for giving a coherent account of it. It might be that most of the difficulties that we face when trying to understand Aristotle had a root in the hidden tension between *Posterior Analytics* and *Metaphysics*, that is, between the strict sense of "definition" (which is a *logos* of essence and thus corresponds to substances), and one of the derivative senses of "definition" (as applied to the combination of a substance with its *kath' auto symbebekos*). But this is a very different story, which does not fit into the limits of the present work.[50]

50. This paper is part of a broader research on Aristotle's semantics and ontology, developed with the support of the Spanish Government (as part of the Research Project "Vagueness: Predication and Truth" HUM2005-05910/FISO). I wish to thank all the members of the research team for the cooperative reading of Aristotle. I also thank Alejandro Vigo for his very helpful comments on the draft of this paper. Finally, I am specially grateful to Angel d'Ors for continuous feedback and always valuable suggestions.

Insights of Avicenna

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On the Intuition of Real Essences

Aristotelian definitions claim to get at the real essences of objects. Aristotle himself distinguishes such real definitions from nominal definitions. [An. Po. II.10] These real definitions give *formulae* of the essences: what it is for things, primarily substances, to be. [Metaph. 1029b25-6]

For many today such pronouncements of real definitions amount to jokes. I need not resort to *post-moderni* like Foucault to make this point.[1] Famously Quine charges that what attributes something has are determined by convention and pragmatics. Take a human being like Xanthippe. If we are interested in her riding a (normal) bicycle, then being two-legged is essential to her, while being rational is not; if we are interested in her *qua* mathematician, then being rational is essential to her, while being two-legged is not.[2] To be sure, in our theories, both in biology and in politics, we find being rational more important to Xanthippe than being two-legged usually. If she lost her legs, we would still call her Xanthippe; if she lost her reason, we would tend no longer to call her 'Xanthippe' and 'a human being'—especially if she lost her reason by becoming a corpse. Rel-

1. Michel Foucault, Les Mots et les choses, (Paris, 1966).
2. Word and Object (Cambridge, 1960), p. 199.

ative to our theories, interests and ways of talking, we can construct worlds: worlds where human beings keep their nature and their rights so long as they remain rational, regardless of whether or not they keep their legs.[3] Yet, so the anti-essentialist charge goes, it is ludicrous and silly to think that our interests and needs determine the way the world is really, in itself. Why should our interests and theories give a privileged perspective on the world revealing its true inner nature? We can never know whether or not they do anyway. We would have to be Aristotles, "masters of all who know", removed from the mundane bustle of normal human beings and pronouncing *ex cathedra* about what essences things really have, which definitions in our dictionaries and theories are the real ones.[4] Then we the philosophers would descend regularly from these noble, noumenal heights to our ordinary lives of the mundane and merely phenomenal: our coffee breaks and the emotional squabbles typical of neurotic primates.

To be sure, pretensions to objectivity look silly, especially in light of the history of philosophy and the sciences. Kant gives striking examples. Above all, his assertion that Euclidean geometry gives the necessary structure not only for the phenomenal world but also for the pure intuitions of our experience has its ironies: today space-time appears Riemannian if not fractal, and, even for those with fairly standard human brains and two working eyes, the visual field is constructed in stages, one stage currently said to be 2½ dimensional. Again, most of Kant's own examples of the *a priori* not only seem not to be necessary but appear also to be in fact false: that gold is a yellow metal; that space is three-dimensional; that physical objects have weight; that eve-

3. So too Nelson Goodman, "The Way The World is, " in Problems and Projects (Indianapolis, 1972), pp. 30-1
4. Richard Rorty, Philosophy and the Mirror of Nature (Princeton, 1979), pp. 38-45.

ry event has a cause.

Likewise for Aristotle, who gives an *a priori* proof that it is impossible to prove geometrical claims in arithmetic: that is, that analytic geometry is impossible. [An. Po. I.7] Aristotle claims also that noûs, the active intellect, is infallible. He asserts that *noûs* cannot err in grasping the primary principles. [An. Po. 100b7-8; Eth. Nic. 1141a2-6] Plato had said the same. [Resp. 477-8; 532-3] But then, as Aristotle's worthy predecessors had *noûs* and did grasp what they at any rate took to be the first principles, their results should have been infallible too. Yet Aristotle claims that none of them were completely correct in claiming to having grasped the first principles completely, e.g., in their accounts of causality. [Metaph. I.3-10] Parmenides is guilty of eristic; Melissus committed the fallacy of denying the antecedent. [Phys. I.3] He charges his own teacher with making fundamental errors in his theory of Forms. How then has Aristotle himself attained this infallible perspective—a perspective from which he deduces the impossibility of analytic geometry?

Avicenna comes across even sillier. In addition to Aristotle's universals (quiddities *in re*), derived somehow by abstraction from perceiving singulars, he has universals "subsisting" but not "existing" by themselves (quiddities *in se*), apart from those existing *in re*. Somehow, once activated, our active intellects can ascend to know these quiddities and thereby validate the real definitions of things via having direct access to the "storehouse" of universals, the content of a universal active intellect.[5] This smacks of a neo-Platonism and of philosophic if not prophetic arrogance. It sounds as if my active intellect, once it has attained the password, can log on to the divine Wikipedia with its angelic lexicon. Avicenna comes across perhaps worse than Averroes, who wrote a commentary on Aris-

5. Fi Nafs, ed. Rahman, 243, 5-247, 2. Dimitri Gutas, "Intuition and Thinking, " in Aspects of Avicenna, ed. R. Wisnovsky (Princeton, Markus Wiener, 2001), p. 13.

totle's theory of tragedy while never having seen or read a Greek play, to Ortega y Gasset's bemusement. Indeed, in his own commentary on the Poetics, Avicenna tried to reconstruct the content of Greek tragedies like Oedipus the Tyrant from Aristotle's Poetics and its attendant *marginalia*. The result is tragic. Add on to this his immodest claims in his Autobiography of having mastered the Qur'rān by the age of ten and the field of philosophy while he was a student, and we have a fanatic and not a philosopher.[6]

On the other hand, Aristotle and Avicenna are no fools. Aristotle did much empirical research and seems to have founded many theoretical disciplines: logic, political science, biology, and ontology, to name a few. Avicenna has a vast and fairly original logical theory, made substantive contributions to the mathematics of infinitesimals, and wrote one of the two major medical texts used up to the nineteenth century in Europe as well as in Muslim areas.

Perhaps then, like Aristotle, Avicenna is not so silly. Rather perhaps our historical understanding or caricature of their positions is what is silly. To investigate this possibility somewhat, I propose here to investigate how Avicenna, following Aristotle, accounts for our ability to grasp real definitions and other fundamental principles. As Gutas says, for Avicenna, the acquisition of the first principles is "so central to his thought' it is the "*via regia*" to his system. I shall focus on the account given in Aristotle's Posterior Analytics and Avicenna's comments on it, contained in Al-Burhān. My solution depends upon having, first, a certain interpretation of Aristotle's position. Given that Aristotle does indeed proceed along its lines, we can see Avicenna following out its implications—and neither being silly: at any rate, not any sillier than us today.

6. The Life of Ibn Sīnā, ed. W. Goldman (Albany, 1974), 22, 5-36, 9; Dimitri Gutas, Avicenna and the Aristotelian Tradition (Leiden, 1988), pp. 194-8.

Aristotle's Grasp of the First Principles

...one must be content to state some points better than one's predecessors, and others no worse. [Metaph. 1076a15-6]

In the last chapter of the Posterior Analytics, Aristotle is investigating how it is possible for us to know the immediate premises, the primary principles, of demonstration. [99b20-6] Demonstration assumes these and cannot prove them. Aristotle rejects Plato's answer, that we have innate, pre-existing knowledge of these premises. [99b26] We are, he says, rather, in a middle ground where we do not have actual knowledge of these primary principles but where we also are not completely devoid of them. [90b30-4] As in his discussions of coming to be, Aristotle turns to the third option, the middle ground between being and not-being, that of potential being, what can be but is not in act. [Cf. Phys. I.7] We have then *noûs* in actuality, namely the actual capacity or potential (*dunamis*) to have this knowledge, although we do not yet have the knowledge itself in act. This potential knowledge is not as accurate or strictly a knowledge as the fully actualized and articulated knowledge of demonstration. [99b26-7; 99b33-4]

When Aristotle speaks here of "first principles", he is speaking not only of axioms and definitions but also of the universals signified in those fundamental propositions. [An. Po. I.10][7] We have to explain how we came to know, for example, not only that taking equals from equals pro-

7. F. Solmsen, Die Entwicklung der aristotelischen Logik (Berlin, 1929), pp. 95-101; D. W. Hamlyn, "Arlstotellan Epagoge, " Phronesis, Vol. 21 (1976), p. 178; Jonathan Barnes, trans. & comm., Aristotle's Posterior Analytics, First Edition, pp. 249; 254-6; Second Edition (Oxford, 1994), p. 271; Deborah Modrak, Aristotle: The Power of Perception (Chicago, 1987), pp. 162-4; Charles Kahn, "The Role of *Noûs* in the Cognition of First Principles in Posterior Analytics II.19, in Aristotle on Science: The Posterior Analytics, ed. E. Berti (Padua, 1981), pp. 385-6. He notes, n. 2, that Euclid didn't keep concepts and propositions apart either. However David Charles, Aristotle on Meaning and Essence (Oxford, 2000), pp. 268-9, nn. 45 & 47, denies the conflation.

duces equal remainders, but also what a line is, and that lines exist. [76a40-b6] Again, how is it possible to know that the essence of a human being is to be a rational animal, as well as what 'rational' and 'animal' signify? When Aristotle seeks to explain how we come to grasp the universals from sense perception and experience with individuals, he is seeking to explain at the same time our acquisition of concepts and of propositions, namely, of thoughts of the relations between those concepts.

For Aristotle the things most evident in themselves are these first principles: these concepts, their definitions, axioms, and postulates. The axioms are the principles common to all the sciences, like the principle of non-contradiction, while postulates are those peculiar to a particular science, like the parallel postulate in geometry. Normal science then consists in demonstrating theorems via deductive syllogisms from these universal first principles along with other assumptions.

Aristotle then tries to explain how we come to grasp such universal principles from sense perception. By sense perception we become directly acquainted with particulars. Repeated sensory experience of similar particular things produces a single memory in the mind, a phantasm applying indifferently to all these particulars. When we apprehend this phantasm as universal, sc., as applying to all similar cases, even beyond those actually experienced, we have apprehended the universal. Aristotle calls this ability to grasp the universal 'noûs' ('comprehension' or 'intellect'). 'Noûs' then is "a generalizing capacity or ability that is responsible for the fact that a universal point, something, that is, which goes beyond what is grasped in sense perception, may come to be present to the mind."[8] Induction in general then consists in "acquiring insight into some universal point as a consequence of attending to particular cases."[9]

8. T. Engberg-Pedersen, "More on Aristotelian Epagoge, " Phronesis, Vol.24 (1979), p. 308.
9. Pedersen, "More on Aristotelian Epagoge, " p. 305. Cf. Topics 105a13-4; 100a6-7.

Aristotle seems to have offered a mechanical, psychological explanation: sense perception plus memory plus *noûs* yields the universal.[10] Even if we could, and did, apprehend universal principles in this way, the mechanical nature of this process sets Aristotle another problem: given that we come to apprehend the universal without volition, willy-nilly, why then do not all people with the relevant experience agree on these principles? Like Socrates, or Descartes for that matter, Aristotle seems to present the picture that, if we but attend clearly to our thoughts, we cannot but help acquire knowledge of the universal. But most of us do not.

I do admit that at times Aristotle sounds as if he accords *noûs* an infallible status. [An. Po. 100b5-14; Eth. Nic. 1141a2-6] Perhaps Aristotle has not completely departed from his dogmatic Platonic origins. Yet in practice Aristotle looks much more flexible in pursuing the truth: he will abandon lines of inquiry but not his conviction that he can move towards the truth. So too he acts when requiring demonstrations of the cause (*dioti*) and then accepting demonstrations of the fact (*oti*); in saying that what holds for the most part is contingent, but then basing scientific demonstrations on what holds for the most part. [An. Pr. 32b3-6; An. Po. 78a22-8; 87b21-2] We can see him making similar allowances for the grasp of first principles by noûs. He describes the first principles also as more convincing and better known to us—as opposed, perhaps, to better known in themselves? [An. Po. 72a31-2; 72b1] He speaks of "presupposing" the principle of non-contradiction. [71a12] He also allows for different methods of reaching first principles depending on circumstances. [Metaph. 1098b1ff.] All this makes thinking fallible. For Aristotle likens thinking to perceiving. [An. 427a19-20] As Aristotle allows for error in thinking (*dianoeistai*) as well as in perceiving, I find it plausible that *noûs* can make mistakes [427b13; 428b25-30]

10. The universals thus generated look mostly to be single concepts. However Aristotle also has to generate axioms like the principle of non-contradiction.

Again, in the Rhetoric Aristotle says that the same ability enables us to know the true and the plausible, and surely both of these are not infallible. [1355a14-7]

Indeed, given that Aristotle holds *noûs* to be a human mental capacity, it would be ludicrous for him to hold it to be infallible. For others before him have used it in apprehending candidates for first principles. Yet Aristotle holds them to have been mistaken often.[11] Aristotle seems to view thinking like sense perception: both generally give reliable results, but both can be mistaken.[12] Consequently I think that what Aristotle says about *noûs* presents no obstacle to my account of how he says we come to grasp first principles.

Aristotle's pronouncements on the infallibility of *noûs* give one reason to preserve the distinction between concept and proposition. As (Pseudo-) Simplicius remarks, no error is possible in thinking of indivisible, simple forms, whereas error is possible in making statements about them, as statements have parts and so are compound.[13] What does thinking of a simple form involve? As Simplicius agrees, the judgement that I am perceiving an instance of it, or that it has a certain definition, or even that it "is", involves thinking something not simple but complex. This seems to make *noûs* an ability to apprehend intelligible objects and claims about them. The act of apprehending simple items like concepts is infallible, while apprehending their definitions and other claims about them still has the possibility of error. It then will be able to grasp truths about them—but also falsehoods.[14] Still my apprehension of each part of the statement as being a constituent of it can remain infallible.

11. To be sure, Aristotle does say that in the apprehension of simples there can be no mistake, as there has been no judgment [430a26-7]
12. Kurt Prizl, "Opinions as Appearances: Endoxa in Aristotle," Ancient Philosophy, Vol. 14 (1994), p. 48; Jonathan Barnes, "Aristotle and the Methods of Ethics," Revue Internationale de Philosophie, Vol. 34 (1980), p. 509.
13. [Ps.] Simplicius, in de An. 249, 3-15; 250, 16-39.
14. Cf. Plato's account of falsity in the Sophist.

Noûs then enables us to have direct intuition of intelligible objects. I intuit that I am perceiving Coriscus as the one who is approaching. I cannot err in perceiving this judgment, even though the description can err. I can think that π is a rational number; I cannot be mistaken that I am apprehending π thus, although I can be mistaken about the correctness of that insight. A non-rational animal, lacking noûs, cannot apprehend π thus or in any other way. *Noûs* then become the ability to have intellectual experiences or apprehensions. It does not provide a guarantee of their truth. It is infallible at what it does, but it does not have the function of guaranteeing the truth of the first principles—only of making it possible that we can apprehend them at all.[15]

At best, for Aristotle, we have "knowledge" of these first principles—the universals, their essences, and statements about them—inchoately and inarticulately at first. Just so, a child has quasi-knowledge of the universal woman when seeing her mother. [Phys. 184b12-4] It is worth noting that 'mother' also is not a substance term but a relative. So, if Aristotle is speaking precisely—and there is good evidence to think he is, as, like brute animals, children have no acquaintances with substances as substances—the child does not perceive the natural kind, the human being, but only an accident, the human being in her relation as parent. Moreover, the child also does not judge certain objects to be 'mother' in virtue of the proper definition of the relative 'mother', but only by her accidental attributes, given in *per accidens* perception, of having the visual appearance of her mother. So the child has neither an accurate apprehension of the universal nor correctly identifies the individual things that exemplify that univer-

15. Michael V. Wedin, Mind and Imagination in Aristotle (New Haven, 1988), p. 171: "In any case the infallibility of mind with regard to its objects is problematic at best. Reflexive self-reference, however, fares rather better. One simply does not have any idea how to concoct the required discreditation story, however farfetched."

sal. Still, the child has started to "think" in terms of universals, although, perhaps, not in the strict sense of 'think'. The universal in its essence need not be grasped; i.e., the child need not know its definition. In a sense, animals too have perhaps this acquaintance with the universal. Aristotle does admit that they have experience and practical wisdom of a sort. [Metaph. 980b25-7; Eth. Nic. 1141a26-8][16] A child, or a goat for that matter, might recognize as 'mother' or as 'woman' or as 'human being', via its actual past experiences, only things having dark skin or red hair. Still, in a sense, there is experience of the universal. For Aristotle defines the universal as "what is naturally predicated of many". [Int. 17a39-40] Thus, a child, in recognizing or calling many objects 'mother' on the basis of a perceived if not a real similarity between those objects, is making use of the universal, at least in a primitive way.[17]

Accordingly, we need not have a clear and distinct grasp of the first principles. We need grasp them only indistinctly and fallibly, as we develop this capacity. We begin with an indistinct and perhaps inaccurate grasp of the universal. Induction is the process whereby we come to be familiar with these first principles determinately. [72b29-30] We head towards a more accurate apprehension of the universal, by recognizing that it is not necessary for something to have red hair or dark skin to be a mother or a human being. In making these judgments (which, in historical fact, have been difficult for many societies to make!!), we may come to grasp the definition, the

16. Again, at Metaphysics 981b10 as well as in the passages cited above, Aristotle says that perception gives "knowledge" (γνωεσις) of particulars. Dorothea Frede, "Aquinas on Phantasia," in Ancient and Medieval Theories of Intentionality, ed. D. Perler. (Leiden, 2001), p. 161, observes that intellectual knowledge of the definition of a universal does not suffice for identifying a particular instance of it. Imagination does the filling in of those details. All animals have imagination of a sort [An. 434a5-10] and so they will have knowledge of a sort.

17. Barnes, Aristotle: Prior Analytics, Second Edition, p. 266: "he means that we perceive things as A; and that this, so to speak, lodges the universal in our minds from the start—although we shall not, of course, have an explicit or articulated understanding of A until we have advance to Stage (D)." He notes, pp. 266-7, that man seems to be an incidental object of sense

formula of the real essence of a universal expressing a natural kind (as opposed to a merely conventional or a Cambridge universal).[18] In doing so we come up with definitions for the concepts and connect them up by making judgements. We can err in these judgements, including those that we take to be the definitions of the concepts being used.

As Aristotle's psychology describes in sparse detail, apprehension of the primary universal principles arises in stages from sense perceptions, for those animals fortunate enough to have all of the stages. Some animals have only the perceptions of the moment with no retention; others have these present perceptions with the ability to remember them (memory), and to retain and recall them (recollection and imagination) [Mem. 450a15-9]; others can combine their memories of particular sensations into a single experience. "For the many memories of the same object complete the capacity for a single experience." [Metaph. 980b29-981a1; cf. An. Po. 100a4-5][19] These stages arise from the repeated application of abstracting, taking the output of one stage as the input of the next stage. Aristotle views induction as a process of abstraction of universals from singulars.

Aristotle has then a chain of mental processes—perception, memory, recollection, imagination, and experience—each using the materials produced by the prior process in the sequence. [20] Deborah Modrak distinguishes three stages involved in coming to grasp the universal first principles from particulars: 1) be able to extract instances of the universal, as in being able to recognize the human and distinguish it from the non-human 2) be able to use the universal term 'human' correctly, as being said of many 3)

18. Modrak, Aristotle's Theory of Language and Meaning, pp. 85; 90.

19. Alexander, in Metaph. 4, 15-22, wants Aristotle to deny that animals have experience altogether. Still the text suggests that animals do have a bit of experience: as Hume will have it later: of the same sort as human beings but limited by having less capacities of memory and sensation. Cf. Ross, Aristotle's Metaphysica, Vol. I, p. 117

20. Deborah Modrak, Aristotle's Theory of Language and Meaning, pp. 102-3.

be able to grasp the concept "required for knowing what a human being is...a real definition." Arguably all animals having imagination can learn to recognize instances via having a generalized image as a crow does of a man or a sheep of a wolf. The next stage of learning universal terms belongs to rational animals alone. The final stage belongs to those rational animals who theorize and construct scientific demonstrations. Here grasping the universal so as to be able to provide the primary principles for science operates on experiences for its material. "From experience or from the universal now at rest in the soul" arise the principles for art and for science. [100a6-7; Metaph. 981a1-3][21] The process results in acquiring a hierarchy of universals so as to be able to locate and intuit the first principles, as Brentano has said.[22] Yet our understanding of this hierarchy and the principles thus attained has no infallibility, although at times Aristotle expresses his hopes. After all, once he comes up with first principles and defends them, he is acting as if they are necessarily true: at any rate, he believes that they are.

> The investigation of the truth is in one way hard, in another easy. An indication of this is found in the fact that no one is able to attain the truth adequately, while, on the other hand, no one fails entirely, but every one says something true about the nature of things, and, while individually they contribute little or nothing to the truth, by the union of all a considerable amount is amassed. [Metaph. 995a24-7]

Avicenna's Essences

Avicenna has a metaphysics focused on quiddity (or essence). For him relationships between these quiddities

21. T. Engberg-Pedersen, "More on Aristotelian Epagoge, " p. 317, notes that translators like Mure assume that the experience itself is of the universal, and so take the "or" inclusively.

22. Franz Brentano, The Psychology of Franz Brentano, ed. & trans. Rolf George (Berkeley, 1977), p. 145.

ground, or serve as truth-makers, for the propositions of Aristotelian science. His famous doctrine of the threefold distinction of quiddity details how. Here I summarize it.[23]

In his commentary on Porphyry's Isagoge (known as the Logica in the Avicenna Latinus) Avicenna presents this doctrine, known in the West as the *triplex status naturae*:

> And the quiddities of things may be in individual things, and they may be in the mind; so they have three respects: the respect of quiddity inasmuch as it is that quiddity is not added to one of the two modes of existence, nor to what is attached to the quiddity, insofar as it is in this respect. And quiddity has a respect insofar as it is in individuals. And there accidents which make particular its existence in that are attached to it. And it has a respect insofar as it is in the mind. So there accidents that make particular its existence in that are attached to it; e.g., being a subject and being a predicate, and universality and particularity in predication ... [24]

Avicenna is saying that quiddities have three respects: in themselves, in things, and in the mind. Quiddities in themselves have no accidents, whereas quiddities in individuals and those in the mind each have accidents proper to them in their respect. Quiddities in individuals and quiddities in the mind "exist", in different ways, while quiddities in themselves do not exist, yet have "being" *(kuwn)*.

All this doctrine may seem to depart radically from Aristotle and to be heading towards Plato. However, Aristotle himself holds that, although essences are primarily in the category of substance, still there may be essences in other categories as well in a secondary way. [Top. 101b38; Metaph. VII.6] For Aristotle what makes substance have priority is first that a substance term is presupposed in the definition of items in non-substantial categories [Metaph. 1029b31-3; 1031a1-3] and second that the existence of an es-

23. See Allan Bäck, "The *Triplex Status Naturae* and Its Justification," Studies in the History of Logic, ed. I. Angelelli & M. Cerrezo (Berlin, 1996)

24. Avicenna, Al-Madkhal, ed. G. Anawati *et al.* Cairo, 1952) 15, 1-6 [= Logica 2r col. 2, in Opera Omnia (Venice, 1508)].

sence in some thing depends upon its having a substantial essence; i.e., the substantial essence provides an enduring substratum in which the non-substantial essences may come and go. [1028a33-4; Cat. 4a10-3] Now, if we consider definitions of abstract terms, and allow the constituents of the definitions likewise to be abstract, then the first reason loses its force. Aristotle himself defines 'whiteness' as "a color standing out in sight".[25] Only concrete paronyms like 'the white' presuppose the existence of substances: 'the white' is 'the white thing', namely whiteness in some substance. Moreover, if we consider definitions to be made on a level apart from the existence of things, and allow it to be meaningful to speak of what a thing is and its being in itself, in the sense of 'subsistence' (*kuwn*), that is to say, in terms of its being possible, apart from its actual existence, then the second reason loses its force too.

Thus Aristotle allows for there to be essences (*ousiai*) in all categories of being. He considers a definition to be "a formula of the essence". So Aristotle admits definitions for items in the accidental categories: a good thing, as many of the items in the sciences are accidents of substances, such as numbers and shapes. Moreover he says that the items in the categories are the abstract paronyms like whiteness and not the concrete ones like the white. [Cat. 10a27-32] Aristotle also gives definitions for 'genus', 'contrary', and 'being', even though these terms do not signify items in the categories. Aristotle himself has left it open for there to be quiddities for terms transcending the categories, like 'being' and 'one' and 'quiddity' itself, and for terms of second intention, like 'genus' and 'proposition'.

Avicenna is following all this up. He does retain the priority of substance in definition and in essence with respect to existent things, and their definitions *qua* existent. However he simply denies it on the level of quiddities in

25. Cf. Ammonius, in Cat. 45, 2; 40, 13-4; Porphyry, in Cat 124, 5.

themselves.[26] Thus he says that whiteness is a quiddity in itself just as much as humanity.[27] He has quiddities in the mind like 'being a predicate', and allows for real definitions of substances and quiddities He claims also that we can have direct intuitions of the transcendentals like being, as illustrated in his famous example of the flying man.[28]

The doctrine of the threefold distinction of quiddity claims that a quiddity has three modes, not that there are three distinct types of things comprising that quiddity. For then the universal term naming that quiddity would have three distinct referents.[29] If there were three referents, the universal term would just be ambiguous and name three things. In contrast, here the same thing is being talked about somehow, yet in three different ways or respects.

Avicenna seems to view the connection between these different senses of quiddity as similar to the relation between the different senses of 'healthy' or 'medical' that Aristotle discusses in Metaphysics IV.2. As Aristotle says, these terms have different uses and definitions, but a focal meaning (*pros ti*). So too, he argues, 'being', though said in many ways, has a focal meaning. In effect, Avicenna is now extending this doctrine to essences in general in his threefold distinction of quiddity.

In sum Avicenna claims that essences have three respects, in virtue of which they may be spoken about. Quiddities in these three respects serve as truth-makers to ground our assertions. These doctrines have sources in Aristotle's texts. Let me give some further details.

26. Al-Ilāhiyyāt, ed. G. Anawati et al. (Cairo, 1983), 85, 12 [= Metaphysica, in Opera Omnia, 9v col. 1].
27. Al-Ilāhiyyāt 202, 3-8; 218, 10-3; 220, 9-12; 235, 1-5; 353, 2-5 [= Metaphysica 87r col. 2; 88r col. 2; 88v col. 1; 90v col. 1; 99v col. 2].
28. For a comprehensive discussion see Deborah Black, "Avicenna on Self-Awareness and Knowing that One Knows, " in The Unity of Science in the Islamic Tradition, eds. S. Rahman, T. Street, and H. Tahiri (Dordrecht, 2008).
29. Avicenna, The Metaphysica of Avicenna, trans. & comm. P. Morewedge (New York, 1973), p. 33 (12).

The Quiddity in Itself

To speak of the quiddity in itself is to stipulate that the universal term is to be considered solely with respect to its definition.[30] 'Man', taken to represent a quiddity in itself, signifies only what being a man is. To be a man is, let's suppose, to be a rational animal, and hence also to be what it is to be an animal. The quiddity in itself will thus include the definition of the universal term, and the definition of the parts of that definition.[31]

Because the quiddity in itself considers only what the quiddity is by definition, Avicenna often refers to the quiddity in itself by an abstract term; instead of 'being human', 'being animal', he says 'humanity', 'animality'. Thus humanity is a quiddity in itself, and it is rationality plus animality, that is, rational mobile animate corporeal substantiality.[32]

Avicenna is quite explicit that even those attributes that are necessarily inseparable from the definition—the *propria* or proper accidents—do not constitute the quiddity in itself.[33] So, for example, humanity is a quiddity in itself, and being a body belongs to it, since, when the parts of the definition of 'humanity' are given, and then defined in turn, being a body is predicated of humanity.[34] For the definition of 'humanity' is 'rational animality', and that of 'animality' is 'mobile life', and of 'life' 'animate body'. Hence being a body is an element constitutive of the quiddity in itself humanity. However, neither corporeity, which Avicenna takes to be mere extension in space, nor three-dimensionality is such an element, although he holds that if something is a body, it must be three-dimensional and occupy space. Rather,

30. Al-Ilāhiyyāt 201, 7-13. [= Metaphysica 87r col.2].
31. Al-Madkhal 36, 8; 48, 15 [= Logica 4v col. 2; 6r col. 1].
32. Al-Ilāhiyyāt 236, 6-8; 241, 5-16 [= Metaphysica 90r col.2; 90v col.2]; Al-Madkhal 28, 13-29, 6 [= Logica 3v col. 2].
33. Al-Ilāhiyyāt 354, 1-8 [= Metaphysica 99v col.2]; Al-Madkhal 29, 15-30, 1 [= Logica 4r col. 1].
34. Al-Ilāhiyyāt 69, 9-11; 214, 1-216, 9 [= Metaphysica 76r col.1; 88r col. 1].

corporeity and three-dimensionality are *propria* of humanity that come to be attached to it necessarily when it comes to exist via combination with matter.[35]

The Quiddity in the Individual

Quiddities in individuals are individual material objects. These things have quiddities in themselves. For instance, an individual, say, Socrates, may have the quiddities of humanity, justice, whiteness, snub-nosedness, fatherhood. Thus, this man, Socrates, is a man, is white, is just, is snub-nosed, is a father. There being individuals with many different attributes is made possible through a substratum that is able to receive and link up many compatible quiddities in themselves—humanity, whiteness, justice.[36] Quiddities are said to exist in individuals because they are linked together in this substratum.[37]

For Avicenna, matter is in general the notion of serving as a ground or substratum for the reception of a type of accidents.[38] He recognizes various types of matter. The type of matter here, "real" matter, enables quiddities in themselves to become associated with certain quiddities that are not contained in their definitions, namely the sort of quiddities classified in the ten categories. In this way, "accidents happen" to quiddities in themselves.[39] Some of these accidents necessarily accompany the instantiation of a quiddity in itself; these are the *propria* of the substance that are convertible with constituents of the definition.

35. See Allan Bäck, "Ibn Sina on the Individuation of Perceptible Substance," Proceedings of the PMR Conference, Vol. 14 (1989). Abraham Stone, "Simplicius and Avicenna on the Essential Corporeity of Material Substance," in Aspects of Avicenna, ed. Wisnovsky, nn. 24; 108, disputes this claim.
36. Al-Ilāhiyyāt 202, 3-8; 204, 16-205, 2 [= Metaphysica 89r col. 2].
37. Al-Ilāhiyyāt 208, 5-9 [= Metaphysica 87v col.1]; Al-Madkhal 74, 11-75, 21 [= Logica 8v col. 2]; Al-ʂabīyat, ed. S. Zayed (Cairo, 1983), Vol. II.1, 13, 1-12 [= Sufficientia 14r col. 2, in Avicenna, Opera Omnia].
38. Al-Najāt 451; Al-Ishārāt 101-2. Cf. Anne-Marie Goichon, La distinction de l'essence et de l'existence d'après Ibn Sina (Paris, 1937), pp. 468-73.
39. Al-Madkhal 15.4-5 [= Logica 2r col. 1].

The complex of essential constituents and *propria*, in association in the material substratum, constitutes an individual thing's *nature*, what Aristotle calls a primary substance.[40] The persistence of that nature is necessary and sufficient for the persistence of that individual. Quiddities in themselves other than those constituting that nature may come to be and cease to be attached to that nature: these are the common accidents.[41]

The accidents received by these individuals are those of first intention, i.e., those in the Aristotelian categories. I shall call such accidents *material accidents*, and the sort of existence enjoyed by quiddities having such accidents *material existence*. As this sort of existence concerns what we ordinarily call reality, it may also be called 'existence *in re*'. So too quiddities in individuals may be called 'quiddities *in re*'. I shall use 'attribute' to denote accidents, *propria*, or essential constituents indifferently; thus 'rational', 'risible', and 'bald' all denote material attributes.

Quiddities in individuals are normally signified by concrete terms used concretely. Thus, 'man' in general is not a quiddity in individuals; rather, 'this man', 'a man' is. Such singular terms indicate an instantiation of the associated quiddity in itself, humanity. That individual instance has the quiddity in itself humanity, and also other quiddities in themselves: essential constituents of humanity, material accidents inseparable from the presence of the substantial quiddity in itself in matter—the *propria*—; material accidents that are not inseparable—the contingent accidents.

The Quiddity in the Mind

Quiddities in the mind are, in a broad sense, concepts. These quiddities are abstracted, via sense perception, imagination, and the intellect, from quiddities in individuals.[42] Being abstractions, quiddities in the mind have a dual nature. On the one hand, they represent individual as well as common features of quiddities in individuals. Thus two real individuals, Socrates and Plato, are both human, and each may be called man, where 'man' signifies the nature that they have in common, sc, all the constituents of the quiddity humanity and its *propria*. Likewise they have many other common attributes: being male, Greek, white, philosophical, in the forum. All these attributes— man, Greek, in the forum, etc.—are concepts, also known as quiddities in the mind.

On the other hand, quiddities in the mind, being abstractions, also have certain formal features not found in the things from which the abstractions arose. Thus man, a quiddity in the mind, is a common notion, is essential to things that are men, and indeed is a species. Being common, being essential, being a species, are formal attributes or accidents that apply to the abstractions but not to the things.[43]

Quiddities in the mind are strictly signified by concrete terms used abstractly. Thus, 'man is a species', 'man is animal', and 'Socrates is man', (as distinct from 'Socrates is a man') are true claims about quiddities in the mind. Given that quiddities in the mind have a distinct type of accidents, formal accidents, and that for each such type there corresponds a distinctive sort of matter and existence, it is clear why Avicenna says that quiddities exist in the mind in a distinctive way. We may call that sort of existence *formal*, to distinguish it from the *material* existence of quiddities in individuals. As this kind of existence is based in the mind, it may also be called existence in the mind (*in intellectu*).

It is a feature of the threefold distinction *of* quiddity that types *of* true statements accumulate as we move from the respect of quiddities in themselves to the one in individuals to the one in the mind. Definitions alone are true

40. Al-Madkhal 17, 10; 36, 8 [= Logica 2v col. 1; 4v col. 2]
41. Al-Ilāhiyyāt 221, 10-1 [= Metaphysica 88v col. 1].
42. Fī Nafs, ed. G. Anawati, 148, 14-5; 184, 9-10; 208, 3-209, 7.
43. Al-Ilāhiyyāt 197, 1ff. [= Metaphysica 86v cols. 1-2].

of quiddities in themselves; definitional and materially accidental statements are true of quiddities in individuals; definitional, materially accidental, and formally accidental statements are true of quiddities in the mind. Of course, these statements, when made strictly, will have distinctive forms in each respect: consider the different subject terms, 'humanity', 'men', 'man'.

Avicenna's Non-Platonism

I have been characterizing Avicenna as a follower of Aristotle, However, with some reason, many historians of philosophy describe Avicenna as a Platonist.[44] His quiddities in themselves resemble Plato's Forms. His talk of emanation from the necessary being smacks of Plotinus. Likewise for his talk of the activated human intellects merging back into the World Soul and having direct acquaintance with quiddities in themselves.

On the other hand, he attacks the theory of Forms. He denies their existence repeatedly.[45] He follows Aristotle in abstracting the universal from the singular in Fī Nafs V.5. He endorsees enthusiastically Aristotle's critique of Plato, especially the objection that it is incoherent for a single Form to be present in many instances simultaneously.[46] Once again he has departed from "the second teacher" Al-Fārābī, who is indeed a neo-Platonist.

From this historical perspective, Avicenna is befuddled: he has endorsed both a Platonism and refutations of it, perhaps by heedlessly embracing doctrines from the Greek texts received uncritically. The reception of neo-Platonist works like the Liber de Causis as works of Aristotle by some Islamic philosophers reinforces this view.

44. See Dag Hasse, "Avicenna on Abstraction, " in Aspects of Avicenna, ed. R. Wisnovsky (Princeton, Markus Wiener, 2001), nn. 2-5 for some instances.
45. E.g., Al-Burhān 128, 21-2.
46. In The Metaphysics of Avicenna trans. & comm.. P. Morewedge (New York, 1973) §12.

However Avicenna was critical of this reception. On the basis of his analysis of their doctrines, he questions the authenticity of some neo-Platonist works attributed to Aristotle.[47] He wonders even whether Aristotle wrote the Categories, as it seems inconsistent with doctrines of the Metaphysics. He expresses doubts about the authenticity also about the so-called Theology of Aristotle, known now to be spurious.[48]

So I follow Gutas, Hasse *et al.*, who assert that we should not construe Avicenna as paying mere lip service when he comments with approval on passages from Aristotle.[49] They argue that Avicenna is serious about [our knowledge of?] universals coming from abstraction from singulars and that this is not merely a *façon de parler* for a passive reception of forms from the Agent Intellect—a standard view e.g. by Aquinas and Brentano.

Indeed, some of Avicenna's most central doctrines look Aristotelian more than Platonist. For instance, his view that there are unrealized possibilities and many things existing *in re* are contingent gives a strong reason to reject this approach. A neo-Platonist emanation from the one even to the ephemeral individuals is a necessary process. In contrast Avicenna insists upon real contingency.

Again concerning the individual Avicenna has an Aristotelian theory of substance and rejects a bundle theory.

> So if you say: Zayd is the handsome, tall, literate so-and-so [man]--as many attributes as you like, still the individuality of Zayd has not been determined for you in the intellect. Rather it is possible for the concept consisting of the totality of all that to belong to more than one.[50]

Avicenna is mentioning and rejecting a bundle theory, wherein an individual is a combination of universals. Such

47. Al-Maqūlāt 8, 11-5.
48. "Letter to Kiyā, " Section 3, in 'A. Badawī, Aristū 'inda l-'Arab (Cairo, 1947), 120, 9-122, 8; trans. Gutas, Avicenna and the Aristotelian Tradition, p. 64.
49. Gutas, "Intuition, " p. 30; Hasse, "Avicenna on Abstraction, " p. 39, nn. 4 & 5; 45-6; 57 nn. 62-4.
50. Al-Madkhal 70, 1-20 [= Logica 12r col.1].

a bundle theory seems Neo-Platonist. Already in Plato's Statesman, an "individual", strictly speaking, is something that cannot be divided any further, by adding on additional universal attributes: it is a maximally complete bundle or set of universal Forms. In rejecting it in favor of substance, Avicenna once again is showing that he is endorsing positions of Aristotle.

Let us see if he does the same with intuitions of the real essences: the Platonist position would be having direct apprehension of the Forms, then recollecting them, and thereby being able to ground the axioms and definitions of the sciences. [Resp. 510b-511d] Aristotle's way would consist in starting from the sense perceptions most evident to us and working from them via abstraction and induction to the first principles most evident in themselves.

Abstraction and Intuition

> So abstraction is, as it were, a mixture of perceptual induction and intellectual deduction based upon the difference of what is *per se* and what is *per accidens*.[51]

At the end of his discussion of demonstration, Avicenna, following Aristotle's text closely, wonders how we can know the principles of demonstration. He too rejects the doctrine that we once had knowledge of these principles, have forgotten them, and need only to be reminded to recollect them.[52] Once again Avicenna is rejecting Platonism. Still he admits the fact that we do have demonstrations following from the basic principles of axioms and definitions. For we have already some demonstrative science. How to explain the fact? We do not acquire knowledge of the first principles by demonstration: this would be absurd, as it would require circular reasoning or begging the question.

51. Avicenna, Al-Burhān 162, 7-8.
52. Al-Burhān 254, 10-4

Again echoing Aristotle, Avicenna says that like most other animals human beings have the ability to grasp the forms of things by perception and store them in the imagination.[53] As in his psychology, Avicenna goes on to locate the various mental abilities in different parts of the brain.

One major problem lies in how it is possible for us to know these quiddities in themselves? Somehow we are able to judge that not all attributes belonging to all instances of a species constitute part of its definition or even belong necessarily to it.[54] Avicenna makes this point explicitly. He gives the example: what if all humans were from the Sudan?[55] Then we would conclude from experience and abstraction that all human beings are black, perhaps essentially so. But we don't. So how is this possible?[56] Somehow we make such inferences.

Following Aristotle, Avicenna suggests: by leaps of intuition (noûs). Aristotle left it vague how this could happen. Like others before him, Avicenna is trying to work out the details.[57]

The Unity of Intuition in Avicenna

Gutas thinks that Avicenna switched his account of intuition due to an eschatological motivation: on the first account, where thinking and intuiting are located in a certain part of the brain, there is no thinking after death; the second account makes this possible. In the later account Avicenna distinguishes intuition from thinking: the former operates near instantaneously on the primary intelligibles

53. Al-Burhān 255, 4-7.
54. W. D. Ross, Aristotle: De Anima (Oxford, 1961), p. 47, suggests that productive mind "divines the existence of abstractions that are never presented in experience."
55. Jon McGinnis, "Avicenna's Naturalized Epistemology and Scientific Method", in The Unity of Science in the Arabic Tradition, S. Rahman *et al.* eds. (Berlin, 2008), pp. 144-5, gives and discusses similar passages. I agree with him that Avicenna has a naturalized epistemology in the sense that he is try8ing to explain the natural phenomena.
56. Al-Burhān 46, 11-6; 48, 19-22; cf. Fi Al-Nafs, ed. G. Anawati (Cairo, 1962), II.2.
57. Alain de Libera, L'art des généralités (Aubier: Paris, 1999), p. 28.

(the quiddities in themselves?], the latter discursively via operating upon the concepts (the quiddities in the mind).[58]

Gutas observes correctly that Avicenna develops his account of intuition from Aristotle's sparse remarks on acumen, a talent for finding the middle term quickly. [An. Po. 89b10-4; Eth. Nic. 1142a32-b6][59] Yet, apart from this dimension of rapidity, intuition has another, more profound dimension. It provides the means by which we apprehend quiddities in themselves.

Recent scholarship on Avicenna has not focused much on his logical treatises, but on his metaphysics and psychology. Perhaps this focus misleads us. To use a simple criterion, just look at the quantities of writing: Avicenna wrote far more on logic—and then on medicine—than on anything else. A logical—and empirical—focus may help us to understand the unity of his conception of intuition. Consider Descartes likewise: philosophers tend to ignore the vast majority of his works, which are on mathematics and science, or Aquinas, more than half of whose works consisted in Biblical commentaries.

I am not rejecting the developmental account of Gutas, Hasse *et al.* according to which Avicenna develops his doctrines and focuses on different aspects as he continues to write. I do reject accounts without sufficient textual evidence for such changes, where those who make them rely on certain interpretations of Avicenna's texts. I likewise reject those accounts according to which Avicenna is a Platonist who makes Aristotelian, non-Platonist assertions either due to intellectual confusion or hiding his real views. I hold these rejections provisionally; perhaps sufficient evidence will come along to abandon them. But initially I take a unitarian view, where

58. I am identifying the secondary intelligibles with the quiddities in intellectu. Alternatively, these might be what results from combinations of the primary intelligibles. See Gutas, Avicenna, pp. 171-2, who observes that these conceptions in the early works of Avicenna are hazy.

59. Gutas, Avicenna, pp. 166-77; cf. "Intuition;" Hasse, "Avicenna on Abstraction, " n. 8.

Avicenna has a consistent theory, and a respectful attitude, according to which Avicenna is not silly. So far this approach seems to have worked out. So I suggest an alternative interpretation consistent with a unitarian account. On it Avicenna does not change his views so much as he develops them—and moreover takes reasonable and consistent positions.[60]

As for the two accounts of intuition, I do agree that the first account, locating intuition in the brain, seems to leave no way for the individual intellect to persist after death, while the second account does so. Gutas has presented clear evidence that Avicenna thought first that grasping the intelligibles requires the activity of a certain part of the brain and later that it need not do so: once actualized and put into contact with the storehouse of intelligibles in the divine active intellect, a human active intellect could continue to operate after the brain had perished. I do question, though, whether Avicenna changed his theory in order to get a result that would satisfy his psychological and mystical needs. This would give Avicenna a dogmatic motivation extrinsic to his philosophizing. Rather, I suggest, working out the implications of his philosophical positions, Avicenna came upon an account that happens to have these results, which, to be sure, he found delightful and attractive. I do concede that Avicenna's leanings towards mysticism and immortality could have given him a psychological motivation to work on his theory. Still that motivation concerns the context of discovery and not the context of justification.

Good support for my view comes from the end of Al-Burhān. Commenting there on Aristotle's account of how we acquire first principles in Posterior Analytics II.19, Avicenna mixes the two accounts of intuition distinguished above. He says that the soul acquires the most fundamen-

60. Cf. Hasse, "Avicenna on Abstraction, " pp. 51=2: "One sees that Avicenna has not changed his basic position since the Compendium with regard to the intellect's relation to the senses. Instead he has added new material." Hasse does go on to maintain that Avicenna changes his mind about the role of the active intellect.

tal principles when united to the divine effluence, while it acquires the less fundamental ones from the middle terms of demonstration and from experience.[61] Here the two accounts of intuition that Gutas locates in Avicenna have a common base. Aristotelian science consists in demonstration. Hitting upon the middle term is required for demonstrations; direct apprehension via thinking and intuition is required for grasping their first principles, the definitions, axioms and postulates. Without grasping these first principles it is impossible to hit upon the correct middle terms. (Indeed even Aristotle's terminology suggests this: he uses the same term (*logos*) for 'term' and definition'. Avicenna's Arabic has the same ambiguity: *hadd*.)

Consider first the role of intuition (*noûs*) as the ability to grasp the middle term of a demonstrative syllogism. Aristotle describes a demonstration as a valid syllogism whose premises are true, primary and prior to its conclusion. Some premises will themselves appear as conclusions of prior demonstrations. Yet ultimately, Aristotle says, there will be *immediate* premises. Such premises will not appear as conclusions of any demonstration. That is, they are without mediation, without middle terms that could serve in the premises of yet prior demonstrations. [An. Po. I.2] *Noûs* (intellect) is the ability, Aristotle says, of grasping these immediate, primary principles. As I have already discussed, this amounts not only to grasping the common axioms and the postulates of the special sciences, but also to grasping the universals and their definitions. Both the axioms and postulates and the definitions are immediate and have no middle terms for demonstrating them. Once these are grasped immediately, the middle terms can be grasped, as these usually follow from definitions and other fundamental principles.

Along these lines, Avicenna says that intuition is the ability to hit upon the middle term. What is involved in

61. Al-Burhān 255, 5-8.

doing this? Take a standard example: the claim that man is risible has a demonstration. Being risible is a proper accident (*proprium*) of man, whose definition is 'rational animal'. 'Man is a rational animal' is an immediate premise. Being rational and being risible are commensurately universal in the sense of Posterior Analytics I.4. These two syllogisms are valid:

Everything rational is risible
Every man is rational
Therefore every man is risible

Everything risible is rational
Every man is risible
Therefore every man is rational

Yet only the former is a demonstration in the full sense.[62] It deduces the property of being risible from the real definition of a human being, from its constituent *differentia*, being rational. In contrast, the latter syllogism deduces, validly but improperly, a component of the real definition from a mere *proprium* of the subject.

From his scientific research Aristotle is well aware that sometimes we have commensurately universal attributes of a subject and may not have its real definition at all. Other times we may have a *proprium* and the real definition but not know which is which. He gives such examples. [An. Po. I.5-6; 13] Yet how are we to know when we have grasped the real definitions and the proper ordering of the attributes? Only then will we be able to construct complete demonstrations and to hit upon the correct middle terms.

62. Aristotle allows in Posterior Analytics I.13 for demonstrations like the latter (demonstrations of the fact (hoti)) when we do not have the real definition available. He views these at best as stopgaps. He has a similar view in I.14 about cases where the syllogistic form is other than Barbara (or Celarent). Here I ignore these other cases and focus on demonstrations of the reasoned fact (dihoti) of the Barbara form.

Now reconsider Avicenna's characterization of intuition as the ability to hit upon the middle terms. What must it involve? Finding the correct middle terms requires knowing the real definitions. We must be able to distinguish the constituents of these real definitions, the *genera* and *differentiae*, like rationality, from their inseparable attributes; both (1) the necessary ones, the *propria*, like risibility, and (2) the merely concomitant ones, those that belong to every instance but not necessarily—the standard example being that blackness belongs to every crow, although not *per se* and necessarily. [An. Po. 72b28-34] (1) In Avicenna's theory the *propria* have a necessary connection to the real definitions on the level of the quiddities *in re* although not on the level of quiddities in themselves.[63] We can hit upon the correct middle terms only if we know the real definitions so as to give their constituents priority over the *propria* by making the former and not the latter the middle terms. (2) The merely concomitant attributes can be distinguished from the constituents of real definitions in this way too. They also can be distinguished by noting that it is *possible* for there to exist *in re* quiddities of this type without having these attributes.

Avicenna seems to be hinting at these two distinctions when he says:

> [2] what is *per accidens* is extracted from every form, while [1] what is through the essence (per se) is abstracted.[64]

He goes on to say that perception brings Socrates or some man to the soul, except that it is a dispersed man mixed with accidents, not a pure man. Somehow then the intellect in us is able to pare away the accidents, both the

63. Avicenna distinguishes logical from physical necessity: 'Necessity' (and its cognates here) is ḍarūri, has the sense of strict logical necessity as opposed to the physical necessity signified by wajūb. Cf. Al-'Ibāra, ed. M. El-Khodeiri (Cairo, 1970), 119, 1-8; Al-Qīyās, ed. S. Zayed (Cairo, 1964), 166, 16; 168, 8-10; 169, 16; Al-Burhān 50, 15.

64. Al-Burhān 255, 11-2. Cf. Alexander, in Top. 421, 18-34.

common (2) and the proper (1) ones. Once it removes these, it obtains the abstract man. [256, 15-7] He then says that the intellect is an ability distinct from that of grasping the demonstration: "This power is the power of the contemplative intellect unknown in us, namely a sound, innate aptitude." [257, 8-9] How we can use this power without having it? Avicenna refers to his account of the storehouse of universals in the active intellect presented in his psychology. [257, 10][65]

What does it require for us to acquire knowledge of the real definitions? If we start from what is most familiar to us, the sights and sounds of sense perception, we must proceed via induction and abstraction to knowing the universals and their relations to each other. Once we know the hierarchy of universals, we will know which are under which, which are species, genera, *differentiae* and *propria* of which. But how do we sort out and exclude (2) the merely concomitant attributes? For Avicenna this amounts to distinguishing features of quiddities *in re* from those of quiddities in themselves. How to do that? How do we know, say, that living within the solar system is a merely concomitant attribute of a human being, even though all human beings have had (and probably will have) that attribute? Because somehow we know that it is *possible* for a human being to live in another galaxy. Insight into quiddities in themselves (and *in re*) make it possible for us (2) to separate off the merely possible, concomitant attributes from the necessary ones—and even (1) to give order of priority amongst equally necessary attributes.

Now it is a fact that we do separate them off, via such modal claims, about which attributes it is possible for something to lose and still remain and about which attributes it is necessary for the thing to have if it is to remain. We have this ability to make these modal distinctions. We do not have to insist that we are infallible in making these dis-

65. Cf. Fī Nafs 190, 13ff.; 209, 4ff.; 219, 4-6.

tinctions, although in the excitement of discovery and in presenting our own attempts, we indeed tend to do so. The more fundamental issue consists in: how is it possible for us to make such distinctions at all?

Avicenna offers an answer: by means of dialectic and intellectual purification it is possible for us to have intuitions of quiddities in themselves. Somehow the active intellect in us thereby gains direct contact with the "storehouse" of universals, the quiddities in themselves.[66] This storehouse constitutes the content of a universal active intellect or world soul. Acquaintance with it makes it possible to separate the essential, necessary attributes from the merely necessary and from the merely concomitant attributes.

The middle ventricle of the brain is the organ of thinking—of our thinking.[67] Here we can abstract and analyze material given from sense perception. Yet how to go beyond that to separate out the necessary from (2) the merely but permanently concomitant attributes, and the prior from (1) the posterior necessary attributes? In fact we do so. But the process goes beyond the natural operations of the human animal. Hence we can see how Avicenna came to postulate a super-natural activity of the intellect, which would not depend on the existence of the human animal.[68]

We abstract, or separate off, (2) the merely concomitant from what is physically necessary (wajūb) for the quiddity to exist *in re*, namely, from the *propria* and the constituents of the definition. We separate off (1) its *propria* from the constituents of its definition as not being logically necessary (*ḍarūri*,). (In later terms the distinction between (1) and (2) is that between the analytic and the synthetic *a priori*.) We can make both abstractions if we can apprehend the hierarchy of quiddities in themselves—via intuition. These quiddities do not seem to lie in the human intellect. Otherwise we would be able to obtain knowledge far easily. Still, in order for us to make such abstractions, we must somehow have access to these quiddities in themselves. Avicenna has already established the existence of a God, a necessary being, with an intellect able to think and actualize possible beings. Hence he concludes that these quiddities are stored in the pure, divine active intellect.

66. Hasse, "Avicenna on Abstraction, " p. 48 nn. 38-44: Gutas, "Intuition, " p. 12; Fī Nafs 58, 4.
67. Gutas, "Intuition, " pp. 9-10 for the texts.
68. This doctrine of course has many antecedents in Neo-Platonism. Even Aristotle's cryptic remarks about the active intellect in On the Soul III.5 might suggest it.

As Gutas has stressed, Avicenna separates out the mental operations of thinking [*fikr*] and intuition (*hads*). Thinking concerns our apprehension of the middle term; intuition is "a divine effluence and an intellectual contact taking place without any act of acquisition at all".[69] Thinking requires effort on our part over time, while; intuition comes of the essential order of the intelligibles comes to us at once without effort. Avicenna recognizes conceiving (taṣawwur) as well. This involves thinking of the forms via abstractions from sense perceptions.[70]

Avicenna has a complex account of how these mental abilities operate and interact in us.[71] Here let me merely suggest here how they fit. Intuition consists in our having access to the activity of the impassive, divine active intellect, serving in us as the light of reason. [An. 430a17-25] Thinking is the operation of the active intellect in us. Conceiving is the operation of abstracting the universals from sense perceptions. The imagination (*taṣayyul*) serves as the bridge between our experience and the storehouse of forms contained in the divine active intellect.

> When the soul has reached a sublime stage, acquired the excellent [sacred] faculty, and separated from the body, it attains whatever is attained. There, where all

69. Avicenna, Al-Mubāḥathāt §236, trans. Gutas, p. 15.
70. AL-Burhān, 255, 20-1; cf. Goichon, Lexique s.v. *taṣawwur*.
71. See Allan Bäck, "Imagination in Avicenna and Kant."

> distractions are vanished, faster than through intuition, the intellectual world presents itself to the soul according to the order of the terms of propositions and according to the essential, not temporal order of the intelligibles..."[72]

Perhaps Avicenna's account has more poetry than scientific detail in it. Certainly he also derives from it spiritual, eschatological, and mystical significance as well. Yet at the least he does recognize the phenomena—those involved in hitting upon the middle terms of demonstrations—and is attempting to explain them.

On this interpretation Avicenna has but a single theory of intuition. His later views of intuition follow from working out and revising some of the details of what is required for us to have complete demonstrations. Also he would be following out and filling out Aristotle's sketchy doctrines on how *noûs* acquires first principles. The storehouse imagination and intuition are components of his attempt to flesh out how imagination enables us to grasp the universal. Aristotle himself makes some hints pointing towards such a doctrine.

This view of Avicenna makes him more into a follower of Aristotle than of Plato, as he himself states. It also makes Al-Burhān an insightful commentary into Aristotle's Posterior Analytics. But I have already said that.[73]

Avicenna's Fallibilism

Like Aristotle, Avicenna has his moments of omniscience: he is an elitist *par excellence*. In his early Compendium on the Soul he speaks of acquiring knowledge by divine inspiration and revelation, either directly or indirectly via syllogisms.[74] By the time of the Shifa', he thinks that the intelligibles are grasped only when the middle terms of the appropriate syllogisms are obtained.[75] These can be had by instruction or by direct intuition, via contact with the divine active intellect. Avicenna holds that people vary in the degree to which they possess the power of intuiting—and that he has it to the utmost. Such as he is a true prophet, whose authority however does not come from his own self-proclamations but rather from the middle terms that he provides for demonstrations: these can be checked by all. Avicenna continues to maintain this position in his later works.[76]

Despite all this, even Avicenna seems to admit the chance of his intellectual insights erring. After all, he finds errors in Aristotle and Al-Fārābī—and these philosophers, at least, he admires. One who did not have the intuitive power in the highest degree might think, erroneously, that she did. One might have false intuitions. Commenting on Posterior Analytics II.13, Avicenna remarks that it is easy to commit the fallacy of homonymy when trying to get at the universal from the particulars. He uses the example of Alcibiades, and says that fallacy occurs frequently.[77] Luckily, to avoid error, we have demonstration and logical standards to check the insights descending upon us. This might explain why Avicenna insists that intuition and contact with the divine intellect provides middle terms and not oracular pronouncements.

Avicenna asks how error occurs. He says that intuition makes contact with the intelligibles possible

> in order to bring forward definitions and to form concepts of them, and in order to bring forward the middle (terms). But the function of combining is up to it and sometimes it does (it) well as sometimes badly.[78]

So then, if we put aside his moments of intellectual

72. Avicenna, al-Mubāḥathāt §467, trans. Gutas, Avicenna, p. 15.
73. In "Avicenna The Commentator," in Medieval Commentaries on Aristotle's Categories, ed. Lloyd A. Newton (Leiden, 2008).
74. Compendium on the Soul §§2-4, trans. Gutas, Avicenna, p. 161.
75. Al-Najāt 272, 3-274, 4 [as Gutas notes: repeating Fī Nafs].
76. See the texts translated by Gutas, Avicenna, pp. 163-6; "Intuition."
77. Al-Burhān 243, 1-15.
78. Avicenna, al-Mubāhathāt §595, trans. Gutas, "Intuition," p. 19.

intoxication and the hyperbolic style of his culture, Avicenna sounds a lot like Aristotle. Intuition cannot err in grasping what it grasps: the quiddities in themselves—as well as, apparently, their relation to each of in a hierarchy like a Porphyrian tree. Yet when it comes to construct premises, by combining the terms signifying these quiddities, by mental acts, it can err. Notice that, in Avicenna's theory, propositions exist in the mind and not in themselves or in the divine active intellect. Perhaps error arises once the quiddities enter the merely human mind and are then formulated into mental propositions. Avicenna locates these faculties of the human mind in different parts of the brain.

Avicenna's Demonstrative Science

Avicenna then has a metaphysics of essences. The various types of propositions in Aristotle's demonstrative science have their grounds of truth at different niches in the threefold distinction of quiddity.

The demonstrations themselves, when perfect ones of the reasoned fact (dioti), deduce conclusion predicating *propria* of their subjects from the first principles: definitions, axioms, postulates and prior theorems. The connection between the *propria* and such premises has its basis on the level of quiddities *in re*.

Where does Avicenna locate the first principles? Like Aristotle he has concepts in the mind coming via abstraction from the sense perceptions of objects, of the quiddities existing *in re*. The concepts themselves are the quiddities in the mind. Such concepts contain all the features common to what has been perceived. How then to purify them so as to exclude the merely contingent features, holding of every cases perceived but not necessarily and essentially? To do this, we have to get at their real definitions. Abstraction here does not suffice. Here enters intuition.

(1) These purified concepts serve as the terms used in demonstration

(2) The real definitions have their truth-makers on the level of quiddities in themselves in their hierarchical structure. Intuition of the hierarchy enables us to see the relationships between those quiddities. The combination of animality with rationality yields humanity.

(3) The common axioms like the principle of non-contradiction present more difficulty. These seem fundamental for Avicenna: his doctrines about possibility and necessity assume them. Still it seems hard to ground a principle like "the same attribute cannot at the same time belong and not belong to the same subject in the same respect" [Metaph. 1005b19-20] on the relationships holding between quiddities in themselves. Such a principle does not seem to depend on a simple combination of genus and *differentia*. More fundamentally, it does not contain categorematic terms of first intention like 'animal', but rather those of second intention like 'attribute'. Yet, even if we might be able to abstract second intentions like 'attribute' from quiddities in the mind, it seems impossible to abstract the principle of non-contradiction thus. Aristotle does not say much about the truth-makers for these axioms either, except that we ought to presuppose them. I hazard the following guess: Such logical principles serve as laws of reasoning for the active intellect as well as for the combination of quiddities. They serve as the laws of nature. (Leibniz will do the same with the principle of non-contradiction and the principle of sufficient reason.)

The Intuition of Essences Today

Talking of apprehending the real essences of physical objects seems silly to many scientists today, indeed, almost

"metaphysical". Yet, once we update the terminology, we shall see that modern science has a similar position.

Today scientists and even philosophers describe their work often as giving mere models, ones useful for us. They say that they are avoiding the pretension of describing reality itself. On the other hand, they act *as if* the well-entrenched models describe reality accurately. Science is taught thus, and much real money is invested in developing technologies based upon such theories: electricity; nanotechnology; quantum computers; supercolliders. If we take the pragmatic standpoint, it seems that, given that we act *as if* these things are real, talk about them existing, and commit ourselves to acting accordingly, we are committed to maintaining them to have real existence. (Perhaps the model talk has as one of its primary functions just to announce a disinclination to engage in philosophical conversation.)

Still admitting all this does not by itself suffice to get modern scientists admitting to real definitions, the formulae of the essences, of quiddities in themselves. But look again at current scientific practice. Chemists think that they understand what it is to be copper: an element with 29 protons. This captures the true nature of copper—even though, if something is copper, it has many other necessary features: conducting electricity and being ductile under certain conditions of temperature, pressure etc. Somehow they are able to isolate this atomic description of the nature of copper as privileged, as in the theory it is the cause for copper having those other necessary properties. How? In developing their theory they have found it to work out better if the atomic number of copper is taken as more fundamental and having causal priority. Like Aristotle and Avicenna, they are groping towards the real definitions, the constituents of the quiddities in themselves.

Again, scientists routinely disregard many features as merely accidental. Despite the fact that all experiments

have been carried out within a single solar system, their results are supposed to hold for the entire universe. What sort of sample size do we have? How do we know that this feature is irrelevant? Indeed, we assume so, with an air of certainty and infallibility—until we are proved otherwise. After all, the Earth is a moving reference frame and so the measurements of length, weight and time on it are distorted according to our current theory of relativity—although the differences are too small for most of our instruments to measure. However my point concerns the fact that we make such judgments. What is required, what must be presupposed, in order to be able to make a judgment that certain universal features of objects are merely concomitant—and even more that some necessary features are more central than and primary to others? Something like Avicenna's doctrines concerning quiddities in themselves and quiddities in things.

Still how to explain Aristotle's—and Avicenna's—claim that noûs, science, phronesis and wisdom cannot be deceived? Perhaps Aristotle means to say that this infallibility is but an ideal for us: beginning with the indistinct universals of sense perception, we start with what is not evident in itself but rather confused, and work towards this idea. [Metaph. 1029b1-12] That is, *noûs* as such may be infallible but not the *noûs* in us.[79] After all, Aristotle recognizes that there were many scientists before him, and claims that most of them were wrong in most of their claims. Note that he might be saying mostly that *noûs*, as it gives us the primary principle, is the most senior and most certain of what knowledge we have [100b8-13] Indeed, Aristotle classifies *noûs* among those faculties that can be in error—at any rate, as far as we can know. [An. 428a3-6] Perhaps the best way for us to check on the accuracy of our apprehen-

79. Cf. the different types of *noûs* distinguished at An. III.5 and in the later Aristotelian tradition. Cf. Dag Nikolaus Hasse, Avicenna's De Anima in the Latin West: The Formation of a Peripatetic Philosophy of Soul 160-1300, (London-Turin, 2000)

sion of first principles, for Aristotle as well as for us today, lies in working out their full articulation in demonstrative science and then checking the claims being made with our experience.[80] Likewise we have seen Avicenna presenting the fallibility of demonstrative science as if it is his own view.

Scientists today do no better. We have it being asserted in Newtonian science as necessary truth that spatial and temporal features are invariant and have an absolute status. Until Poincaré showed otherwise, an isolated planetary system with three bodies in motion was thought to be a deterministic, stable system and putting an observer at the end of a pool table was thought to have a negligible effect upon the caroming of the balls. Until quantum physics prevailed, it was asserted that necessarily every event has a cause. Until fractal geometry it was considered (logically?) impossible to have a finite area with an infinite perimeter. Yet, despite thee pronouncements, the scientific tradition remained flexible enough to recognize its fallibility and accept these changes—modify its paradigms if you will. Remember how rare such flexibility is and how common dogmatism is in the world!) Given that Aristotle and Avicenna figured prominently in constituting the scientific tradition, it would not be surprising to find them too remaining flexible.

80. Cf. Hempel's D-N method. This would bridge the gap that Michael Ferejohn, The Origins of Aristotle's Science, pp. 4-5, sees between the method of scientific explanation developed in the bulk of the Posterior Analytics and the intuitionist, quasi-Platonist grasp of first principles by *noûs* in its last chapter. Cf. David Charles, Aristotle on Meaning and Essence, Ch. 6; pp. 265-6 how the first principles are known and how they become known as starting points.

Deus como causa final na *Ilahiyyat* da *shifa'*, de Avicena

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Quando se trata do tema da causalidade e da emanação em Avicena, os comentadores[2] que acentuam o neoplatonismo de Avicena têm a tendência de frisar em seu sistema o papel dominante da causa eficiente, na medida em que é característica da teoria da emanação identificar Deus como essa causa relativamente a seu papel na existência do mundo, e não como causa final de seu movimento[3]. No entanto, Avicena não apenas afirma que a causa final tem precedência à causa eficiente, mas afirma que a investigação da causa final é a parte mais nobre da

1. Desenvolvido no interior do projeto CNPq "Causalidade e emanação em Avicena".

2. MARMURA. The Metaphysics of Efficient Causality in Avicenna (Ibn Sina). In: MARMURA (Ed.). *Islamic Theology and Philosophy: Studies in Honor of George F. Hourani*, New York: State University of New York Press, 1984: 172-187; COLISH. Avicenna's Theory of Efficient Causation and its Influence on Aquinas. *Tommaso d'Aquino nella storia del pensiero*. Atti 1974. Napoli, 1975. I:296-306; OWENS. The Relevance of Avicennian Neoplatonism. In: MOREWEDGE (Ed.). *Neoplatonism and Islamic Thought*, Albany: State University of New York Press, 1992: 41-50; NASR. *An Introduction to Islamic Cosmological Doctrines: Conceptions of Nature and Methods Used for its Study by the Ikhwan Al-Safa, Al-Biruni and Ibn Sina*. New York: SUNY, 1993.

3. Quanto à análise das causas material e forma em Avicena, ainda há poucos estudos. Para a bibliografia disponível e uma perspectiva para o tratamento do tema, ver BERTOLACCI. The doctrine of Material and Formal Causality in the "Ilahiyyat" of Avicenna's "Kitab al-Šifa'". *Quaestio* 2, 2002: 125-154.