the order of eminence.⁶⁸

Not every causal relation is an essential order of dependence. In the orders of final and efficient causality, Scotus distinguishes *essentially* from *accidentally* ordered causal series.⁶⁹ In an accidentally ordered causal series, an effect does not depend on its cause in its causing. In Scotus's example, a son can procreate whether or not his parents are alive.⁷⁰ In an essentially ordered causal series an effect does depend on its cause in its causing. For example, the stick moves the ball partially because it is moved by the hand. As an example from the order of final causality, if Mole and Rat are paddling the boat up the river in order to find a quiet spot for a picnic, then their paddling is essentially ordered to finding a quiet spot for a picnic—for the sake of finding a spot for a picnic they are paddling, and they would not be paddling were it not for finding a spot for a picnic. I am not sure how to describe an accidentally ordered final causal series, however, and Scotus does not offer an example of one.⁷¹

Essential orders are also distinguished from accidental orders in that all the causes of an essentially ordered causal series are simultaneous in their causing.⁷² To see why Scotus thinks this, imagine three terms in an essentially ordered causal series: c_1 , c_2 , and c_3 , such that c_1 causes c_2 and c_2 causes c_3 . If c_2 and c_3 were not simultaneous, then c_2 would be either before or after its effect. Obviously it would not be after its effect. If it were before its effect, then c_1 would be causing c_2 to cause c_3 for some period of time during which c_2 was not causing c_3 —a contradiction.

At least some essentially ordered items are not just things but *things insofar as they are causing*.⁷³ For example, an end is a (final) cause not because it causes the efficient cause, but because it causes *the causality* of the efficient cause, insofar as the end is desired and is therefore that for the sake of which the efficient cause (efficiently) causes. Similarly, the efficient cause produces a material substance by causing *the causality* of the matter and the form, the product of which is the material substance itself.

In nonevident essential orders, essential dependence relations obtain among two or more effects of some common cause. According to Scotus,

⁶⁷Scotus, *DPP*, II, ¶ 2–7, 15.

⁶⁸Scotus, *DPP*, II, ¶ 32, 27.

⁶⁹Scotus, *DPP*, III, ¶ 11, 47.

⁷⁰Scotus, *DPP*, III, ¶ 14, 49.

⁷¹The problem is that I cannot conceive how the mere *existence* of x could be for the sake of y (that is, how y could be the final cause of x and not some *activity* of x). Final causality appears to me to be inextricable from action in a way that efficient causality is not. I do not have any conceptual hangups, for example, with the idea that Mole's parents are simply the efficient causes of Mole. Even in the theological context in which Scotus was at home, according to which everything exists for God's sake, is not what is really meant that everything (ultimately) *acts* for God's sake? But the difficulties raised here will have to wait their turn.

⁷²Scotus, *DPP*, III, ¶ 14, 49.

⁷³Scotus, *DPP*, II, ¶ 33, 27–29.

If one and the same cause [z] produces a dual effect [x and y], one of which [x] is such that by its nature it could be caused before the other [y] and therefore more immediately, whereas the second [y] can be caused only if the first [x] is already caused, then I say that the second effect is posterior in the order of essential dependence, whereas the more immediate effect of the same cause is prior.⁷⁴

Notice that Scotus here leaves it open as to whether x is itself a *cause* of y ; he says only that y essentially depends on x in such a way that z must cause x before it can cause y . Among the nonevident essential orders of dependence, Scotus distinguishes *proximate* from *remote* nonevident essential orders of dependence (PNEO and RNEO): x and y are in a PNEO if and only if x and y are effects that are essentially ordered to their cause, z , and z could not cause y unless it first caused x ; r and t are in an RNEO if and only if r and s are effects that are essentially ordered to their cause, q , and s could not cause its effect, t , unless q first caused r .⁷⁵

By distinguishing two types of nonevident essential dependence (PNEO and RNEO), Scotus does not provide much by way of guidance in identifying what the *relata* of such orders might be. He is not completely silent on this issue, however. If x essentially depends on y (for its existence, for its causing) but x is not a final, efficient, formal, or material cause of y , then x and y stand in either a PNEO or an RNEO. Using Scotus's own example, suppose that a qualitative form (such as a color form) essentially depends on a form of quantity, in the sense that something must be extended if it is to be colored. They are effects of a common cause, in the sense that an efficient cause causes something that is both quantified and colored. Scotus says that while quantity is an effect more immediate than quality, "it is not the cause of quality, as is evident if we go through the causes."⁷⁶ We are still inclined to say that a thing *must* be extended if it is to be colored, however, so we say that color noncausally (nonevidently) depends on quantity in a PNEO.⁷⁷

7. ESSENTIALLY ORDERED UNITY

Applying this procedure to the question about the sort of unity of order that organic parts are supposed to have, it is clear that they could not be related causally to one another as formal or material causes. One substance—a heart, for example—can be a (partial) material cause of Mole in the sense that the heart, when suitably unified with other organic parts, can receive a substantial form and become a part of Mole. But a heart *cannot* be a material cause of a liver or of any other part-substance, since the heart neither becomes a part of, nor becomes, a liver. Nor can a substance be the formal cause of another substance, since it is of

⁷⁴Scotus, *DPP*, I, ¶ 11, 7.

⁷⁵Scotus, *DPP*, I, ¶ 13, 7–9; in these formulations of PNEO and RNEO I am assuming noncircularity and irreflexivity, since these hold for all essential orders.

⁷⁶Scotus, *DPP*, II, ¶ 36, 29.

⁷⁷Scotus's denial in *DPP*, II, ¶ 36 that quantity is a cause of quality, or even a material cause of quantity, seems inconsistent with aspects of his eucharistic metaphysics. For example, in *Ordinatio*, IV.12.1.2 (Vatican, XII.330–48), Scotus argues that in transubstantiation, where the substance of bread and wine are converted to the body and blood of Christ but the accidents of bread and wine remain numerically and specifically the same and do not become accidents of the body and blood of Christ, *quantity is the subject of quality*. Within Scotus's metaphysics and in general scholastic Aristotelian metaphysics, it is not clear how x could be the subject of y without being a material cause of y .

the wrong ontological kind—only forms are formal causes. But there are reasons to think that part-substances—or at least some of them—are essentially ordered to one another in both final and efficient causal series. Scotus hints that this is what he has in mind in *QMet* VII.20, ¶ 38, where he invokes Aristotle’s authority for the view that in the generation of blooded animals the heart is formed before other parts:

According to the Philosopher the heart is generated first—even temporally—before the other parts of an animal. And he would assign in the generation of an animal—speaking of the whole—many complete changes to many forms of parts, one before the other in time.⁷⁸

In at least one important passage in which Aristotle expresses this view, he says not only that the heart is generated first but also that it is an efficient cause of the generation of the other parts, and is generated *for the sake of* other parts.⁷⁹ Scotus’s allusion to Aristotle’s embryology strongly suggests that he would endorse Aristotle’s idea that organic parts are causally ordered to one another. In the following I delineate these two ways in which Scotus might have thought that the parts of an animal are essentially ordered, starting with final causality.

First, there is good reason to think that the unity of order that obtains among several part-substances is the unity of an essentially ordered *final* causal series. In this view, two part-substances are unified just if one is, or comes to be, or acts, *for the sake of* another. On Scotus’s understanding of final causality, if producing blood and blood vessels is a final cause of producing the heart—if (part of) the heart’s function is to produce blood and blood vessels—then there is a causal series such that an efficient cause brings about the heart *for the sake of* blood and blood vessels. Some blood vessels are produced for the sake of carrying nutriments from the mother’s uterus, and some are produced for the sake of transporting blood to the region where the brain develops. The brain is produced for the sake of maintaining an optimum ratio of coldness to heat, and this ratio is supposed to be the mechanism by which the developing embryo can transform nutriments into organic parts—and therefore it is brought about for the sake of these organic parts.⁸⁰ Each final causal chain terminates at some activity of the whole organism composed of many part-substances, and therefore every part-substance comes to be for the sake of the whole, even if there is some pair of part-substances such that neither is a final cause of the other. When there is such a pair of substances, say p_1 and p_2 , p_1 and p_2 can still be essentially ordered to one another even if neither is a final cause of the other, for example in a nonevident essential order. Let w be a whole substance for the sake of which p_1 and p_2 are produced. If p_1 would not be final-causally ordered to w unless p_2 were final-causally ordered to w first, or vice versa, and neither is final-causally ordered to the other, then p_1 and p_2 stand in a

⁷⁸Scotus, *QMet*, VII.20, ¶ 38 (Bonaventure, IV.389–90): *Secundum Philosophum cor primo generatur—etiam tempore—ante alias partes animalis. Et esset assignare in generatione animalis—loquendo de tota—multas mutationes completas ad multas formas partium, unam ante aliam tempore.*

⁷⁹Aristotle, *Generation of Animals*, II.5.739b32–740a24 (Barnes, I.1148); and II.6.742b3–5 (Barnes, I.1152).

⁸⁰Aristotle, *Generation of Animals*, II.6.743a1–743b32 (Barnes, I.1153–54).

PNEO, since both are proximate effects of a common final cause, w . Now suppose that three more part-substances of w , p_3 , p_4 , and p_5 , are essentially ordered such that p_3 is a final cause of p_5 and p_1 is a final cause of p_3 and p_4 , but p_4 is not a final cause of p_5 . If p_5 would not be final-causally ordered to p_3 unless p_4 were first final-causally ordered to p_1 , then p_4 and p_5 stand in an RNEO, since both are remote effects of a common final cause, w .

There is also some reason to think that the sort of unity of order that obtains among organic part-substances is a unity of an essentially ordered *efficient* causal series. Again taking the cue from Scotus's endorsement of Aristotle's embryology, the heart's activity is supposed to initiate the efficient causal series that results in a complete organic body. It produces the blood vessels and the blood, the vessels transport the blood to the brain and the nutriments from the uterus, these effects go on to produce their effects, and so on. If there is an essential order of efficient causation among these organic part-substances, it does not obtain simply by virtue of one or more part-substances' efficiently causing the *existence* of another. The efficient causal order by which all the parts are brought into being fails to be an essential order because the causes do not cause simultaneously—the heart is generated before the blood, the blood before the brain, and so on. But if we think of a more or less complete organic body at some advanced developmental stage, where roughly all the parts have been produced, then it does seem plausible to suppose that there is an essential order of efficient causation among these parts, where the *activity* of one part, p_1 , is dependent on the *activity* of another part, p_2 , at the moment of p_1 's activity, and where some first part—the heart, according to Aristotle—is the first cause in the series. For example, according to Aristotle, the brain's cooling and heart's heating are partial causes of all that goes on in the body. If the heart or the brain is removed, it is not simply the case that the body loses a part-substance; additionally, the functioning of all the other parts ceases, since these activities are dependent on the ongoing activity of the heart or brain. In an essential efficient causal order such as this, the causal line can arrive at a fork, as in an order of final causality. Two effects on different prongs can nevertheless be nonevidently essentially ordered to one another such that every part is essentially ordered to every other part.

To say that every part is essentially ordered to every other part is *not* to say, however, that the parts of the body are interdependent or make up an organic system in which all the parts (or at least the vital parts) are needed not only for the life of the organism but for the ongoing functioning of any one of the parts. Instead, it is just to say that every part is either essentially prior or essentially posterior to every other part. Scotus would deny that the parts could be interdependent, because he is committed to the noncircularity of essentially ordered items. So if the brain is essentially dependent on the heart (in the order of efficient causality) and the heart is essentially dependent on the brain (in the order of final causality), then the heart is not efficient-causally essentially dependent on the brain, and the brain is not final-causally essentially dependent on the heart. For Scotus, an organic *first cause* is always required. One might object to my characterization of the unity of order of organic parts in terms of final and efficient essential orders along the following lines: One of the major motivations for pluralism about

substantial form (both standard and Scotistic pluralism) is that a corpse seems to be continuous with the living organism whose corpse it is. Standard pluralism allows us to say that Mole's corpse is the same body as Mole's body, because they are the same substance, informed by the same substantial form. But if the unity of Mole's fetal body consists in its parts' being efficient- and final-causally ordered to one another (which unity we rightly suppose the full-grown animal retains), then Mole's corpse cannot be the same body as Mole's body, because whatever unity the corpse has is not the unity Mole's body has.

The objection forces a nice clarification. In the view I am attributing to Scotus, Mole's corpse is not a substance, but neither was Mole's body. The *organism* was a substance because it was a composite of soul and an ordered unity of organic parts. The organs of an organism do not themselves cease to exist at the moment the organism ceases to exist, but the body they composed does cease to exist, because that body was constituted not only by organs *but also* by the final- and efficient-causal relations that these parts bore one to another, and these relations cease to exist when the organism ceases to exist. (Or, they cease to exist when the organism ceases to exist *under usual circumstances*. There is nothing in Scotus's theory that prevents these relations from persisting after death, since death would be a matter of the soul's separating from the body, and according to the theory these relations can obtain prior to ensoulment [e.g., during fetal development].) Thus, while it may be true that Mole's corpse is not the same body as Mole's, it is true that the (nonrelative) parts of Mole's corpse are the same as the (nonrelative) parts of Mole's body.⁸¹

To sum up Scotus's answer to the Special Potency Question: when Scotus says that several substances must have a unity of order in order to be perfectible by a substantial form or soul, he means that the substances must be essentially ordered to one another. Of the six essential orders of dependence, I have focused on final causality and efficient causality as plausible candidates for the sort of unity of order that Scotus may have had in mind in *QMet* VII, 20, n. 48.

8. THE ROLE OF SOUL IN SCOTUS AND TWO UNITARIANS

In Jean Buridan's commentary on Aristotle's *On Generation and Corruption*, he denies that integral parts have distinct substantial forms. According to him, the soul informs matter *prior* to the development of organs, so if there were substantial forms of integral parts, then they would inform the composite of soul and matter. But it is unfitting (*inconueniens*) that there should be a substantial form

⁸¹To go a little deeper into this issue: what is supposed to be scandalous about the unitarian position with respect to corpses is not just that the corpse is not the same body as the body of the organism whose corpse it is, but also and more startlingly that *no part* of the corpse is the same object as an *any part* of the organism whose corpse it is. In some criticisms of Aquinas, the corpse and the organism do not even share the same prime matter. Now, while Scotus is committed in the end to the idea that the corpse is not the same body as the body of the organism whose corpse it is, he is *not* committed to the idea that the parts of the corpse were never parts of the organism. Indeed, *all* of the (nonrelative) parts of the corpse (and many of its relative parts) were parts of the organism (at least within a sufficiently short period *post mortem*). I am grateful to Martin Tweedale for raising the objection that prompted this clarification.

of an organ such as a bone (Buridan's example) informing this composite, since the soul is more perfect than bone. Therefore there is not a substantial form of bone.⁸² Buridan therefore holds that organ terms such as 'bone,' 'flesh,' 'head,' and 'finger' do not pick out substances but are instead *accidental and connotative* terms, necessarily defined with reference to specific functions of a living organism.⁸³ In Buridan's view, the gradual process of differentiation into the sorts of parts that can support the life functions of Mole is directed by Mole's sensitive soul: some mere sequence of changes is a process on the way to the generation of a living thing because there is a single form at work, structuring matter in the appropriate ways; the sequence of changes is therefore a sequence of changes *in* one substance, Mole.⁸⁴

Scotus would object to Buridan's account on the grounds that a substantial form perfects whatever it informs, such that a composite of matter and a substantial form of some kind *K*, is a full-fledged *K*, and not in process of becoming a *K*.⁸⁵ But Scotus also holds that a *K*-form can only inform a subject that is ready to support the sorts of activities that a *K* characteristically performs, and therefore requires a more or less fully developed body in which to perform its characteristic functions.⁸⁶ As far as I can tell he does not argue for this claim; it appears to be a basic feature of Scotus's hylomorphism about substance. This leaves Scotus in need of some explanation of how a *sequence* of substantial changes (a heart develops, then blood, then a brain, and so on) is also a *process* on the way to the generation of Mole. As we have seen, Scotus deploys a metaphysics of essential orders, and in particular an essential order of final causes, to explain how discrete generations of substances are in fact generations of things destined to be parts of an organism.

Aquinas agrees with Scotus that the soul begins to inform matter not at the moment of conception but at some more advanced stage of fetal development, and therefore both agree that a mole fetus is not really Mole (or any other mole) until Mole's sensitive soul is induced. But unlike Scotus, since Aquinas is committed to unitarianism, and since the fetus is supposed to be either a substance or composed of substances, it is strictly speaking false to say that the soul begins to inform the fetus; instead the fetus and all of its integral parts are corrupted at the moment at which Mole is generated.⁸⁷ For Aquinas, then, it is inaccurate to say

⁸²Buridan, *Quaestiones super De generatione*, Book I, Chapter 8, Lines 94–108, 164.

⁸³Buridan, *Quaestiones super De generatione*, I.8.167–73.

⁸⁴These claims about Buridan are controversial. I make them on the basis of Buridan's commentary on *On Generation and Corruption*, but the better known commentary on *De Anima* presents what at first blush looks like a contrasting picture of the soul's relation to organic parts. In this text, the soul apparently informs a body that is already differentiated into different kinds of organic parts. See Buridan, *Quaestiones in Aristotelis De Anima*, Book II, Questions 4–5, 249–78. I think that the *De Anima* account can be read as consistent with my interpretation of the one in *On Generation and Corruption*, but for the purposes of this paper I am interested in the view I attribute to Buridan only insofar as it serves as a foil to Scotus's view, so I reserve a defense of this claim for future work.

⁸⁵For those animals and plants that generate offspring by means of seed, Scotus says that the form of the seed does have some causal role in the generation of the organism, but that form is not the soul and moreover is corrupted at the moment when the first part of the animal is generated. See Scotus, *QMet*, VII.12, ¶ 40–44 (Bonaventure, IV.206–8).

⁸⁶Scotus, *Ordinatio*, IV.II.I.2.I, ¶ 284 (Vatican, XII.267).

⁸⁷Aquinas, *De potentia Dei*, 3.9.ad 9; *Summa contra gentiles*, II.89, ¶ 11; *Summa theologiae*, Ia.II9.2.

that the soul directs the development of the organs, since the organism and all of its parts begin to exist at the instant the soul begins to inform matter. For both Buridan and Aquinas, then, the soul does not simply unify organs but *makes* them.

A striking consequence of Scotus's metaphysics of part-substances is how little work it leaves the soul to do, relative to Buridan's and Aquinas's hylomorphic accounts. According to Scotus the organs of Mole both exist and function (in some sense) before becoming organs of Mole. It is then the soul's job to unify the organs, making them part-substances of one living substance. The special mark of a substantial unity by Scotus's lights is that there is some activity or activities that cannot be attributed to a part or parts of that unity. In the case of an animal, *sensing*—seeing, tasting, etc.—is the paradigmatic activity that indicates that an animal is one substance (albeit composed of part-substances), and not some less-than-substantial unity of part-substances.⁸⁸ The soul and the body, then, compose the whole substance that is the proper subject of sensing and other activities (if there be any others).⁸⁹ But all of the organs needed for performing these activities are *already there*, waiting, as it were, for the soul.

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⁸⁸Scotus, *QMet*, VII.20, ¶ 51 (Bonaventure, IV.393).

⁸⁹Scotus thinks that a substance is really distinct from its parts, and thus literally means that the *whole substance* and not its parts (taken singly or together) is the proper subject of some activities and properties. This aspect of Scotus's metaphysics of parts is discussed in Cross, "Duns Scotus's Anti-Reductionistic Account of Material Substance."

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