

LATER MEDIEVAL PHILOSOPHY OF COGNITIVE PSYCHOLOGY

By the time Jean Buridan gave his lectures on Aristotle's *De anima* at the University of Paris in the first decades of the fourteenth century, there had been a long history of speculation on philosophy of psychology, to the point where cognitive psychology looked much like the natural philosophy (physics) of the day: broad consensus on methodology, on basic principles, and on enough of the field to establish what Thomas Kuhn called the matrix of 'normal science' as the mainstream line of research, with recognized trouble spots calling for further work. In the case of natural philosophy, these trouble spots were places where the inherited Aristotelian framework, derived above all from Aristotle's *Physics* and its associated Arabic commentaries, seemed either mistaken or incomplete; the cases of projectile motion and the (non)existence of the vacuum being particularly challenging. In the case of the philosophy of cognitive psychology, Buridan's main concern, the consensus and its trouble spots are less often seen for what they are: part of the systematic evolution of a field of inquiry, whose outlines I aim to sketch in what follows. The tale I will tell is a blend of historical and systematic developments, mixing causes with reasons, designed to present not only a picture of the debates with which Buridan was faced but also an explanation of their development. Like any broad overview, it suffers unavoidably from oversimplification and compression; its virtue, if any there be, is offering a clear view of the forest rather than the trees. For those who want a closer look at one tree or another, there is a wealth of scholarship, references to which can be gleaned from the detailed studies that follow in this volume. Here the task is instead to get a handle on how philosophers understood cognitive psychology at the beginning of the fourteenth century.

In what follows I'll first describe earlier medieval work on the philosophy of cognitive psychology relevant to the later debates (§1), and then spell out the details of the consensus that was reached in the middle of the thirteenth century, what I call the 'Neo-Aristotelian Synthesis' (§2), analogous to the 'normal science' of natural philosophy. I then turn to five specific trouble spots in which this consensus is threatened: the ontology of psychology (§3), mental architecture (§4), transduction (§5), the object of thought (§6), and intentionality (§7).

1. THE LONG SHADOW OF AUGUSTINE

The dominant influence on the philosophy of psychology in the early medieval period, and arguably for the whole of the Middle Ages, was Augustine. However, the recognition of psychology in the later Middle Ages as an intellectual discipline in its own right – a science – is due not to Augustine, but to the influence of Aristotle’s *De anima* once it became available in Latin translation, much as natural philosophy was deeply indebted to his *Physics*. Its success is more puzzling than that of the *Physics*, though, since the scientific status of psychology in Aristotle is problematic, and several of the problems are highlighted at the very start of the *De anima*: How is psychology a science distinct from biology and from *Physics*? How is psychology a single field of inquiry if there are a plurality of types of soul? If psychology is a branch of natural philosophy, then how can the immaterial human intellect be studied as part of it? No clear answers to these questions were forthcoming, and they remained matters of controversy for the rest of the Middle Ages. Yet, warts and all, in his *De anima* Aristotle managed to offer philosophers (a) a vocabulary and set of technical tools for discussing psychology; (b) a framework of interconnected problems about psychology; and (c) answers to these same problems. In short, Aristotle provided what Augustine did not, namely a viable research program.

For all that, Augustine’s influence on medieval philosophy of psychology was powerful and inescapable. His stature as a Father of the Church and his unquestionable orthodoxy on matters of Christian doctrine gave him a standing and a cachet Aristotle could not have. What is more, only disconnected bits and pieces of Aristotle’s views were available in Latin during the early Middle Ages: a few remarks about understandings at the start of the *De interpretatione*, an obscure report by Boethius that there are three types of soul, and some desultory claims about perception that had been incorporated into the encyclopedists and neoplatonic summaries. Most of Aristotle’s views about psychology were no competition in the early Middle Ages simply because they were almost completely unknown.

Augustine does not owe his influence merely to ignorance about Aristotle, however. The history of psychology was shaped by the fact that Augustine was a philosopher of genius whose sensibilities were especially tuned to psychological matters. Although he never wrote a treatise expressly devoted to the philosophy of psychology, Augustine’s (un)systematic remarks on the subject – particularly in his works *The Teacher*, *Confessions* 10, and *The Trinity* 10–15 (the latter of which was required reading for theologians throughout the Middle Ages) – put a series of topics permanently on its agenda, accompanied by Augustine’s own proposals about how to best address them, topics

that Aristotle often either neglected or downplayed in his own work; they were the subject of lively philosophical debate in the later Middle Ages and came to be thought of as distinctly ‘augustinian’ worries. This is not entirely accurate. Augustine has much to say, for instance, in *The Trinity* about the nature of sense-perception, including details about its physiological mechanics. But when later philosophers became acquainted with the *De anima*, they usually preferred Aristotle’s treatment of these issues, integrated as it was with the rest of his approach to psychology, and Augustine’s discussion was silently passed over. There is much more in common between Aristotle and Augustine than might appear from focusing on their differences might lead one to believe.

The topics Augustine bequeathed to later medieval cognitive psychology are as follows: (i) learning and comprehension, or more generally what understanding as an active process might be, which Augustine tried to resolve with his theory of illumination; (ii) the mechanisms and phenomenology of memory, including storage, recollection, and the general nature of time-consciousness; (iii) attention, concentration, and mental ‘focus’ at both the perceptual and intellectual levels; (iv) (self)-consciousness; (v) the ontological status of the psyche/soul, in particular its possible postmortem survival, a concern mentioned obscurely in passing by Aristotle but dwelt on at great length by Augustine and others. Since Aristotle said relatively little about (i)–(v), philosophers could address these topics without having to come into conflict with Aristotle, and treat their results as extensions of Aristotle’s position – though, of course, there were philosophers who developed their views on one or another of these topics in such a way as to develop theories that were inconsistent with Aristotle. (These philosophers are usually lumped together under the banner of ‘Augustinians’.) Whether one thought that Augustine’s proposals for how to address (i)–(v) should be accepted or not, it is clear that they are central to cognitive psychology, and they lent a distinct flavor to later investigation.

Apart from Augustine, only two other sources prior to the thirteenth century are worth mentioning. First, the medical tradition had much to say about the physiology of perception and at least some of the large-scale features of neuroanatomy that underlie cognition. Like Augustine, later philosophers tried to keep abreast of the developments in medical knowledge (*e.g.* in analyzing the function and operation of the nerves) and to take them into account when engaged in philosophical psychology, particularly with regard to sense-perception, which was usually regarded as a physiological process.

Second, Peter Abelard in the twelfth century offered an extended critique of the Aristotelian thesis that the cognition of φ is a matter of having

the form-of- φ in one's cognitive apparatus, either directly or through some sort of intermediary representation (Abelard likely did not recognize Aristotle as the source of the view). In its place he proposed a theory of thinking as essentially linguistic in structure. While Augustine had an account of developed conceptual thought as the "inner word," Abelard adopts principles of compositionality and logical scope to explain thought, being the first to treat the mind as a symbolic processing engine. Yet Abelard's views, presented in his *Treatise on Understandings* and in his commentaries on the few Aristotelian texts available to him, seem to have little by way of precedent and even less influence, not taken up by later thinkers even in his own time as far as we know. The later rebirth of theories of mental language at the turn of the fourteenth century seems wholly original and not indebted to Abelard's pioneering work.

Speculation on cognitive psychology in the early Middle Ages, then, was broadly augustinian and to a large extent simply Augustine, who cast a long shadow over his successors. It took nothing less than a general intellectual revolution for later philosophers to begin thinking systematically about the fundamental principles of cognitive psychology. That revolution, of course, was sparked by the recovery, translation, and dissemination of Aristotle, a project that took roughly a century from its beginnings around the middle of the twelfth century, and requiring the birth of a new social institution for the transmission of knowledge: the university.

2. THE NEO-ARISTOTELIAN SYNTHESIS

By the middle of the thirteenth century, Aristotle's *De anima* had become an accepted part of the curriculum in the Faculty of Arts at Paris and, to a lesser extent, at Oxford: required reading at the former, one way of fulfilling science requirements at the latter. Along the way the *De anima* was translated twice, first by James of Venice (ca. 1150) and thereafter by Michael Scotus (ca. 1220), before William of Moerbeke produced a definitive Latin version (ca. 1265). Its journey to academic respectability was not smooth; the *De anima* was condemned several times by the authorities in the first half of the thirteenth century for its supposed non-Christian views. In spite of such opposition, with the help of commentators both Greek (Themistius) and Arabic (Averroës) as well as a wary eye to orthodoxy and to Augustine, philosophers in middle of the thirteenth century put together a systematic account of psychology based on the *De anima* – the 'neo-Aristotelian synthesis' that became the mainstream doctrine.

The fundamental principle of the neo-Aristotelian synthesis is that psychological phenomena are to be explained in terms of internal psychological

mechanisms that bring them about: roughly speaking, that psychological explanations should be couched in terms of the interaction of (perhaps only postulated) psychological mechanisms. In the case of cognition, these mechanisms are for the most part subpersonal and semi-autonomous, that is, they do not involve the whole person as agent but only some psychological mechanism, and further that these mechanisms have a degree of independence from one another in their operation. Introspectible psychological phenomena are the product of the interaction of such inner mechanisms.

These (perhaps postulated) psychological mechanisms, each a locus of activity and in that sense quasi-agential, are causally interconnected; typically one causes or triggers the action of another, where the causation in question is analyzed in terms of potency and act. In general, their existence and nature is deduced from the functions they discharge. Typically, these semi-autonomous mental modules – usually called ‘faculties’ – transfer (or ‘transduce’) information from one relatively isolated part or mechanism to another. The process of transference was understood as the ‘transmission of form’, on the grounds that to count as information at all what is transferred must have some structure; when the process of transmission is information-preserving, it was understood as an instance of ‘the same form’ in each faculty. The vehicle by which the form is transferred is itself a mental representation (species) that mediates among the several faculties of the mind.

To summarize: According to the neo-Aristotelian synthesis, the best explanation of cognitive psychological phenomena is given by functionally-defined subpersonal mechanisms operating in relative independence on representations. At this level of generality, their project closely resembles contemporary cognitive science. Details bear out the similarity at the ‘base level’ of sense-perception (sensitive cognition), the analysis of which is integrated in a broader causal account.

Consider what happens when Socrates sees the horse Bucephalus. The horse affects Socrates’s sense-organs by having a causal impact on the intervening medium, in a way spelled out in the case of vision not by psychology but rather by the medieval science of optics (*scientia perspectiua*): in normal circumstances the light reflected by Bucephalus affects sequentially the layers of air between it and Socrates, where the transmitted information in each layer of the intervening medium causally reproduces itself in the next layer – the so-called *species in medio* (“representation-in-the-medium”) doctrine. However the optical story may go, the important point is that the relevant visual information is transmitted to Socrates, such that his affected sense-organs (in this case his eyes) are put into one of their possible determinate configurations δ_i . Each of Socrates’s sense-organs is correlated with a sense-faculty in the ex-

pected way, so that the eye is the sense-organ for the faculty of vision, the ear for the faculty of hearing, and so on; in general, a sense-faculty is the form or actuality of the associated material sense-organ, as a particular instance of the form-matter relation between soul and body. The sense-organ is part of a living body, which means that it has the appropriate sort of receptivity to the objects it senses. In particular, the sense-organ responds differentially to a range of causal input, such that it can be put into a fixed range of determinate configurations $\delta_1 \dots \delta_n$ depending on the distal stimulus, where being put into the state δ_i – that is, when the material sense-organ actualizes its capacity to be in δ_i – realizes the sense-faculty's ability δ_i to have a sense-experience of the appropriate sort. Less abstractly, what it is for Socrates to see Bucephalus is for his eyes to have a distinctive pattern of rod and cone firings, integrated for binocular vision, that occurs when he sees Bucephalus rather than any other horse, or at least rather than any other kind of animal, and which is characteristic of horses rather than of other things; the rod-and-cone-firing pattern is in all the relevant respects the visual experience of Bucephalus.

Hence the analysis of sense-perception begins with an exact understanding of the form-matter relation of the sense-faculty and its associated sense-organ, treating this relation as a variety of the act-potency relation in such a way that the object and the sensing of it are 'formally identical'. Take Bucephalus again. What makes him a horse and not, say, a marmoset, is the presence of the form of horseness in him. This form is physically transmitted through the intervening medium to affect Socrates's eyes, putting them in proper 'Bucephalus'-configuration, which captures exactly whatever can be captured about Bucephalus as an individual. The causal action of Bucephalus on Socrates is necessary, because it is true in general that something is reduced from potency to act only by an agent cause. That is to say, whenever there is some actualizing process going on, there is an agent which causes the occurrence of that process. In sensitive cognition, the sensed object is therefore the agent cause of the determinate actualization of the potencies of the sense-faculty. External objects are actually sensible; in standard circumstances, they causally bring it about that they are actually sensed.

So much holds for each of the five external senses, *mutatis mutandis*. The distinction of external and internal senses seems required by the evident facts of experience, but the internal sense faculties (however many there may be) are given the same kind of potency-act-cause analysis.

The base level of sensitive cognition, as sketched above, was taken to provide the tools to be used in the analysis of intellective cognition, held to operate in an analogous fashion: subpersonal and semi-autonomous cognitive faculties connected by potency-act-cause relations.

The ‘analogue level’ of intellectual cognition (understanding) differs in two main ways from sensitive cognition. First, the intellectual soul is immaterial and therefore discharges its operation without making use of an associated localized organ; the corresponding analysis of its behavior cannot rely upon physiology the way the analysis of sense-perception can. Second, an agent cause must be postulated for intellectual cognition, the operation of which is analogous to the causal activity of the external object in sensitive cognition, on the grounds that the object has spent its causal powers in bringing about sensory cognition; this cause is called the ‘agent intellect’, in contradistinction to the ‘possible’ (less commonly ‘material’) intellect, and it is the causal agent directly responsible for occurrent thought, which may take place through a sequence of actions; according to the neo-Aristotelian synthesis, the agent intellect operates on the representation involved in sensitive cognition and (thereby?) causally affects the possible intellect. Roughly, when Socrates encounters Bucephalus, his agent intellect repurposes the information found in the sensible representation to prepare it for the higher-level activity of thought, which it then causally impresses on the possible intellect, thereby actualizing the capacity of the possible intellect to think whatever the thought associated with Bucephalus may be. These intellectual mechanisms are postulated; unlike the case of sense-perception, we have no direct access to the elements involved in intellectual cognition.

There is much to admire in the neo-Aristotelian synthesis. An economical set of principles, sketched above, yields a theoretically rich articulated structure, one that can plausibly lay claim to being a complete theory of cognitive psychological phenomena. Its explanatory power derives in part from the complex structure it hypothesizes to underpin cognition: the distinction of the various faculties, the uniformity of principles which govern their interaction, the proposal that conscious psychological phenomena are the result of complex activities – all this gives some explanatory traction to the neo-Aristotelian approach to psychology.

Yet there is much to criticize and revise as well. In some cases the controversy was so intense that some philosophers came to reject the neo-Aristotelian synthesis altogether; others tried to modify it; some to defend it. These controversies, seen against the backdrop of the neo-Aristotelian synthesis, provide the context for Jean Buridan’s cognitive psychology.

3. THE ONTOLOGY OF PSYCHOLOGY

According to the neo-Aristotelian synthesis, the life of an animal, at least of a complex animal, is a holistic feature of the animal. It is not identifiable with some matter or some material part belonging to the animal – or, put in

medieval terms, the sensitive soul is not a body. For the life of a complex organic system consists at least partly in the appropriate interaction of its constituent organic subsystems, and the proper functional relation among the parts is not itself a part, thus a fortiori not a material part. Rather, the sensitive soul is (weakly) supervenient on the material constituents that make up the animal's body, and wholly dependent upon them. But this does not give the sensitive soul any independent ontological weight, for such things can be 'reduced' or 'eliminated' in favor of the arrangement and disposition of the material parts upon which they supervene. What is true for the sensitive soul as a whole also holds for the activity of sensing. Sense-perception is consequent upon the physiological changes in the sense-organ without being itself a material phenomenon. The sense-organ is the proximate subject of the sensing, as noted, but the act of sensing is properly received in the ensouled composite as a whole: we do not say that the eyes see, but rather that Socrates sees. Sensing is therefore an activity that can take place only through a bodily organ, much as dancing requires a dancer.

However, the human mind (the intellective soul) is a form that does have some kind of ontological standing independent of its combination with matter, a status with sufficient ontological independence to allow it to be the locus of emergent nonmaterial properties, such as thinking and willing, which do not require a bodily organ for their existence (and perhaps not a body at all) – a medieval version of property-dualism. Psychology thus became entangled with the metaphysics of hylomorphic compounds, that is, of form/matter composites. The context in which debates over the metaphysical nature of such hylomorphic compounds took place had to do with whether a substance had only a single substantial form (the 'unitarian' position) or more than one such form (the 'pluralist' position); the central point at issue was the unity of the form/matter composite.

John Duns Scotus emerges as an advocate of a middle-of-the-road position. In the backwash of the extensive debates between Henry of Ghent and Godfrey of Fontaines over the unicity or plurality of substantial form in human beings, Scotus argued that a composite can be made up of a series of other entities as long as they are 'ordered' to a single form. The existences of the constituent parts of the composite are not simply added or aggregated; they have instead an essential order to one another, and overall an essential order to the 'topmost' substantial form that gives existence to the whole composite, as Scotus insists. In this way the whole composite can be divided into act and potency, namely the final 'completive' (*completiva*) form and the remainder of the composite. And as with existences, so with the beings themselves: the unity of the composite is to be found in the union of its constituent

elements through an internal essential order. The beings that are the matter and the form are distinct, but they are essentially ordered to one another. The upshot is that, for Scotus, the unity of the composite is preserved by the correct ordering obtaining among its component entities, which allows for essential and existential (in)dependence. In the particular case of the human mind/soul, it is not essentially dependent upon the composite of which it is a constituent part; whether it depends on the composite for its existence is a matter that has to be left to faith – natural reason cannot show that it continues in existence after death.

Some philosophers (the ‘philosophical materialists’) found Scotus’s conclusion congenial, but his solution too dependent on his idiosyncratic metaphysics. They held instead that the immateriality and substantiality of the intellective soul could not be proved; some went so far as to hold that natural reason dictates the conclusion that the intellective soul is as material as the sensitive soul, and that the opposite is held only through faith, in the teeth of reason. This position was historically associated with Alexander of Aphrodisias, as reported by Averroës, who is said to have thought that thinking is the highest perfection that can be ‘drawn forth’ from matter. John of Jandun and William of Ockham subscribed to this philosophical materialism, holding that the intellective soul should be understood exactly like the sensitive soul, or at least it should be so understood were faith not to dictate otherwise.

4. MENTAL ARCHITECTURE

The subpersonal functional mechanisms organized into psychological faculties interact with one another causally and with a degree of relative independence; the explanatory traction they provide is the foundation of the neo-Aristotelian synthesis. Thomas Aquinas takes the division of psychological faculties specified by the cross-cutting distinctions sensitive/intellective and cognitive/affective to be given by the primary object of a power or set of powers. That is, he takes the difference among faculties to be intensional, based on what different psychological powers are directed towards. He underwrites this intensional difference between psychological faculties with an extensional (‘real’) difference between (a) the soul and its faculties, and (b) between one faculty and another. This allows him to characterize each faculty as an independent subpersonal causal locus, defined functionally and linked to other faculties by an input-output stream, while maintaining that these really distinct faculties are all ultimately grounded in the same subject which is really distinct from them. The organization of mental life reflects the ontology of the mental.

Yet Aquinas is distressingly vague about the metaphysical status of psy-

chological faculties: are they accidents, properties, objects in their own right? While he officially follows Albert the Great in speaking of them as ‘properties’, his arguments encourage thinking of them as accidents, and he leaves the details and implications of their real distinctness unexplored. Some later philosophers tried to spell out the details Aquinas left vague, with varying degrees of success.

Others, however, took a different approach to the issue, motivated by the desire to clarify the metaphysics underlying psychological explanation. Henry of Ghent, for example, argued that psychological faculties are real relational aspects of the soul – that is, ways in which the soul could be related to itself. On that score different psychological faculties would be distinct according to his ‘intentional distinction’: an intensional distinction that need not be underwritten by real distinctness. Even further along the same lines, Scotus proposed that there is only a formal distinction in *(a)* and *(b)*. On his reading, psychological faculties, or at least major ones, are really the same as the soul and hence as one another, but they have different natures and hence elicit formally different kinds of acts (thinking, sensing, willing, and feeling). This is not just a matter of how we think about such faculties; they are genuinely different in reality. Scotus proposed that all of our psychological faculties, while formally distinct from one another, are combined together in something (the soul) which forges a unity out of them, which he dubbed “unitive containment.” Critics were quick to point out that this names rather than solves the problem, which requires more than mere assertion that a real difference can be maintained by a formal or intentional distinction.

Perhaps in response to such criticism, William of Ockham rejects the claim that an intensional difference of itself can underwrite an extensional difference. He analyzes and argues at length against the positions taken by Aquinas, Henry of Ghent, and Scotus. For his own part, Ockham articulates a stringent condition for postulating a real distinction and argues that psychological acts, even of thinking and willing, fail to satisfy it. Hence, with a flourish of his razor, he concludes that there is only a conceptual distinction at work in *(a)* and *(b)*: the difference between psychological faculties just a matter of how we look at them, no more deeply rooted in the world than is the difference between concave and convex. (His view has the consequence that there is no real difference between cognitive and affective psychology.) Properly speaking, thinking something and willing it (say) are just two ways that one and the same thing, the soul, relates itself to its object.

Ockham’s radical rejection of the mainstream view seems to have had some currency at Oxford in the first decades of the fourteenth century, numbering among its adherents Robert Holcot and William Crathorn. Other

philosophers thought that Ockham's view failed to explain what called for explanation, namely why and how the soul relates itself to its object in such strikingly disparate ways; it is true enough as a fact of experience that it does so, and, in the eyes of many, these ways are different not because we think so but because they really are different – which lands us back where the debate began.

5. TRANSDUCTION

There are two distinct levels of cognition, namely the sensitive and the intellective; their distinctness in human beings parallels the fact that there are beings with only sensitive cognition (non-human animals) as well as beings with only intellective cognition (angels). So much is common intellectual property. For sense-perception to occur, it seems that there must be representations in sensitive cognition which provide information about whatever is perceived in sense-experience. How is such information made accessible to and become present in the intellect? Whatever accomplishes the task is a transducer: a mechanism that translates information from one kind of domain to another, in this case from the nonlinguistic and nonconceptual realm of sense-perception to the conceptual realm of the intellect. According to the neo-Aristotelian synthesis, the transfer is effected through the agent cause in the intellect, which is said to “operate” on sensory representations to bring about an occurrent act of thought. Yet while the causal role of the agent cause (usually identified as the Agent Intellect) is clear, how it brings about transduction is not. Unlike the preceding difficulties with intentionality, the neo-Aristotelian synthesis does not clearly adopt any particular proposal about transduction; the result is that there were competing efforts to give an account of transduction compatible with the overall synthesis.

There were two main contenders. First, Aquinas and other philosophers endorsed a version of traditional concept abstractivism, in which the agent intellect performs two distinct and sequential functions: (a) preparing the representation in the sensitive faculty so that it becomes intelligible, and then (b) impressing the intelligible representation on the possible intellect, reducing it from potency to act, so that an actual thought of the object occurs. The preparation of the sensible species – the representation in the sensitive faculty – mentioned in (a) was accomplished by an ‘abstraction’ of the relevant information it contains. Often this is a matter of stripping away particular, or perhaps only particularizing, data: from the sensible representation of Bucephalus all the features that make him the individual horse he is removed, so that a general representation of horse-information is all that remains. Even a philosopher as different from Aquinas as Scotus agrees that

(a) may involve abstraction in the sense that the information in the sensible representation is made general along the lines sketched here; he differs only in thinking that it need not, for he allows the intellect to have cognition of singulars (see §6 below). Aquinas and Scotus further agree that individuating conditions are not formal differences, that is, that the individual does not differ from the species to which it belongs by any formal differentiating feature. In the psychological domain, this means that the representation is at least of the same kind in the sensitive and the intellective cognitive faculties, which allows for some degree of sameness between the intellective cognition and the external particular object it is directed towards.

While a popular way to fill out the neo-Aristotelian synthesis, concept abstractivism was not always adopted, and some of its critics, like Peter John Olivi, made sharp and telling points against it. Suppose that abstraction works more or less as described above. How does the agent intellect ‘know’ what information to extract from the sensible representation, or equivalently what data to strip away? If we are to avoid a homunculus-explanation, it must be that the abstract representation as prepared for the intellect is already contained in the sensible representation, so that the agent intellect can act as a mere blind filter: roughly speaking, that sense-experience presents objects as belonging to kinds, so that Bucephalus is sensed as an individual horse. But if the sensible species represents its object as ‘this φ ’, where ‘this’ picks out object’s individuating conditions (signate matter, haecceity, spatio-temporal location, or whatever does the job) and the ‘ φ ’ the object’s kind, then at the level of sensible cognition, which humans share with other animals, conceptual resources must be available, since objects are sensed as belonging to kinds – which requires non-rational animals to have a grasp of kinds, which is unacceptable since such universals were thought to be the province of reason alone. In short, abstraction seems to blur if not obliterate the difference between sensitive and intellective cognition, perhaps threatening the distinction between human beings and non-rational animals.

The second main contender for an explanation of the activity of the agent cause in the intellect was to try to explain transduction as a kind of Augustinian illumination rather than some sort of abstraction. Philosophers who took this approach include thinkers as varied as Matthew of Aquasparta, Bonaventure, and Henry of Ghent. The common core thread uniting their theories is the claim that the elements involved in understanding are not present in the sensible species, however inchoate, but instead are contributed by the transductive mechanism itself. Transduction is accomplished when the agent intellect is guided by the Divine Ideas, which are the ideal patterns or archetypes in God’s mind – they are exemplars, or exemplary forms, of

mundane objects. The guiding metaphor of illumination is understood as a matter of taking the sensible representation and seeing it “in a new light,” as presenting further or new information; whatever classification (here: falling under a Divine Idea) is the work of the intellect rather than the senses. The sensible species is like the famous ‘duck-rabbit’ drawing: the illustration is what it is, but appears as a duck to the senses and as a rabbit to the intellect. Hence theories of illumination do not presuppose conceptual abilities in the sensitive soul.

Yet here too there was no shortage of criticism. To many philosophers illumination seemed to be no more than a homunculus-explanation, with God acting as the homunculus: the sensible species of Bucephalus has to be illuminated in the right way, so that it presents a horse to the intellect (rather than, say, a striking case of a large oddly-shaped dog); it seems as though at some point conscious classification has to take place to guarantee that illumination does the job correctly, prior to any conscious thought on our part. Worse yet, there is no account here of the transductive mechanism. To say that Divine Ideas shed light on a sensible species, or that God illuminates our minds when needed, does not provide a mechanism but rather a black box.

In the face of the difficulties facing both attempts to provide a transductive mechanism, some philosophers simply dispensed with it. Ockham notably declares that the presence of the relevant cognitive acts in the sensitive and in the intellective soul follow merely from a ‘sufficient’ proximate agent: in the presence of Bucephalus, the sensitive soul is designed to have a sense-perception of a horse and the intellect a thought of a horse. Ockham eliminates the agent intellect as a separate intellective faculty, claiming instead that the agent and possible intellects are really one and only distinct in reason. With the elimination of the agent intellect as the transducer, there was no need to retain the apparatus of cognitive representations, either, and Ockham accordingly holds that the various functions that were carried out by these representations in the neo-Aristotelian synthesis can be fulfilled by various psychological dispositions. According to him, the mind is a black box predisposed to ideate in determinate ways in the presence of different kinds of objects, without any additional transductive mechanism required: illumination naturalized.

The drawback to Ockham’s radical view is that it gives up any attempt to explain why we sense and think what we do, relying instead on the brute fact that it happens, and trusting that it will always happen by a pre-established harmony. In short, it gives up on the goal of scientific psychology, namely finding explanations for psychological phenomena. Here again there was much debate but no consensus on a solution.

6. THE OBJECT OF THOUGHT

As noted in the previous section, Aquinas endorses concept abstractivism. William de la Mare immediately objected to his view, and by extension to his version of the neo-Aristotelian synthesis, that it would be unable to accommodate singular thought (not to be confused with *de re* thought). The line of reasoning sketched by de la Mare is straightforward. Aquinas, among others, holds that the agent intellect ‘abstracts’ an intellectual representation by stripping off any individuating features from the sensitive representation. If so, then thinking always takes place with respect to something non-individual; “sensing is of particulars and thinking of universals” (as Aquinas approvingly quotes Aristotle). Yet we do think about John and about Paul, however this may occur. But the abstractivist version of the neo-Aristotelian synthesis has no way to explain how singular thought could take place. Since it evidently does take place, the problem is to explain how it is possible on the abstractivist view.

The response on Aquinas’s behalf, offered by Richard Knapwell and others, was to point to Aquinas’s remarks about “turning to the phantasm.” But even the defenders of Aquinas had to admit that this was not an answer but at best a suggestion of where an answer might be found. Those who tried to patch up Aquinas’s version of the neo-Aristotelian synthesis with theories of indirect cognition had to offer some mechanism by which this could happen, and there was no consensus on what this could be.

Worse yet, the same problem in much the same terms could be posed to illumination. To bring a sensible representation (be it the phantasm or a sensible species) under a Divine Idea, so that its kind is apparent, seems equally to operate at the level of universals rather than individuals. Henry of Ghent argued that since the sensible representation is not transformed but merely viewed “in a new light,” it need not be universalized, and hence singular thought is possible. However, he too failed to provide any explanation of how and when this takes place, and since he also argued that the agent intellect produces a ‘de-individualized’ representation, his bare claim that singular thought is possible did not win many adherents. Some philosophers drew instead the moral that the neo-Aristotelian synthesis itself should be rejected; James of Viterbo and Peter John Olivi, for instance, argued for something more like an ‘augustinian’ account of cognition, including illumination.

Other philosophers were less tempted by this strategy than they were by the prospect of redesigning, or perhaps supplementing, some or all of the neo-Aristotelian synthesis so as to be able to deal with the problem. The most noteworthy proposal was offered by Duns Scotus, who not only recognized

the problem of singular cognition he distinguished it correctly from *de re* thought. Over the course of his career, Scotus – perhaps influenced by Vital du Four – pioneered a distinction between intuitive cognition and abstractive cognition, the former specifically meant to allow for singular cognition. (There is reason to think Scotus had de la Mare’s criticisms of Aquinas specifically in mind.) Intuitive cognition is an act that grasps a present existing individual as present and existing; abstractive cognition is an act that prescind from the presence or existence of its object. Hence abstractive cognition may, and intuitive cognition must, be directed at individuals. When Socrates encounters Bucephalus, he has an intuitive sensible cognition of him, namely his ordinary perception of Bucephalus. (An abstractive sensible cognition of Bucephalus might be Socrates’s memory of the encounter.) He may also have an intuitive intellectual cognition of Bucephalus, which is to say that Socrates may think of Bucephalus as present and existent.

Of course, to hold this line Scotus has to reject the view that the difference between sensing and thinking reflects the difference between particulars and universals. And so he does: since sense is capable of grasping the particular, so too intellect must be capable of doing the same. Yet the price is high; Scotus has to introduce a new psychological faculty or ability (intuition) to the neo-Aristotelian synthesis, and, worse still, to make it central to his account of cognition. Yet the payoff was generally taken to be worth the cost. In fact, Scotus’s technical explanation of intuitive and abstractive cognition (in terms of Aristotle’s theory of relations) was jettisoned by all but a few, and freed from its technical details the doctrine of intuitive and abstractive cognition became widely entrenched as a supplement to the neo-Aristotelian synthesis.

But not all philosophers thought so. William of Ockham identified what he took to be a fatal flaw in Scotus’s account. According to Ockham, Scotus has made the same mistake as Aquinas: he hasn’t specified any mechanism to explain how intellectual intuitive cognition is possible. Rather than explaining how singular thought happens, Scotus just asserts that it happens. Worse yet, Scotus seems to have mixed together psychological phenomena explicable by describing a quasi-causal mechanism that brings them about with psychological events that seem to just happen. In contemporary terms, Scotus has proposed an uneasy hybrid of representationalism with direct realism – strange bedfellows indeed!

Defenders of Scotus pointed out that Scotus was careful to say that the agent intellect need not strip away individuating data when it transduces the sensible representation in preparing it to be impressed on the possible intellect, so there is a mechanism available to explain how intuitive intellectual cognition is possible. Yet since the operation of the agent intellect is supposed

to be purely automatic, defenders of Scotus still had to explain when and why it sometimes led to abstractive and sometimes to intuitive cognition.

Ockham draws a surprising moral. From Scotus's omission (or at least unclarity) regarding a psychological mechanism underpinning the doctrine of intuitive and abstractive cognition, Ockham concludes that none is really needed – that the project of explaining psychological phenomena by the causal interaction of subpersonal mechanisms is misguided. Hence he rejects such appeals. On his view, a sensory intuitive cognition occurs when in the presence of an object, and, together with the object, causes an intellectual intuitive cognition of that same object; after repeated exposure, the mind is caused to have an abstractive general concept of that kind of object. Along the way, habits are created, which account for overt acts of memory as well the dispositional abilities that make up the concept of the object. Thus in the presence of Bucephalus, Socrates has an intuitive cognition of Bucephalus, which in its turn causes an abstractive cognition of Bucephalus. Nothing more needs to be said about how this happens, other than to point to the proximity of Socrates to Bucephalus. To the objection that this requires a material agent (Bucephalus) to cause an effect in an immaterial patient (Socrates's intellect) – a suggestion other philosophers rejected; Durand of St.-Pourçain calls it absurd – Ockham simply asserts that it is indeed possible, and leaves it at that. What is more, since there is no need to postulate subpersonal psychological mechanisms, there is equally no need to postulate any intermediary representations; Ockham therefore rejects both sensible and intelligible species, on the grounds that any job they might have performed can be accounted for adequately by postulating complexes of competencies (*habitus*). Thus Ockham dispenses with the remnants of the neo-Aristotelian synthesis, endorsing instead a direct realism that supports a linguistic account of the mind (Mental Language) buttressed by acquired competencies.

7. INTENTIONALITY

Intentionality posed as much a puzzle to philosophers of the Middle Ages as it does today. In general, the neo-Aristotelian synthesis explains intentionality as a matter of both conformality and resemblance: a cognitive episode is 'about' something if it has or shares the same form as what it is about (conformality), that form making the episode 'like' its object (resemblance). This analysis applies to both sensitive and intellectual cognition. The pattern of rod-and-cone-firing in Socrates's eyes contains horse-information and, despite not looking at all like a horse, is 'like' a horse in that it is the determinate actualization of the eyes in the presence of horses; were we to know all the physiological details, we could construct an isomorphism between states of

the eye and distinct (kinds of) animal. Furthermore, the fact of resemblance can be used to account for mental imagery, how it is that we imagine or think about a horse by means of what seems to be likeness of the horse in a pictorial sense. This is how “the knower becomes the known” and the mind its object; so Aquinas – intentionality is therefore a matter of possessing, in the proper fashion, the appropriate representation in the appropriate faculty.

This analysis of intentionality came under attack almost immediately. The main charge was that it did not succeed in explaining anything. Since the form does not inform the faculty so as to make it into the very same thing as that of which it is the form – the form of the horse in the eye does not make the eye into a horse, and the case is worse for thinking – how then does the form make the faculty into a psychological event about the thing instead? A related issue is why the state of the eye represents the horse but not conversely, and indeed why other representations of horses (say in paintings) are not psychological events. The natural reply is to claim that there is something distinctive about the medium in the case of psychological events: the canvas of the painting is the wrong sort of substrate for perception, whereas the eyes are the right sort. Yet this answer failed to satisfy many critics. They objected that makes representation not a matter of conformality or resemblance but rather to require the special (and unexplained) properties of the medium in which the representation occurs. In brief, that makes soul-stuff magical. A different reply to the charge that the analysis of intentionality doesn’t explain anything was to locate the special property of psychological intentionality in the mode of inherence of the form in its medium. The form of the horse normally makes matter into a horse, but it may instead inhere in the sensitive or intellectual soul, though in an immaterial way: the form of horse makes matter into a horse but makes soul into a cognition-of-a-horse. This different reply was widely accepted. Yet it too did not escape criticism on much the same grounds. If intentionality is the product of a form having a special mode of inherence in a psychological faculty, and we have already ruled out appeal to the faculty on its own as an explanation, then we need to know what kind of a mode of inherence generates psychological intentionality. And, again, no answer is forthcoming.

These objections to the simple analysis of intentionality found in the neo-Aristotelian synthesis were powerfully argued by Henry of Ghent, among others, and it was his articulation of these criticisms that led John Duns Scotus to try to rescue the analysis by introducing a revision to the basic account. His proposal is noteworthy because it seems to be the first clear instance of the notion of ‘mental content’, that is, an attempt to distinguish the form of the occurrent thought from the form ‘contained’ by the occurrent thought.

Scotus held that one form had the job of informing the soul and thereby bringing about a psychological event, and that a distinct form – the form shared with the external object – is somehow present in the informing form, explaining what the thought is a thought about. The contained form has a real but ‘diminished’ mode of being, unlike its existence in an external object. It does not exist subjectively in the soul, which is to say that it does not inhere in the soul directly as its subject; it rather is present only objectively, providing the act of thinking with its object. The horse is “present” in the mind through the intelligible species, a representation geared for intellectual cognition, as a kind of mental content distinct from whatever explains the occurrence of an act of thought. Scotus thought we could give some explanatory power back to conformality and resemblance at the cost of doubling the number of forms involved in the analysis.

Now Scotus formulated and defended his view in the context of a debate over whether cognitive intentionality is best explained by representations (or operations on representations), that is to say, whether there is a philosophical need to postulate the existence of an intelligible species, a special representation to explain higher-level cognition. While Scotus’s distinction between the act of thinking and the content of thought was widely adopted, its underlying *metaPhysics*, and in particular its murky ontology (what kind of ontological status is “diminished being”?), prevented his proposed revision to the neo-Aristotelian synthesis from general acceptance. In addition, some philosophers argued that by introducing mental content Scotus only relocated the problems with intentionality to the form objectively existing in the mind.

The failure to provide any clear explanation of intentionality, either according to the standard account of the neo-Aristotelian synthesis or in its revision by Scotus, led some philosophers to more radical proposals, abandoning conformality as a way to explain intentionality. Durand of St.-Pourçain, and later Buridan’s near-contemporary and fellow nominalist William of Ockham, each came to give up conformality and resemblance and instead proposed to explain the intentionality of a cognitive act by means of its relation to the cause of the act, an analysis used for both sensitive and intellectual cognition. (The trajectory of Ockham’s development is particularly interesting: he began by adopting something like a version of Scotus’s mental-content theory with his claim that the object of thought is a *fictum*, and through debates with Walter Chatton and John of Reading came to abandon the revisionary approach to the standard analysis.) By appealing to causal covariance we can explain cognitive intentionality: only in the presence of horses do we seem to have horse-perceptions, after all, and the point can be generalized to thought. Since we already countenance causal relations, we might as well use them to

explain intentionality, along the way dropping most of the optical and physiological accounts of representation. Arguably this will lead to externalism about mental content, and perhaps to rejecting the broader attempt by the neo-Aristotelian synthesis to get explanatory purchase on psychological phenomena by postulating internal mechanisms.

CONCLUSION

It may be hard to see the forest for all the trees, so let me summarize. After the neo-Aristotelian synthesis was forged around the middle of the thirteenth century, it was subjected to intense scrutiny and criticism on several counts; nearly every tenet was rejected by one philosopher or another, and different philosophers tinkered with different parts, sometimes inventing a new defense, sometimes adding on a new part. The trouble spots canvassed above are still with us today: the metaphysical basis for psychological states, cognitive organization, transduction, singular thought, and intentionality. In each case there were several competing solutions (or approaches to solutions) that were actively debated; the virtues and the vices of the neo-Aristotelian synthesis were being minutely scrutinized. Yet even where there seems to be a clear trajectory of development, positions were often maintained and defended, in spite of criticisms that seemed to other philosophers to be definitive. This was the philosophical context in which Jean Buridan gave his lectures on the *De anima*.

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FURTHER READING

There is a wealth of scholarship on medieval philosophy in all languages, but the following suggestions are confined to recent works in English that help guide the reader. There are good general discussions of many topics in medieval cognitive psychology in the online *Stanford Encyclopedia of Philosophy* (<http://plato.stanford.edu>) as well as in the revised edition of *The Cambridge History of Medieval Philosophy* (ed. Pasnau [2014]) and in the *Encyclopedia of Medieval Philosophy* (ed. Lagerlund [2011]). The Cambridge Companion series has individual volumes on Augustine, Abelard, Aquinas, Scotus, and Ockham, each of which has some treatment of issues in the philosophy of mind. Details about more specialized works that cover material treated in this Introduction follow.

For (§1): The standard study of Augustine's views about cognitive psychology is O'Daly [1987], with particular attention paid to his theory of 'active' perception in Silva [2014]. There is no systematic study of Augustine's influence on the philosophy of mind in the later Middle Ages, but there are many specialized studies, such as Cross [2012], which deal with Augustine's long shadow. For the twelfth century, King [2007](b) and Panaccio [2010] deal with Abelard's theory of Mental Language and more broadly with his account of thinking.

For (§2): The initial formation of the neo-Aristotelian synthesis in cognitive psychology is partly covered in Bieniak [2010]. Historical surveys are to be found in Tachau [1988] and Pasnau [1997](a). There are several extended studies of the views of individual philosophers, most notably Henry of Ghent in Goehring [2006], John Duns Scotus in Cross [2015], and William of Ockham in Panaccio [2004], each of which may be consulted as regards the more particular problems the synthesis faced. The details of the neo-Aristotelian synthesis in cognitive psychology can be found in almost any of the general reference works listed above. Some dissenters from the mainstream are discussed in Pasnau [1997](b) and Brower-Tolland [2013] (Olivi) and in Adriaenssen [2014] (Olivi and Auriol).

For (§3): Problems in the ontology of psychology are surveyed in King [2012]. Pluta [2007] deals with particular questions about emergence and materialism; Klima [2009](b) takes up the issue of the immateriality of the human soul. Pasnau [2008] concentrates on the relation between mind and soul, while Pasnau [2012] is a more general treatment of the relation of psychology tohylomorphism.

For (§4): Mental architecture is the main focus of King [2008] and Perler [2013].

For (§5): The problem of transduction, especially the contrast between abstractive and illuminationist account of cognition, is dealt with in King [1994]. Spruit [1994] surveys the history of the debates over the need for an intellectual representation, a key feature in transduction. Klima [2011](a) takes up abstraction, while Pini [2015] looks at occurrent thought in Aquinas and Scotus. Henry of Ghent's views about how causality is related to cognition is taken up in Pickavé [2015].

For (§6): Singular thought is the main focus of Normore [2007] and King [2015].

For (§7): King [2007](a) gives an overview of how to think about representation and intentionality in the Middle Ages; Klima [2004], [2013](a), and [2015](a) give top-down accounts of medieval theories of representation, while Tweedale [2007] offers a historical survey. Aquinas is dealt with in Panaccio [2001] and in Brower and Brower-Tolland [2008]; his account is contrasted with that of Durand of St.-Pourçain in Hartman [2013], and with Ockham and Buridan in Klima [2011](a). King [2004] and Pini [2008] analyze Scotus's views of cognition and mental content. Ockham's alternative account, and in particular the question of his externalism, is treated in Brower-Tolland [2007](a) and [2007](b) and Panaccio [2015]; King [2003] emphasizes instead Ockham's shift to competencies.

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