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## ARTICLES

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### John Dumbleton's Anthropology: The Human Body, the Soul, and its Powers\*

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#### Abstract

This article examines several key themes in the anthropology of John Dumbleton, one of the central figures among the so-called Oxford Calculators, who authored an extensive *Summa logicae et philosophiae naturalis*, much of which remains unexplored. It focuses on Dumbleton's main theses concerning the nature of the soul and its relation to the body, as well as the relations among the powers of the soul. The methodological premise of the article is that these theses should be analyzed in light of two overarching principles that characterize Dumbleton's thought: on the one hand, the application of the methods of the Oxford Calculators to anthropological, psychological, and physiological questions; on the other, reductionist claims that lead him to formulate original theories. After examining his conception of the soul and the body (Section 2), the article turns to his account of the relations among the psychological powers (Section 3). It then analyzes the way in which Dumbleton applies the methods of the Oxford Calculators to anthropological questions (Section 4), before considering the various aspects of his reductionist approach to psychology (Section 5).

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## 1. Introduction

Little is known about the life of John Dumbleton. Probably born ca. 1310, he was a fellow of Merton College in 1338–1339, where he appears in the records alongside William Heytesbury and Thomas Buckingham. He was appointed to Queen’s College in 1340, and studied theology in Paris around the mid-1340s, before returning to Merton College in 1347–1348. He seems to have died shortly thereafter, leaving his major work, the *Summa logicae et philosophiae naturalis*, unfinished.

A central figure among the so-called Oxford Calculators, his thought nevertheless remains understudied. In fact, historians of ideas who have engaged with his work have focused primarily on the themes most characteristic of the physics of the Calculators, namely the mathematical analysis of motion and velocity (although a critical edition of the first part of the *Summa*, devoted to logic, is currently in preparation).<sup>1</sup> The greater part of the *Summa* remains unexplored, even though it addresses numerous topics treated by no other ‘Oxford Calculator,’ such as the functioning of the body, its organs, and their functions, or the perceptive faculties.

From an anthropological standpoint in particular, Dumbleton’s *Summa* offers a detailed analysis of the human faculties, contained in the last two parts (8 and 9), which in fact constitute half of the properly “natural philosophical” portion of the *Summa*. Here, Dumbleton examines the various faculties of the human soul, especially its vegetative, motor, and sensitive powers. An especially interesting feature of these analyses is the way they closely intertwine psychology and anthropology on the one hand—by studying human faculties in detail—and the physical study of their objects on the other (e.g., sounds, odors, and so forth).

While the content of the ‘natural philosophy’ parts of the *Summa* remains largely unexplored, the style of this work has also attracted relatively little attention from historians, perhaps because it differs considerably from the other writings left by the so-called Oxford Calculators. First, the *Summa* was quite evidently composed for a broader audience, possibly even including, beyond students of the Faculty of Arts, students of theology as well: it contains sections of relatively accessible exposition and occasionally

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<sup>1</sup> See Sylla, 1991a; Weisheipl, 1957, 1959; Molland, 1995; Bartocci & Read, 2022; Read, 2022.

adopts pedagogical strategies, indicating that the work was not intended solely for natural philosophers versed in mathematical techniques. Moreover, the work further distinguishes itself from the production of other Calculators through its use of philosophical authorities, which is more extensive than in most of their writings. In his investigations, Dumbleton frequently invokes Aristotle's authority, often in the form of dicta or axioms characteristic of scholastic Aristotelianism (such as *omne agens agit sibi simile*), which he seeks to test—returning repeatedly to such principles across different parts of the work. But he also frequently cites other authorities, such as Averroes and Avicenna, as well as numerous ancient and medieval sources more occasionally, such as Democritus, Porphyry, Alhazen, the *Liber sex principiorum*, Robert Grosseteste, Thomas Aquinas, or Giles of Rome.

The aim of this paper is to examine certain themes in Dumbleton's anthropology in order to provide an overview of this dimension of the *Summa*, sketching his main theses concerning human nature—namely, the structure of the body, that of the soul, and the interactions among psychological faculties.<sup>2</sup> In doing so, it will be shown that the anthropological positions Dumbleton defends rest on a few guiding principles that characterize his thought as a whole. One of the few specialists to have attempted—albeit in a very incomplete manner—to provide an overview of the entire *Summa* and its style, James Weisheipl, described Dumbleton's thought as a combination of the major doctrines of two prominent English authors: Thomas Bradwardine (ca. 1290–1349) and William Ockham (ca. 1287–1349). In light of what we today know about Dumbleton and the intellectual context of his time, this characterization is not entirely mistaken, but is somewhat misleading and reductive. In fact, I shall argue that one can indeed account for certain aspects of his anthropology through the lens of methods characteristic of the Oxford Calculators more generally (rather than of Bradwardine in particular), as well as through a philosophical stance that I would describe not as 'Ockhamist,' but more precisely as reductionist—leading at times to positions that are, in fact, anti-Ockhamist.

The paper is structured as follows. The first part offers an overview of the structure of the human composite according to Dumbleton, i.e., the structure of the body and the soul (Section 2). I then turn to his account

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<sup>2</sup> A few aspects of Dumbleton's anthropology are covered in Roudaut, 2021, pp. 263–277.

of the powers of the soul and, more specifically, to their distinction (Section 3). Subsequently, I will examine how Dumbleton employs quantifying techniques typical of the Oxford Calculators in order to investigate the relation between the psychological powers, particularly in operations involving several cognitive elements, such as perceptual judgments (Section 4). The next section sets out what I refer to here as Dumbleton's 'reductionist positions' in matters of anthropology, expressed in various ways and culminating in the assimilation of the operations of the soul to the soul itself (Section 5), before drawing some conclusions, the most important of which is that Dumbleton uses a calculatory framework in support of a fundamentally physical approach to the faculties of the mind (Section 6).

## 2. The Body and the Soul(s)

To understand Dumbleton's original positions regarding cognition and the powers of the soul, it is necessary first to grasp the principles underlying his anthropology, which determine the fundamental theses he advances concerning the soul and the body. Dumbleton conceives of the human body as a heterogeneous and composite structure. In line with a fairly standard view of his time, he holds that the body is composed of a set of organs, each possessing its own complexion or proportion of qualities.

Dumbleton holds that the elements or, more precisely, the substantial forms of the elements composing these organs remain within the mixture, albeit in an attenuated manner. It is thus not only the case that qualities admit variation in intensity—a general presupposition of the philosophy of the Oxford Calculators—but also that elementary substantial forms themselves, at least insofar as they exist concretely (considered *in concreto*) in matter, are likewise subject to such variation.<sup>3</sup> This thesis—according

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<sup>3</sup> Dumbleton, *Summa*, pars II, cap. 39–40, Worcester, Cathedral Library, F.6, ff. 18vb–19rb. Many manuscripts containing parts of Dumbleton's *Summa* do not preserve it in its entirety. Besides the aforementioned manuscript, it can be found in its complete or nearly complete form in the manuscripts Cambridge, Gonville and Caius College, 499/268; Vatican City, BAV, Vat. lat. 6750; Dubrovnik, Dominikanski Samostan, 32 (36-IV-8) (parts I–VIII); Vatican City, BAV, Vat. lat. 954 (parts II–IX); Venice, Biblioteca Nazionale Marciana, lat. VI. 79 (2552); or Paris, BnF, lat. 16146. The codex Worcester, Cathedral Library, F.6 used in this study was established as the most reliable

to which the form of the elements persist in corporeal mixtures, generally attributed in the Middle Ages to Averroes—is coupled, in Dumbleton's case, with a relatively original claim for the period: the primary qualities of the elements (heat, cold, dryness, moisture) as well as secondary qualities (colors, sounds, and so forth) inhere in prime matter, and not in the substance properly speaking (that is, not in the hylomorphic compound).<sup>4</sup> For Dumbleton, matter therefore represents a positive entity that plays a direct role in nature, independently of form, by being the immediate substratum of qualities.

The thesis that forms having different intensities remain in the same mixtures enables him, as we shall see, to explain various properties of the sensitive powers; but more generally, it allows him to account for how different tendencies concerning the same type of action (e.g., moving) can coexist within a single being, whether animate or inanimate. Thus, for example, an object such as a magnet may attract iron while still retaining its fundamental tendency to fall downward as a heavy body. Similarly, an animal, while moved in one respect as a heavy body toward its natural place, may at the same time be inclined toward other objects due to its appetites.<sup>5</sup> These diverse tendencies can coexist in a single being since a plurality of different elements, each of which possesses a certain degree of intensity, remains present in the mixtures (organs) composing the body.

Dumbleton thus emerges as a defender of the thesis of the plurality of forms regarding the body. As we shall now see, he endorses the same view regarding the soul.<sup>6</sup> Although he admits the existence of different substantial forms in a being, Dumbleton is hesitant regarding the exact

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manuscript of the *Summa* by Stephen Read and Barbara Bartocci, who have prepared the edition of its first part, devoted to logic. I am grateful to them both for this information and for having shared with me the stemma they produced. The division of the parts into chapters indicated here corresponds to that found in this manuscript. The readings were checked, where necessary, against Paris, BnF, lat. 16146.

<sup>4</sup> This idea can already be found before Dumbleton, for instance in Peter Auriol, *Commentaria in libros Sententiarum*, lib. II, dist. 12, q. 1, art. 6 (see Friedman, 2021, pp. 138–140); Pasnau, 2011, pp. 108–114, 585–587. See *Summa*, III, cap. 16, f. 25ra–vb; cf. II, cap. 39, f. 19ra; IX, cap. 23, f. 146ra; cap. 38, f. 159rb.

<sup>5</sup> Dumbleton, *Summa*, pars VIII, cap. 17, f. 105ra–rb.

<sup>6</sup> On this general problem, see Zavalloni, 1951. On the particular case of bodily structures, see Ward, 2014, pp. 76–93; Pasnau, 2011, pp. 630–632.

number of such forms within a complex being such as the human soul. When examining the manner in which the different faculties or powers of the soul are organized and gradually generated during the process of embryogenesis, Dumbleton appears to incline toward a model that admits three souls in the human being, corresponding to its principal functions (vegetative, sensitive, intellectual):

From these authors, three [propositions] become apparent. The first is that the seed is truly animated [...]. The second is that the nutritive soul is induced before the sensitive or the intellective soul in an individual in whom they are suited to inhere. The third is that the intellective soul comes from outside and is not educed from the potentiality of matter. Fourth, it is inferred from these that there are necessarily three souls in a human being, two in a brute animal, and one in a plant.<sup>7</sup>

However, later in Part 8 of the *Summa*, after analyzing the problem at greater length, Dumbleton formulates four suppositions that, in his view, are beyond dispute: (1) a natural composite is constituted of matter and form; (2) each composite is constituted of a homogeneous matter to which a form is united; (3) a material form perfects only the matter directly associated with it; and (4) a form cannot simultaneously inform two matters of different complexions directly in the same way. From this, he concludes that *only two souls* are sufficient to explain the diversity of operations observable in the human being, which contains only one supernatural form (the intellective), perfecting a composite constituted of corporeal matter and the sensitive soul:

It should therefore be said that a human being has only two souls, namely, one nutritive and another intellective. This [nutritive soul] in the first place forms a member to which the intellect is naturally conjoined. And other faculties are similarly produced and because the intellective soul has a relation to the matter disposed to it in its conjoining, this soul is not conjoined unless there are members by which a human cognition can be possible—and it has

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<sup>7</sup> Dumbleton, *Summa*, pars VIII, cap. 11 (f. 106ra): “Ex hiis auctoritatibus patent tria. Primum quod semen verum est animatum [...]. Secundum est quod prius inducitur anima nutritiva quam sensitiva vel intellectiva in individuo in quo sunt natae illae tres animae inexistere. Tertium quod anima intellectiva ab extra venit et non educitur de potentia materiae et quartum infertur ex hiis quod tres sunt animae in homine necessario, et duae in bruto, et unica in planta.”

this relation because it cannot be educed from the potentiality of matter, as will be clear below, and it understands with those [members] with which it can operate in cognition of a thing. And therefore it can perfect the whole heterogeneous body, although primarily and principally it perfects some matter of a determinate complexion so that it may perfect an individual in order that a human results [...].<sup>8</sup>

Despite hesitating on the precise number of substantial forms within the soul, Dumbleton, like Ockham, ultimately concludes that only two forms constitute the human soul. Unlike Ockham, however, he describes the soul to which the intellect is added as “nutritive” (and not “sensitive”). This view goes together with an original conception of the body’s structure, as we have seen: Dumbleton postulates a complex organization composed of elements that are themselves ultimately constituted of qualities inhering in prime matter and capable of variation in intensity. It is on this basis that we can now present more precisely his conception of the soul’s powers.

### 3. The Powers of the Soul

Dumbleton frequently adopts a reductionist perspective on the problems he addresses. However, he maintains, as we have seen, that postulating multiple forms is necessary to account for the operations of the human being. While he accepts the idea that one and the same form or power can give rise to different operations, he nonetheless holds that a given type of physical complexion can produce only one type of form (i.e., an organ or a power)—an idea consistent with his view that the different organs of the body possess distinct complexions.

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<sup>8</sup> Dumbleton, *Summa*, pars VIII, cap. 15 (f. 102rb): “Dicendum ergo quod homo duplicem habet animam solum, scilicet, unam nutritivam et aliam intellectivam. Haec nutritiva format primo membrum cui naturaliter copulatur intellectus, et similiter alia competentia producuntur, et quia intellectiva habet respectum ad materiam sibi dispositam in copulatione sua, non copulatur haec anima nisi sint membra quibus contingere potest cognitio hominis et hanc relationem habet quia non potest educi de potentia materiae ut infra patet et intelligit cum quibus potest operari in cognitionem rei. Et totum ideo corpus heterogeneum potest perficere licet primo et principaliter materiam certam in complexione ut individuum resultet humanum perficiat [...].”

He articulates this principle through the theory of proportions, the favored mathematical framework by which the Oxford Calculators analyzed motion and other natural phenomena,<sup>9</sup> which he applies to the structure of the organs and their respective complexions. The sensitive powers of touch, taste, and vision, although they may be extended in common parts of the body, have different “subjects,” in the sense that, since it is impossible for two forms to result from the same proportion of qualities, they must have differently qualified matters as their respective subjects (different nerves, for instance). Dumbleton mentions an argument against his view and replies to it:

Furthermore, the form of touch and the visual power are extended in the same matter and through the same matter, as is clear because the nerve of touch is extended through the whole body of the animal and the sense of vision through some part of it. Likewise, taste is extended with touch in the tongue; therefore, the same proportion regarding diverse forms in species disposes the mixed matter—which is the principal thing sought. Here, it can be said that just as secondary forms have different matters, so primary forms have different subjects [...]. From this deduction what was deduced earlier follows, namely, that if each primary form required prime matter, then each superadded form would naturally require a single geometric or arithmetic proportion, and then the mixed form would only remain one single instant during the alteration of the mixture.<sup>10</sup>

From a terminological point of view, let us first note that by the term “form,” Dumbleton understands both the organ and the corresponding sensory power, which he tends to identify with one another—a point that will be emphasized below. Second, let us note that this text does not explicitly

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<sup>9</sup> On the importance of this mathematical theory in the Calculators tradition, see Sylla, 2008.

<sup>10</sup> Dumbleton, *Summa*, pars VIII, cap. 2 (f. 93va): “Item idem arguitur forma tactus et virtus visiva in materia eadem et per eandem materiam extenduntur ut patet quia per totum corpus animalis extenditur nervus tactus et per aliquam partem sensus visus. Item gustus cum tactus extenditur in lingua ergo eadem proportio respectu formarum diversarum in specie disponit materiam mixtam quod est quaesitum principale. Hic potest dici quod sicut formae secundae habent diversas materias, ita formae primae habent diversa subiecta [...]. Ex hac deductione sequitur illud quod prius deducitur, scilicet, quod si quaelibet forma prima primam materiam exigeret, ergo quaelibet forma superaddita unam proportionem geometricam sive arithmeticam exigeret naturaliter et tunc solum per instans maneret forma mixta in alteratione mixti.”

assert a strict *identity* between a form and its corresponding proportion of qualities. Nevertheless, the claim that two distinct forms cannot arise from the same proportion introduces a strong uniqueness constraint that goes beyond mere dependence and is more akin to a relation of constitution. Here, by a relation of constitution, is meant a relation according to which the form is metaphysically grounded in and determined by it, such that its identity is fixed by that material structure.<sup>11</sup> Because the proportion of qualities fixes which form can be present, the diversity of forms or powers can be reduced to differences in material basis, with the explanatory priority for this diversity lying with the structure of the material substrate (composed of prime matter and a proportion of elementary qualities) rather than with irreducible psychological powers.

The same principle, establishing the uniqueness of a form corresponding to a given proportion of quality, is mobilized on several occasions by Dumbleton—for instance, in his account of how a substance is assimilated by the organism during the process of digestion, or in his discussion of the distinction between a sensitive element and the will within the same soul.<sup>12</sup> The insistence that each substantial form or power corresponds to a distinct proportion of qualities—and that differences in high-order powers track differences within such proportional ranges—suggests a bottom-up model of metaphysical constitution. The same elemental constituents underlie all natural transformations, yet it is the variation in their proportion that accounts for the resulting diversity of forms (whether bread, blood, fly, or stone).

Despite offering highly detailed analyses of the various nutritive and sensitive faculties of the soul and of their objects, Dumbleton does not explicitly address the broader problem of the precise nature of the relation

<sup>11</sup> On the relations between dependence, grounding and reduction, see Rosen, 2010.

<sup>12</sup> See Dumbleton, *Summa*, pars VIII, cap. 2 (f. 93vb): “Unde ponendum est quod una est latitudo proportionum respectu unius agentis tanquam materiam et alia est latitudo respectu alterius ut respectu panis est latitudo una et respectu sanguinis alia, et eadem sunt elementa in quibus illa transmutatio fit ex qua resultant illae latitudines diversae. Unde licet sexquialtera proportio [i.e., 3 : 2] differat a dupla [i.e., 2 : 1] in specie et sexquitercia [i.e., 4 : 3] magis tamen differt una illarum a dupla quam reliqua sic tota latitudo certa proportionum inter formas primas aliter se habet ad agens quando producit muscam quam se habet quando producit lapidem.” On the sensible and the will, see *Summa*, pars VIII, cap. 12, f. 106vb.

between the soul and its powers—a classic issue in medieval psychology.<sup>13</sup> He does, however, provide some information in Parts 8 and 9 of the *Summa* concerning the organization of the powers within the soul. While he holds that there are two souls in the human being, he nonetheless distinguishes three principal types of operation—nourishing itself, sensing, and cognizing.<sup>14</sup> This tripartition grounds the distinction between three main parts of the soul: vegetative, sensitive, and intellective.

Although the *Summa* as it has come down to us lacks more developed discussions of intellectual operations, Dumbleton does provide at this point a detailed account of the structure of the sensitive part of the soul, which he divides, in quite traditional fashion, into the five external senses on the one hand, and the internal powers on the other. A noteworthy aspect of his presentation is that, while Dumbleton acknowledges the possibility of subdividing the internal senses further, taking into account the estimative faculty postulated by Avicenna, he restricts them to just three: the common sense, imagination, and memory.<sup>15</sup>

This division of powers should not be understood as a distinction between wholly separate faculties. Indeed, many psychological acts involve the cooperation of several powers, raising different questions concerning how these powers are articulated in relation to one another. As we shall now see, these problems are analyzed by Dumbleton through the lens of his quantifying approach to psychological phenomena, on the one hand, and of his reductionist theses, on the other.

#### 4. A Quantifying Approach to Psychological Powers

Dumbleton's *Summa* contains numerous analyses that examine the functioning of the faculties and their interactions, employing the vocabulary of the intensity of degrees, which allows him to quantify and sometimes “calculate” such phenomena. Let us begin this section—devoted to giving a few significant examples of such analyses—by examining a problem which arises at the very junction of soul and body and concerns

<sup>13</sup> For an overview, see Löwe, 2025, and the bibliography therein.

<sup>14</sup> Dumbleton, *Summa*, pars VIII, cap. 16, f. 102va.

<sup>15</sup> Dumbleton, *Summa*, pars IX, cap. 1, f. 118ra.

the intensification of perceptual acts. While it seems that we can perceive certain objects with greater or lesser intensity, like a color appearing more or less bright, it is far from clear whether such intensification belongs to the sensory act as such. In other words, it is not clear whether such an experience stems from (a) the sensible impression itself—that is, from the physical dimension of sensation—or rather from (b) the sensitive act itself, belonging to the soul, by which this impression is made present to it.

Discussing this problem, Dumbleton first puts forward an argument claiming that perception cannot vary in intensity. According to this argument, the act of sensing or the act of judging that an object is present (which Dumbleton seems to equate), like the earth's natural motion, is fixed and unchangeable, which entails that the intensification depends only on the strength of the sensible impression, while the act of judging itself always remains the same. However, an analogy with another psychological power offers a counter-argument: just as the will can act with greater or lesser intensity, so too should the sense be capable of having a more or less intense act.

To analyze this problem, Dumbleton introduces an example. He supposes that one person ("Socrates") perceives an object *A*, having a certain degree of intensity, through a sensible intention *B*, and another (less intense) object *C* through a weaker sensible intention *D*. If the only difference between these two acts of perception lies in the intentions (*B* being stronger than *D*) and not in the sensory acts themselves, then the perceptual act as such cannot be said to be more or less intense—for judging is an act of the sensitive soul which, by hypothesis, would not admit of degrees of intensity or remission.<sup>16</sup> Still, even if there exists a difference of intensity in the sensible impressions, Socrates does not *necessarily* produce a more intense perceptual judgment about them, since an impression can occur without judgment, as in sleep.

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<sup>16</sup> Dumbleton, *Summa*, pars IX, cap. 21 (f. 143vb): "Item si actus non potest intendi ergo sensus non potest iudicare intensius unum oppositum quam aliud. Consequentia sic arguitur. Habeat Sortem de A subiecto B intentionem et comprehendat Sortem A per B sub certo gradu ut videtur satis possibile et iudicet illud Sortem C obiectum remissius A per D intentionem remissiorem B. Si solum est iudicium Sortis dissimile inter C et A propter intentiones dissimiles solum et non propter actus in se cum iudicare sit actus animae sensitivae qui per positionem est indivisibilis quantum ad intensionem vel remissionem, ergo iudicium illud non intenditur nec remittitur quare non iudicat Sor A intensius quam B [...]."

In the end, while Dumbleton acknowledges that the acts of psychological faculties (such as those of the will) are intrinsically subject to intensification or remission, he nevertheless opts for the solution that locates the ultimate cause of perceptual intensification in the sensible impression itself. As we shall see, this thesis is consistent with Dumbleton's broader claim that perception is essentially a passive act, one that does not involve any proper activity on the part of the soul:

[...] Here it should be said that this act is intensified through the intensification of the passion produced in the sense, as the arguments rather seem to conclude for that side. And regarding foundation of the argument, it should be said that since the appetite inheres in the earth from its generation and is not acquired by it from something external, just as the sense acquires its own act, therefore that appetite of the earth is not intensified but the act of the sense is a single effect following upon the passion produced in the sense [...]. For since the act in itself, insofar as it is comprehension, does not take on intensification or remission except from an intensification of a passion, their latitudes—that is the latitude of acquired intensification and the latitude of the act—therefore begin together and are intensified and remitted equally, just as the latitude of proportion of greater inequality and the latitude of motion depending on it.<sup>17</sup>

The foregoing example involving two objects *A* and *C* represented through two intentions *B* and *D* is noteworthy in that it illustrates one of the characteristic methods of the Oxford Calculators. Stylistically, the argument proceeds by means of a thought-experiment involving arbitrarily chosen quantitative values, denoted by letters. Such a manner of exposition, distinct from a strictly syllogistic mode of reasoning, more closely resembles a mathematical demonstration in which a particular case serves, by virtue

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<sup>17</sup> Dumbleton, *Summa*, pars IX, cap. 21 (f. 144ra): “Hic dicatur quod actus ille intenditur per intensionem passionis factae in sensum sicut argumenta videntur illam partem magis concludere. Et ad fundamentum dicatur quod cum appetitus inest terrae a generatione sua et non acquiritur ei ab extrinseco ut sensus acquirit sibi actum suum, ideo non intenditur ille appetitus terrae sed actus sentiendi est unus effectus sequens passionem factam in sensum [...]. Nam cum actus secundum se prout est comprehensio non capit intensionem nec remissionem nisi ex intensione passionis, ergo latitudines eorum, scilicet latitudo intensionis acquisita et latitudo actus, simul incipiunt et intenduntur et remittuntur aequaliter sicut latitudo proportionis maioris inaequalitatis et latitudo motus ex ea dependens.”

of its arbitrariness, as a general instance. Perhaps even more than demonstrations featuring numerical values, the use of arbitrary objects (denoted by letters) together with the terminology of degree, latitude and proportion is typical of the Calculator tradition.<sup>18</sup> Here, the demonstration aims to establish that the variation in intensity (or “latitude”) of the sensory act or perceptual judgment cannot occur without a parallel variation in the intensity of the sensible impression. One could certainly relate this approach to the analyses conducted in a theological context, within the circle of the so-called Oxford Calculators or by authors close to that circle, such as Richard Kilvington, Robert Halifax, or Roger Roseth, concerning the rational faculties (intellect or will); however, this application to the sensory faculties and their object is what makes Dumbleton stand out.<sup>19</sup>

A related problem appears elsewhere in Dumbleton's *Summa* through the notion of certainty, also analyzed through the quantitative framework of degrees of intensity. In a brief overview of his work, Edith Sylla has shown how Dumbleton employed the theory of the intensification of qualities to explain the way in which certainty in knowledge is established, as opposed to doubt or hesitation.<sup>20</sup> She noted that Dumbleton applies concepts inspired by the ‘new rule of motion’ (attributed to Bradwardine) to the psychology of belief. In this context, he uses the terms *intensio* and *extensio*—which normally designate, respectively, the degree of intensity of a quality and its extension—to refer instead to the number of pieces of evidence generating firmness in belief (extension) and the associated degree of certainty or hesitation (intensity). This conceptual transfer makes it possible, at least in principle, to calculate how quickly one will change one's mind upon receiving a new belief contrary to those previously held as true. The new proposition functions as a “force” acting on the set of contrary beliefs already acquired, which themselves provide the ‘resistance’ opposed to the acceptance of this new belief.<sup>21</sup>

Dumbleton returns repeatedly to the problem of the causes and modalities of the intensification of different phenomena. With regard to sensible appetite or desire, for instance, he examines the manner in which a desire

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<sup>18</sup> For discussion on this point, see Thakkar, 2002, esp. pp. 197–202.

<sup>19</sup> For examples, see the studies compiled in Lukács & Michałowska, 2024.

<sup>20</sup> Sylla, 1991b, pp. 133–137.

<sup>21</sup> Dumbleton, *Summa*, pars I, cap. 18, ff. 7va–8rb.

may intensify over time in relation to a representation (or “intention,” in the technical vocabulary of the period) through which the desire is directed toward an object. The desire, however, does not in itself suffice to account for the process of intensification; when it comes to purely natural appetites, the causality of the object is required for the desire to intensify.<sup>22</sup>

We have seen how Dumbleton interrogates the nature of the connection between judgment and sensible impression by comparing the way their respective “latitudes” (i.e., the variations of their intensity) evolve. In the case of a sensible impression and a perceptual judgment, these two latitudes evolve equally. Yet Dumbleton also highlights other cases in which the different latitudes involved in a single cognitive act are neither proportional nor commensurable. This point is important because, in Dumbleton’s view, where a relation of constitution or even causal dependence between two things must be manifested through a relation of proportion between them (for example, between forces and motion, or between qualities and a form), the absence of comparability means that the two phenomena under consideration are independent. For instance, when asking whether the sensible impression of an object on the sense is identical to the intention generated within the soul (as, for example, in visual perception), Dumbleton rejects this claim and states that the latitudes of a psychic intention and of a sensible impression are not *comparable*:

[...] It is clear, from the Commentator’s intended meaning, that the intention is of a diverse species from the material sensible, the latitudes of this [sensible] and of that intention are not properly comparable [...].<sup>23</sup>

This, he explains, is because the intention is not of a physical nature but rather “spiritual,” unlike the sensible impression, making their mathematical comparison impossible, since two things, in order to be compared, must belong to the same genus or at least share a certain common nature.<sup>24</sup> Here, the heterogeneous character of two cognitive elements (one physical, the other spiritual) has the implication that their respective latitudes are not

<sup>22</sup> Dumbleton, *Summa*, pars VIII, cap. 1, ff. 92vb–93ra.

<sup>23</sup> Dumbleton, *Summa*, pars IX, cap. 21 (f. 144ra): “[...] Apparet ex intentione Commentatoris quod intentio est diversae speciei a sensibili materiali, latitudines illius et intentionis non sunt proprie comparabiles [...]”

<sup>24</sup> Dumbleton, *Summa*, pars IX, cap. 21, f. 144ra; cf. cap. 22, ff. 144vb–145va.

comparable—this essential difference in nature between the two being thus expressed in terms of a mathematical relation.

Taken together, these analyses show how features generally assumed to be typical of the Oxford Calculators' methodology—i.e., the application of the mathematical theory of proportions to different objects and the appeal to thought-experiments involving numerical variables—are brought to bear on the investigation of the faculties and their operations. More precisely, while the demonstrative procedures typical of the Calculators are frequently employed, it is above all the conceptual framework of degrees of intensity that enables Dumbleton to address a number of the problems under consideration. Examining the conditions of intensive variation in the objects under study allows him to assess the respective roles of the faculties in human cognition.

## 5. Reductionist Stances

Let us now turn to the ways in which Dumbleton's generally reductionist positions (but not specifically "Ockhamist," *pace* Weisheipl) lead to original theses regarding the functioning and interrelation of the powers of the soul. These positions are reductionist in several respects.<sup>25</sup> First, in the sense that Dumbleton believes that some phenomena can be explained in terms of lower-level material entities and processes that constitute them. Dumbleton's *Summa* indeed reveals a clear interest in atomistic and, more generally, corpuscularian positions.<sup>26</sup> It contains, for example, a detailed exposition of Robert Grosseteste's atomistic cosmology,<sup>27</sup> atomistic hypotheses in psychology intended to explain perception, and discussion of various atomistic theories of the soul. One aspect that has gone unnoticed by the few readers who have ventured into Dumbleton's *Summa* is that, alongside Democritus and Epicurus, he also mentions atomists, one of whom—most remarkably—seems to have been his contemporary. Among them appears indeed a certain "Nicholas," who most

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<sup>25</sup> Here, the focus will be on ontological reductionism (designating relations between entities), according to which one entity is constituted by another or, more radically, is identical to it, rather than on an epistemological relation (between theories or concepts). On this notion, see Sarkar, 1992; Gillett, 2016.

<sup>26</sup> On atomism in the Latin Middle Ages, see the studies compiled in Grellard & Robert, 2009.

<sup>27</sup> Dumbleton, *Summa*, pars IX, cap. 34, ff. 155rb–vb.

likely refers to Nicholas of Autrecourt, making this one of the rare surviving testimonies from the period concerning Autrecourt's thought.<sup>28</sup>

Without adopting them systematically, he regularly mentions corpuscularian hypotheses as possible explanations for certain phenomena, such as the mechanism of nutrition, the perception of flavors, or that of odors.<sup>29</sup> While he rejects atomism strictly speaking (as this theory implies the existence of the void, which he denies), he relies on such corpuscularian theses to explain particular phenomena. This is especially the case with physical phenomena of reaction, which are difficult to account for satisfactorily within an Aristotelian framework. In instances that he regards as otherwise inexplicable, he interprets them as sensory illusions arising from the exchange of small particles between the organs of touch and the sensible objects.<sup>30</sup> A very similar explanation is adopted around the same time by Richard Swineshead in his own treatment of the problem.<sup>31</sup>

Somewhat opportunistically, Dumbleton also places Democritus alongside Aristotle (and himself) in affirming the exclusively passive character of perception, in contrast with other psychological operations. He rejects the theory of vision advanced by those he calls the "Moderns," explicitly naming Grosseteste and Bacon, and more generally by proponents of extramission theories, according to which an activity of the soul is involved in the act of vision.<sup>32</sup> He likewise rejects the notion of an "agent sense," defended by John of Jandun and, closer to his own time and in a different version, by John Buridan.<sup>33</sup> Dumbleton thus maintains that no active power of the soul is involved in perception.<sup>34</sup>

<sup>28</sup> Dumbleton, *Summa*, pars IX, cap. 1, f. 118vb.

<sup>29</sup> On nourishing, see *Summa*, pars VIII, cap. 19, f. 111ra; cap. 21, f. 114rb; on the perception of flavors, see pars IX, cap. 15–16, ff. 136rb–va; on smells, pars IX, cap. 16, f. 137vb.

<sup>30</sup> Dumbleton, *Summa*, pars IV, cap. 4, f. 44va; see Caroti, 1995, esp. pp. 357–368.

<sup>31</sup> Richard Swineshead 1520, tract. VII, f. 29ra.

<sup>32</sup> Dumbleton, *Summa*, pars IX, cap. 40 (ff. 159vb–160ra): "Alii fuerunt qui non solum per exitum radiorum ab oculo dicunt animal videre sed duplicem causam ponunt, scilicet, radiorum exitum et interceptionem, id est, per passionem factam a visibili et huius sententiae sunt platonici et alii moderni Lincolniensis et unus qui Bacon cognominatur."

<sup>33</sup> On the history of this notion, see Pattin, 1988. On Buridan's interpretation of it, see Biard, 2005.

<sup>34</sup> Dumbleton, *Summa*, pars IX, cap. 4, f. 121vb.

A second noteworthy aspect of Dumbleton's reductionism lies in the consequences he draws from his conception of quantity. For him, quantity is not something really distinct from substance and quality, since he admits only these two categories as 'real' in his ontology. While this idea is in line with Ockham's views, the conclusions he derives from it are his own. Dumbleton argues that all the senses perceive quantity, although not all perceive shape or figure, the perception of which depends on the configuration of a given organ:

Regarding that objection, let it be noted that every sense necessarily perceives quantity, but not shape properly. One must make the distinction that certain senses are said to comprehend shape and quantity because they perceive the differences of shapes—as sight distinguishes between a square and a triangle, like touch does, but not so distinctly, and other senses perceive quantity but not figure [...]. Likewise, when a thing is touched by a hand, the intention is not caused by the whole tactile power, but by the firm application of the hand on certain part of the sense, the object is felt—because of this: that a figure is judged external shape, as other senses do, namely taste, smell, and hearing, since they receive the intention through their totality, therefore they receive quantity, but not the figure.<sup>35</sup>

The idea that quantity is perceived by all the senses has, of course, the immediate consequence of reducing the role for which the common sense as a power was posited, one of its principal functions in Aristotle being precisely the perception of quantity, which is not the proper object of any particular sense. Dumbleton indeed maintains that quantity is perceived *per se* (and not merely accidentally) by all the senses, and not only by sight and touch. According to him, common sensibles are not really distinct from

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<sup>35</sup> Dumbleton, *Summa*, pars IX, cap. 21 (f. 142vb): “Pro illa instantia notetur quod omnis sensus necessario percipit quantitatem sed non figuram proprie. Propterea distinguendum est quod quidam sensus dicuntur comprehendere figuram et quantitatem quia differentias figurarum percipit ut visus distinguit inter quadratum et triangulum similiter et tactus sed non ita distincte et alteri sensus precipiunt quantitatem et non figuram. [...] Item cum per manum unam res tangitur non per totam virtutem tactivam causatur intentio sed ad duram applicationem manus per certam partem sensus sentitur propter quod iudicatur figura ad extra sicut alii sensus, scilicet, gustus, olfactus et auditus quia per totum recipiunt intentionem et ideo licet quantitatem recipiunt non tamen figuram.”

proper sensibles; rather, they are “dispositions” of the latter that can be perceived *per se* by different senses. This is why he concludes that many common sensibles—such as quantity—are perceived *per se* by all the senses.<sup>36</sup>

Insofar as properties of quantity such as rarity or density are reducible to quantity, and since, as we have seen, primary qualities inhere directly in matter, Dumbleton maintains that touch directly perceives the affections of matter—the sense of hearing being another sense capable of experiencing material compression, though indirectly.<sup>37</sup> The sense of touch possesses a somewhat special status in comparison with the other senses. Unlike the latter, which primarily receive a “spiritual” intention, touch can be “really” (i.e., in its materiality) affected by its object and thus directly perceive intrinsic properties of matter such as contraction or dilation. According to Dumbleton, due to its capacity to perceive quantity and material qualities directly, the sense of touch thus perceives not only primary qualities but also (1) density and rarity, (2) contraction and dilation; (3) pleasure and pain, and (4) discontinuity within the body (e.g., lesion of the flesh or nerves) as well as distance.<sup>38</sup> It is interesting to note that Dumbleton here brings together properties that concern material substances in general, such as density and its variations, and psychological affections such as pleasure and pain. Whereas in the Aristotelian commentary tradition these properties tend to be studied separately—one belonging strictly to the physical domain and the other to the psychological—Dumbleton adopts a more psychophysiological approach, closer to that of physicians, who tend to study the two together. From his perspective, sensations such as pleasure and pain depend directly on the material properties of the animal body capable of perception—all these properties ultimately reducing to the relations between the material parts of the substance.

As we can see, Dumbleton’s ontology leads him to restrict the role of the internal senses by allowing a single power to perceive diverse properties, especially when these properties are reducible to the same underlying reality. Yet, the principles he adopts sometimes compel him to distinguish between different functions. For example, by maintaining that qualities

<sup>36</sup> Dumbleton, *Summa*, pars IX, cap. 21, f. 143ra.

<sup>37</sup> Dumbleton, *Summa*, pars IX, cap. 28, f. 150vb.

<sup>38</sup> Dumbleton, *Summa*, pars IX, cap. 19, f. 139rb; cf. pars IX, cap. 24, f. 147ra–b.

and substances are distinct, and that only one power can result from a particular proportion of qualities in matter, he concludes that two nerves are required for the sense of touch, which should therefore be subdivided into two distinct species:

First, that there are several touch-senses in species, that is, just as the common nerve necessarily, according to the Philosopher, has two nerves specifically diverse by which it receives color and taste, so too an animal necessarily has two tactile organs, and by one of them it only grasps the primary qualities and softnesses and hardnesses and other things of this kind, and by the other nerve the animal grasps heaviness and lightness, which are in the genus of substance [...].<sup>39</sup>

We may thus observe here, once again, the idea that there exists a bottom-up constitutive relation between a qualitative proportion and a form or psychological power. The distinct perceptual powers (in this case, species of touch) corresponding to the different categories perceived (substance or quality) necessarily imply a difference in the material conditions that realize them (that is, distinct nerves). It is particularly noteworthy that Dumbleton distinguishes here between two senses of touch, rather than merely two tactile organs, and that in this passage he identifies the sense (or psychological power) properly speaking to the bodily organ that realizes it.

Let us now turn to a third and final aspect of what might be called Dumbleton's reductionist stance, which concerns his conception of powers and operations. As has just been noted, when dealing with non-rational powers that do not involve the intellective soul—whose immaterial status makes it an exception in nature—Dumbleton tends to make no distinction between the notions of organ and power. He holds indifferently that a power or organ necessarily results from a given qualitative complexion, instead of defining a power as a quality inhering or located 'in' an organ. In other words, while there exists a strong constitutive relation between the qualitative proportion in matter and the organ it constitutes—without, however, implying a strict

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<sup>39</sup> Dumbleton, *Summa*, pars IX, cap. 17 (f. 138ra): "Primum quod plures sunt tactus in specie, id est, sicut nervus communis habet necessario apud Philosophum duos nervos diversos in specie quibus comprehendit colorem et saporem, ita habet animal duo organa tactiva et uno illorum comprehenduntur qualitates primae et molities et durities et cetera huiusmodi solum et alio nervo animal percipit gravitatem et levitatem quae sunt in genere substantiae [...]." Cf. pars IX, cap. 17, f. 138rb.

identity between them—Dumbleton appears to admit such an identity between the organ and the psychological power it enables. The psychological power thus reduces to the bodily organ in a robust sense (being identical with it, ontologically speaking).

Even more strikingly, Dumbleton draws radical conclusions from a central thesis of his ontology, namely that motion is not a reality distinct from the thing in motion.<sup>40</sup> This thesis in itself is not new and does not seem to entail any particular anthropological or psychological consequences. Yet Dumbleton draws from it remarkable implications. On the basis of it, Dumbleton identifies a “passion” in the case of touch—which normally designates a physical motion through which the body is moved—with the body (or flesh) as touched. Putting forward a hypothesis about how a passion affecting touch is transmitted through a nerve to the common sense by setting in motion the “subtle” and “fluid” parts contained within that nerve, he writes:

[...] Now since it could be said that this passion is not a thing distinct from that compressed [*condensata*] flesh, and since that passion [i.e., the one occurring in the nerve] is a thing distinct from that flesh, the passion is not another new intention caused as a passion received in the flesh. Hence, if such motion were a new quality induced, by the same reasoning, local motion would be a passion distinct from the moving thing, and the motion of alteration would be a thing distinct from what is altered [...].<sup>41</sup>

Dumbleton will then mention another explanatory hypothesis about how affections related to touch are transmitted to the common sense, but he will retain the idea that the passion as such (i.e., the affection of touch) is nothing other than the compressed flesh. Here, Dumbleton’s position on the nature of passion is reductionist in the same sense in which it was with respect to the relation between organs and psychological powers: Dumbleton posits a relation of identity between the passion and the flesh qua compressed.

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<sup>40</sup> For an overview of this problem, see Maier, 1958, pp. 59–143.

<sup>41</sup> Dumbleton, *Summa*, pars IX, cap. 19 (f. 140ra): “[...] Cum enim posset dici quod illa passio non est res distincta ab illa carne condensata, et quia illa passio est res distincta ab illa carne, passio non est alia nova intentio causata ut illa passio in carne comprehendatur. Unde si talis motus esset qualitas nova inducta pari ratione esset motus localis passio distincta a mobili et motus alterationis esset res distincta ab alterato [...].”

But the most intriguing application of this reductionist conception of motion lies in the relation of identity that Dumbleton seems to posit between a faculty and its operations. In the Middle Ages, while the thesis of the identity of the soul and its powers found some supporters, it was rarer to encounter the claim that the soul is identical with its *operations*, since the latter were generally regarded as distinct from the soul itself. Dumbleton, however, seems to identify not only a psychological power with that which possesses it (i.e., the soul) but also a power with its operations. This constitutes a remarkably strong claim—one defended, the secondary literature suggests, only by William Crathorn (fl. ca. 1330) at that time.<sup>42</sup> Although Dumbleton does not develop this point in detail, he upholds it in his discussion of the will and its volitions:

To the other [argument], when it is said that volitions would arise in us in some order, according to this position, and that then one would precede the other by necessity in one having two volitions at different times—to this it can be said that volition is not a thing diverse from the will, because if it were, [it would be] an accidental or substantial form, it would be produced naturally and would necessarily have a cause, from which its coming into being would stem—just as it happens in the generation of other natural forms. And because appetite and what has appetite are not distinct in the thing, nor volition and will, therefore with respect to no undergoing passive thing is there such a [natural] order so that it comes to be; but with respect to generated intentions by the mediating of which there is pleasure or sadness on account of which this or that volition happens, it is to be said that there is a natural order, just as in other generable forms—because volition does not follow after pleasure as though from an efficient cause and by necessity just as from the application of fire to wood the form of fire is produced; but this topic will be treated elsewhere.<sup>43</sup>

<sup>42</sup> Pasnau, 2002, pp. 245–301.

<sup>43</sup> Dumbleton, *Summa*, pars VIII, cap. 4 (f. 95ra–b): “Ad aliud cum dicitur quod volitiones in nobis fierent per ordinem iuxta positionem et tunc de necessitate una praecederet aliam in habente duas diversis temporibus. Ad illud potest dici quod volitio non est res diversa a voluntate, nam si esset forma accidentalis sive substantialis, illa naturaliter produceretur et haberet causam necessario ex qua sequitur productio sua in esse ut accidit in generatione aliarum formarum naturalium et quia non distinguuntur re appetitus et appetens nec volitio et voluntas, ideo respectu nullius passi est ordo talis ut ipsa fiant sed respectu intentionum genitarum mediantibus quibus est delectatio vel tristitia propter que accidit volitio vel volitio dicendus est ordo naturalis ut in aliis formis generandis

Dumbleton's argument implicitly relies here also on the thesis that there is no real distinction between a thing and its motion. Since actions such as volitions are themselves motions, it follows that there can be no real distinction between the power of willing and its operations and, more generally, between an agent and its action.<sup>44</sup> We thus see that Dumbleton's reductionist positions concerning the nature of psychological powers are articulated to varying degrees depending on the level under consideration. Whereas his conception of the powers of the soul in relation to the body resembles a moderate reductionism—postulating a relation of constitution without strict identity—his account of the relation between powers and operations, in light of this last text, more closely approximates a strong reductionism taking the form of a relation of identity. As we have seen, such a relation of identity is not confined to the relations between powers and operations within the soul; it also obtains at the interface between soul and body in the case of certain affections of the sensitive soul, such as the passions associated with the sense of touch.

## 6. Conclusion

Dumbleton's treatment of psychological questions reflects a natural philosophical approach to the activities of sensing, willing, and thinking, based on a rigorous analysis of how material qualities—which ultimately account for the structure and dynamics of bodily functions—behave in the physical world. His analysis of psychological questions draws on a hybrid methodology. Indeed, while his analyses incorporate the new methods of mathematical physics typical of the Oxonian tradition, Dumbleton attaches considerable importance to the Aristotelian tradition of applied natural philosophy—that of Aristotle's *De anima*, *De generatione et corruptione*, and *Parva naturalia*, together with their Latin commentaries—and, to some extent, contemporary medical theory.

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quia non sequitur volitio post delectationem sicut tanquam ex causa agente et necessitate ut ex applicatione ignis ad terram sequitur formam ignis produci sed de hac materia alibi tractabitur.”

<sup>44</sup> Dumbleton, *Summa*, pars VIII, cap. 4, f. 95rb.

Rather than engaging in metaphysical debates about the essence of the soul and its powers, Dumbleton concentrates on concrete problems concerning the mechanisms of cognition, and it is from a generally reductionist standpoint that he often arrives at very original positions. Although the *Summa* did not circulate widely, it occupies a significant position at the crossroads of the emerging application of mathematical techniques to natural philosophy and the gradual progress of physiological inquiry at the dawn of the modern period, whose influence is particularly perceptible in the Italian context in the late Middle Ages and Renaissance.

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