

Aristotle's Notion of Experience

Gregorić, Pavel; Grgić, Filip

Source / Izvornik: **Archiv für Geschichte der Philosophie, 2006, 88, 1 - 30**

Journal article, Published version

Rad u časopisu, Objavljena verzija rada (izdavačev PDF)

Permanent link / Trajna poveznica: <https://urn.nsk.hr/urn:nbn:hr:261:559076>

Rights / Prava: [In copyright](#)/[Zaštićeno autorskim pravom.](#)

Download date / Datum preuzimanja: **2025-01-23**



Repository / Repozitorij:

[Repository of the Institute of Philosophy](#)

Aristotle's Notion of Experience

by Pavel Gregorić and Filip Grgić (Zagreb)

Abstract: Aristotle's notion of experience plays an important role in his epistemology as the link between perception and memory on the one side, and higher cognitive capacities on the other side. However, Aristotle does not say much about it, and what he does say seems inconsistent. Notably, some passages suggest that it is a non-rational capacity, others that it is a rational capacity and that it provides the principles of science. This paper presents a unitary account of experience. It explains how experience grows from perception and memory into a rational capacity, and in what way it provides the principles.

1. *The Problem with Aristotle's Notion of Experience*

"The first to arrive at a definition of experience," wrote W. H. Heinemann, "seems to be Aristotle"¹. This is a bold statement in at least two respects. First, it is questionable whether Aristotle ever produces a definition of experience. He says various things about experience, most extensively in the first chapter of the first book of *Metaphysics* (*Met.* A.1) and in the last chapter of the second book of the *Posterior Analytics* (*APo.* II.19), but he never defines it. Had he defined it, his notion of experience might have been easier for us to understand. Second, if one takes 'definition of experience' in a wide sense of saying something determinate about the character and utility of experience, Heinemann's statement is dubious in the light of our evidence of discussions of experience that predate Aristotle.

Some Hippocratic treatises², denouncing the idea that medicine should be based on philosophical hypotheses, stress the role of experience in formulating medical theories, as opposed to untestable philosophical speculations. Some pre-Socratic philosophers seem to

¹ Heinemann 1941, 562. Heinemann quotes *Posterior Analytics* II.19 103^a3-9 to support his claim.

² *De Vetere Medicina* and *De Natura Hominis*, in particular.

have associated experience with memory and counted it among the characteristically human achievements.³ Both Plato and Aristotle suggest that the sophist Polus of Acragas contrasted the pair experience-inexperience with the pair art-chance.⁴ In the *Gorgias*, Plato drives a wedge between experience and art. While art carries insight into the nature of its object and into the cause of its procedures, experience affords no such insight, for it relies entirely on the memory of what usually happens. What this enabled Plato's Socrates to do is to disparage rhetoric as mere experience.⁵ Similarly, the distinction between slave and free doctors in the *Laws* rests on the fact that the former rely on experience, whereas the latter have a systematic knowledge which enables them to teach their apprentices and give accounts of their procedures to the patients.⁶ Elsewhere in Plato references to experience are not so sharply contrasted with art, and they tend to be more positive.⁷

What distinguishes Aristotle's treatment of experience is that he seems to be the first one to give it a fixed place in the hierarchy of cognitive capacities and dispositions. This would suffice for Heinemann's enthusiastic conclusion that "[t]his Aristotelian restriction of experience to its intellectual meaning and its connection with science and *technē* has continued up to now to influence the treatment of the problem"⁸. For Aristotle, experience fills a wide gap between the non-rational cognitive capacities of perception and memory on the one side, and the rational cognitive dispositions of art and science on the other side. More precisely, Aristotle maintains that experience comes about from perception and memory, and that art and science in turn come

³ See Anaxagoras fr. B21 (Diels-Kranz) *apud* Plutarchus, *De fortuna* 98F; Democritus fr. B5 (Diels-Kranz) *apud* Diodorus, *Bibliotheca historica* I.8.7-8.

⁴ Plato, *Gorgias* 448c5-7; Aristotle, *Metaphysics* A.1 981^a4-5. There is a significant difference between what Plato and Aristotle make Polus say. The Platonic Polus says that experience makes our life proceed in accordance with art, and inexperience in accordance with chance. The Aristotelian Polus says that experience produced art, and inexperience chance. There is no reason to suppose that Aristotle did not have direct knowledge of the work of Polus; cf. Renehan 1995.

⁵ *Gorgias* 462b3-463b6, 500e3-501b1.

⁶ *Laws* 720a2-e5, 857c5-e1.

⁷ See, e.g., *Protagoras* 320b, 341a; *Republic* 484d, 582a, 584e; *Philebus* 55e, *Laws* 720a-e.

⁸ Heinemann 1941, 562, Heinemann's italic.

about from experience. However, it is far from clear what sort of disposition experience is, according to Aristotle, how it comes about, and how it yields art and science. This is what we shall try to elucidate in this paper.

We shall start by pointing out one acute and largely unacknowledged difficulty with Aristotle's notion of experience. This will allow us to set out some preliminaries and give an outline of our approach which aims, among other things, to solve that difficulty. The difficulty is the following: when Aristotle relates experience to memory, it seems to be a non-rational disposition which is partially attainable to some non-rational animals. When related to art or science, experience seems to be a full-blown rational disposition which is characteristic of human beings. But how can there be one single cognitive capacity or disposition which is both non-rational and rational?

There are two main pieces of evidence for thinking that experience is non-rational. First, nothing in Aristotle's texts suggests that the emergence of experience from memory requires any rational activity. 'Many memories of the same thing' (*Met.* A.1 980^b29-981^a1), or what seems to be equivalent, 'frequent memories of the same thing' (*Apo.* II.19 100^a4), appear to be both necessary and sufficient for the generation of experience.⁹ Memory itself is a non-rational capacity, as Aristotle explains in *De Memoria et Reminiscentia* 1, and if its repeated exercise brings about experience, this experience should also be non-rational. Second, Aristotle says that some other animals have a share in experience, if only to a modest degree (*Met.* A.1 980^b25-27). If some non-rational animals indeed have a bit of experience, this bit of experience has to be non-rational.

On the other hand, there is a number of passages which suggest that experience is rational. We shall pick out only two. One is that Aristotle speaks of 'thoughts of experience' (τῆς ἐμπειρίας ἐννοήματα) and says that having certain judgements is a matter of experience (*Met.* A.1 981^a5-9). This seems to imply that experience operates with rational contents such as thoughts and judgements, so it has to be rational. The other passage comes from the *Prior Analytics*, where Aristotle says that "it is for our experiences concerning each subject to provide the

⁹ All translations from the Greek are ours unless otherwise indicated.

principles” (I.30 46^a17-18).¹⁰ It is hard to believe that a non-rational capacity or disposition could provide the principles of the highest rational capacity. Hence, experience must be rational.

One way to tackle the problem is to truncate the notion of experience and admit only its rational aspect. This would require rejection of the evidence to the contrary. For example, one could argue that when Aristotle speaks of ‘many memories of the same thing’, he is talking about human beings, so that it is only in rational beings that many memories of the same thing can bring about experience. While we would agree that the story of the emergence of experience in *Met.* A.1 and *APo.* II.19 is focusing on human beings, this does not imply that experience is rational. For Aristotle, human memory is no more rational capacity than that of other animals,¹¹ and he makes no suggestion that there are additional conditions on repeated memory of the same thing for the generation of experience. As for our second piece of evidence to the contrary, one would have to show that experience does not belong to non-rational animals.¹² However, in that case it would be extremely difficult to explain intelligent behaviour of animals, of which Aristotle gives an extensive record in *Historia Animalium* IX.

Assuming that this way of tackling the problem is inadequate in the light of evidence for a non-rational aspect of experience, we shall try a different solution. Instead of truncating the notion of experience, we shall attempt to preserve its unity. We will offer an account in which experience ranges from a modest non-rational achievement that comes about from perception and memory, to a rich rational achievement which is necessary for art and science. We shall base our account primarily on *Met.* A.1, for it seems less problematic than *APo.* II.19: it is beset with fewer textual difficulties, it is less prone to employing vague expressions, and it is furnished with examples. Once we extract available information concerning Aristotle’s notion of experience from

¹⁰ Transl. Smith 1989. Cf. *EN* VI.8 1142^a18-19: “[T]he first principles of these other [viz. ethical] subjects come from experience.”

¹¹ Cf. *De Mem.* 1 450^a15-25.

¹² Alexander of Aphrodisias (*In Met.* 4.13-16 Hayduck) claims that Aristotle meant either that other animals have no experience at all, or that they have something analogous to it. However, that is not what Aristotle actually says. To be sure, Aristotle does say in *HA* VIII.1 588^a29-30 that non-rational animals have something analogous to τέχνη, σοφία and σύνεσις, but he neither says nor implies that they have something analogous to ἐμπειρία.

Met. A.1, we shall be in a better position to understand Aristotle's account of how experience leads to art and science in *APo.* II.19.

2. Cognitive Hierarchy and the Place of Experience

Met. A.1 opens with the famous statement that all human beings by nature desire to know (980^a21). This grand opening is supported by the claim that we love the senses independently of their practical use, as is shown by the example of sight: even when there is nothing to be done, we choose to look at things. The reason is that we gain more knowledge of the world through sight than through the other senses.

The senses are the only cognitive capacities animals have from birth. Some animals have no cognitive capacity or disposition other than the senses. Other animals are endowed also with memory, a capacity which emerges from perception and enables them to store and retrieve what they have perceived. Such animals are said to be cognitively superior to those without memory. They are not tied to the present, but also have an awareness of the past, which enables them to behave intelligently. Provided that they have the sense of hearing in addition, they can even learn certain things, either from each other or from human beings.¹³ So, in some animals, memory emerges from perception, and allows them to have more knowledge than animals without memory.

Non-rational animals' knowledge of the world is confined to perception and memory.¹⁴ In rational animals, however, "experience comes about from memory; for many memories of the same thing bring about the power of one experience" (980^b28-981^a1). We shall offer a detailed interpretation of these lines below. For our immediate purpose it will suffice to conclude that experience, under certain conditions, is developed from memory. Also, experience seems to afford more knowledge than memory and perception, for "experience seems to be very similar to art and science" (981^a1-2). Aristotle's remark about the similarity of experience with art and science is reminiscent of the *Gorgias* (463b3-4). However, unlike Plato, who is content to show only that these are in fact quite different cognitive achievements, Aristotle

¹³ Cf. *HA* IX.1 608^a17-21.

¹⁴ As already noted, in 980^b26-27 Aristotle seems to concede a limited share in experience to non-rational animals. What this amounts to will be discussed later.

also claims that art and science, under certain conditions, are *developed* from experience. This claim is supported in 981^a3-12.

Aristotle explains that “art comes about when one universal judgement about similar things is produced from many thoughts of experience” (981^a5-7). From the examples of judgements of experience and art (981^a7-12) we learn that judgements of art include certain universal items, items which are found in a number of different subjects. Later on (981^a28-30) we are told that art is a disposition on the basis of which one knows why something is the case. From this we can infer that the universal items included in judgements of art are explanatory items, and that art is therefore a disposition to know explanatory items. More precisely, art is a disposition to know the relevant explanatory items in a domain for the purpose of production (ποίησις), whereas science is a disposition to know the relevant explanatory universals in a domain for the purpose of study (θεωρία).

These explanatory items cannot be grasped by the senses (at any rate not directly and not *qua* explanatory), yet they are at least as real as the perceptible particulars in which they exist. In other words, the explanatory universals are part of the inventory of the world. Hence, those who have art or science know certain things in the world which cannot be known by other means, things which are helpful for successful production and essential for scientific study. And not only do they know a wider range of things in the world, but their knowledge is of a superior sort. The relevant explanatory items are causes of certain things, their presence in things explains why these things are what they are and behave in the way they typically do. Hence, the relevant explanatory items enable us to understand things, and understanding is the most superior type of knowledge.

Before we look more carefully at the passage dealing with experience, let us draw a general conclusion about the first part of *Met. A.1* (980^a21-981^a12). Roughly speaking, the soul is organised in such a way that lower cognitive capacities, provided certain conditions, cause the realisation or acquisition of higher cognitive capacities or dispositions. Every higher cognitive capacity or disposition affords superior knowledge of the world. Consequently, the highest cognitive capacity will afford the most perfect knowledge of the world. Having established in *A.1* that wisdom is knowledge of certain causes and principles (982^a1-3), in the first part of *A.2* (982^a4-^b10) Aristotle specifies that it is

knowledge of the *first* causes and principles.¹⁵ Thus we learn that the highest cognitive capacity, wisdom, is theoretical knowledge of the first causes and principles. What seems to follow from all this is that the natural human desire to know, which is manifest at the lowest level in the love of the senses, is ultimately fulfilled in the understanding of the first causes and principles. Although this important consequence is clearly on offer to careful readers of *Met.* A.1-2, it is not made explicit in the *Metaphysics*.¹⁶ This seems to suggest that the first part of *Met.* A.1 was composed with a different purpose in mind.

The main purpose of the first part of *Met.* A.1, we would argue, is to introduce various cognitive capacities and elucidate how they differ. This is crucial for Aristotle's arguments in support of his main thesis in *Met.* A.1, namely that wisdom is knowledge of certain causes and principles.¹⁷ There is solid evidence that Aristotle took this thesis from Plato,¹⁸ and his going at great length to prove it can be seen as a tribute to Plato.

Aristotle's arguments in support of the thesis are dialectical. He picks out instances of the noun 'wisdom' (σοφία) and the cognate adjective 'wise' (σοφός) where they are used in ways which indicate that wisdom is indeed knowledge of

¹⁵ We are inclined to follow Ross and Jaeger in thinking that the remark in A.1 981^b25-29 was added into the text at a later point, probably by Aristotle himself. Apart from referring to *EN* VI, it anticipates the conclusion of A.2 that wisdom is knowledge specifically of the *first* causes and principles.

¹⁶ A similar conclusion is drawn in the *Protrepticus*, following an argument which is very similar both in form and content to the one found in the opening paragraph of *Met.* A.1; cf. Iamblichus, *Protrepticus* VII, 43.20-45.3 (Pistelli) = Aristotle, *Protrepticus* frs. 6-7 (Walzer, Ross), frs. B70-77 (Düring). This parallel between *Met.* A.1 and the *Protrepticus* is Jaeger's main piece of evidence for claiming that "the famous introduction to the *Metaphysics* is in essence nothing but an abbreviated version of his classical exposition of the matter there [viz. in the *Protrepticus*]. [...] We find that the introductory chapter of the *Metaphysics* is simply a collection of material extracted from this source for the purpose of a lecture, and that it is not even quite firmly cemented into place" (Jaeger 1948, 69).

¹⁷ Cf. 982^a1-2.

¹⁸ The central books of Plato's *Republic* may be interpreted as expounding this thesis. Doxographic evidence is more straightforward on this score: "In a special sense [Plato] considers wisdom to be the science of objects of thought and real existents, the science which he says is about god and soul separate from the body" (Diogenes Laertius, III.63). In the collection of definitions which was presumably compiled by members of the Academy in the late fourth century BC, we find the following definition of wisdom: "knowledge which contemplates the cause of beings" (*Def.* 414b5).

certain causes and principles.¹⁹ The most thoroughly discussed instance (981^a12-^b6) is the one concerning the distinction between experience and art. Although they do not differ as far as production is concerned – in fact, Aristotle observes at 981^a21-23, experience without art is more successful in production than art without experience – yet the person informed by art is considered *wiser* than the person informed only by experience. This is explained with reference to knowledge of the cause. The person informed only by experience knows merely *that* something is the case, whereas the person informed by art knows *why* something is the case. So art is called ‘wise’ not because it is productive, but because it knows the causes inherent in its subject-matter and has an account of its procedures (981^b5-6). This is one argument, then, that wisdom is knowledge of certain causes.

3. Primitive Experience

Now we understand why Aristotle discusses experience in the first part of *Met.* A.1, and why he discusses it the particular way he does. On the one hand, experience is a cognitive disposition which emerges from memory and which in turn gives rise to art and science. As such, it is part of Aristotle’s survey of cognitive capacities and dispositions in their natural order. On the other hand, it is a productive disposition of importantly different cognitive import than art. As such, it plays a role in Aristotle’s first argument in support of his main thesis in *Met.* A.1. From this argument we learn that the crucial difference between experience and art is that the latter knows the causes, and the former falls short of that knowledge. Now, if the person who has experience does not know the cause and the *why* of something, what does she know? We have seen that she knows only *that* something is the case. However, that cannot be the whole story. Let us explain why.

In the rest of the chapter, Aristotle mounts the remaining four arguments supporting his main thesis, that what is generally referred to as ‘wisdom’ is in fact knowledge of certain principles and causes. In the third argument (981^b10-13) he says that none of the senses is identified with wisdom, although they provide the most authoritative knowledge of particular things.²⁰ “But they do not tell us the *why*

¹⁹ An exception is the second argument (981^b7-10), in which Aristotle does not infer from the use of the noun *sofi9a* or its cognates. He argues that the ability to teach is an indication of knowledge; since art does and experience does not confer this ability, art is more truly knowledge (*επιστήμη*) than experience.

²⁰ The remaining three arguments are the following. The second argument (981^b7-10) is based on the ability to teach as an indication of knowledge, and that ability

of anything,” Aristotle adds, “for instance, why fire is hot; only *that* it is hot”. So, the senses and experience both enable one to know *that* something is the case, while neither enables one to know *why* that is the case.²¹ This seems to suggest that there is no difference in what one knows on the basis of the senses only, and what one knows on the basis of experience. If that were correct, however, Aristotle would have no justification for ranking experience above the senses. But we have seen that experience is a higher cognitive achievement which presupposes memory in addition to the senses. Non-rational animals have only a modest share in it, whereas in rational animals it brings about art and science. Hence, we must suppose that one knows more, arguably much more, on the basis of experience than on the basis of the senses only. Saying that experience enables one to know *that* something is the case, therefore, cannot be a complete answer to the posed question.

To get closer to a more adequate answer, let us consider the lines 980^b28-981^a1 quoted earlier:

In human beings experience comes about from memory; for many memories of the same thing bring about the power of one experience (αἱ γὰρ πολλαὶ μνήμαι τοῦ αὐτοῦ πράγματος μᾶς ἐμπειρίας δύνανται ἀποτελοῦσιν).

There are several problems here. What is ‘the same thing’, and what does it mean to have ‘many memories’ of it? What is ‘one experience’, and what is its ‘power’? We shall deal with these questions one by one, and that should provide us with a provisional explanation of Aristotle’s claim that experience is superior to perception.

The Greek word *πᾶγμα*, like its English counterpart ‘thing’, is often used as a blanket-term for items very different in kind. In Aristotle, it frequently refers to medium-sized physical objects, but it can also refer

is said to come only with art, not with experience. The fourth argument (981^b13-17) is based on a connection between wisdom and superior insight, which is evident from the common practice of calling the discoverer of any art ‘wise’. The fifth argument (981^b17-25) is based on a particular view of historical development according to which the later in time an art or science is discovered, the wiser it is. The consequence is that the wisest science – i.e. wisdom itself – will be discovered last, and that is the science Aristotle is seeking in the first book of *Metaphysics* (for ἡ ζητούμενη ἐπιστήμη and similar formulas, see A.2 982^a4, ^b8, 25, 31, 983^a21, 22).

²¹ The same point about perception is made, for instance, in *APo.* I.31 87^b39-88^a8.

to actions, events, states of affairs, and facts.²² For a start, we shall proceed on the most conservative assumption that ‘the same thing’ (τὸ αὐτὸ πρᾶγμα) is a medium-sized physical object, say a particular table, that remains numerically identical through time. To clarify our position, let us suppose that there is a person in a room with the table, call him John. (1) Although John is not particularly interested in tables, over time he has perceived the table by looking at it and touching it. Every time he did so, his perceptions left traces in his soul, and some of these traces are stored and can be retrieved by John. This is roughly what constitutes memory according to Aristotle in the *De Memoria*, so there is a sense in which John has many memories of the same thing. However, it is unlikely that Aristotle would say that John has experience of the table. To have many memories of the same thing in this sense, it is entirely sufficient to have the senses and memory, and there is no reason to deny this to a number of non-rational animals.

What more can John do to gain experience of the table? (2) He can use his senses not only to perceive that the table is brown, smooth, and square, but also to observe other kinds of facts about the table. For instance, that it is stable, that it is made of wood, that it has four legs, that its legs are diagonally fastened by two crosspieces, that its parts are fastened together with bolts, etc. If John has observed a sufficient number of such facts about the table, and if his observations are in some way stored and capable of being retrieved, there is a sense in which he has many memories of the same thing. Now, is that sufficient for the generation of experience? Nearly, we believe, but not quite.

We can envisage a case in which the observed facts about the table are stored and retrieved only disconnectedly or at random. John might be disposed to retrieve the previously observed and stored facts about the table only when thinking of other things, and failing to do so when thinking of the table. For instance, he sees a tree, and it occurs to him that the table he perceived earlier is made of wood; he encounters a man walking with crutches and remembers that the table has four legs; but when he looks at the table, he is not inclined to think of these and other facts about the table, the facts he has observed in the past and stored in

²² See, for instance, *Met.* D.30 1024^b17-20; *EN* II.4 1105^b5, *Phys.* IV.14 223^b25, VIII.8 263^a17, *Rhet.* I.1 1354^a28. In *De Int.* 7 17^a38 ff. Aristotle makes it clear that universals as well as particulars can be called πρᾶγματα.

memory. (3) It seems that experience requires that the observed and stored facts be retrieved in connection with the thing that these facts are about. That is, the facts have to be minimally organised in one's mind around the object that these facts are about. If they are so organised, we would maintain that we have the required sense of 'many memories of the same thing' which can plausibly be claimed to bring about experience of that thing. To have experience of a thing, then, it is necessary and sufficient: (a) to perceive various facts about that thing; (b) to be able to store and retrieve the perceived facts; and (c) to do so in an organised manner.

Two clarifications are in place here. First, in our example the organisation of facts is achieved by memory. From Aristotle's discussion in *De Mem.* 2 451^b10-22, we learn that representations of perceived things follow the order in which these things were perceived, especially if they are often perceived in the same sequence.²³ Although minimal, this seems to provide a sufficient principle of the required organisation of perceived and memorised facts. Note that rationality – understood as the ability to acquire, apply, manipulate, and express concepts – is not at all required for organising facts in this way. We shall see, however, that rationality greatly enhances the ability to organise facts, and thus makes experience much more powerful.

Second, we have pointed out that 'having many memories of the same thing' can be construed in three different ways, and only (3) is sufficient for the generation of experience. The difference between construal (1) and construals (2) and (3) is not that in (1) the 'many memories' are memories of perceived sensibles, whereas in (2) and (3) the 'many memories' are memories of perceived facts. We believe that Aristotle does not distinguish between non-propositional perception (e.g. to perceive the brown colour of something), and propositional perception (e.g. to perceive that something is brown).²⁴ The difference is, rather,

²³ One could object that Aristotle says this in the context of his discussion of recollection, which he denies to non-rational animals (cf. *De Mem.* 2 453^a6-14). Aristotle indeed says that the order of stored representations enables recollection (451^b10-11), but that does not prevent non-rational animals from having representations stored in the order in which things were perceived.

²⁴ A useful discussion of this issue is provided by A. Graeser, who takes the same view: "It seems obvious that Aristotle tends to assimilate the logic of propositional construction to that of the direct-object construction. One may thus

that in (1) the ‘many memories’ are restricted to memories of things perceived in themselves (special and common sensibles), whereas in (2) and (3) they include also memories of things perceived incidentally (incidental sensibles).

It seems that experience of a thing necessarily requires perception of at least one incidental sensible, namely that thing. John’s experience of the table requires that he is perceptually aware of something in addition to a brown colour and a square shape, that is of an *object* which happens to be brown and square, and which English speakers would call ‘table’. The table is not perceptible in itself, but incidentally, because some features that are perceptible in themselves happen to belong to it, i.e. because the table is brown and square. John must perceive the table in order to perceive various facts about the table, and to remember them in an organised manner. Also, many observed facts about the table will include perception of incidental sensibles. For instance, the table’s feature of being wooden is perceptible only because the table has certain colour, texture, shape, etc. Obviously, in the interpretation we are putting forward, incidental perception plays a crucial role in the acquisition of experience.²⁵

At this point we must insist that incidental perception is indeed perception, rather than some other type of cognition, inference or whatever else has been suggested.²⁶ We would agree that the ability to perceive incidental sensibles requires development, and that this development may need co-operation among various cognitive capacities, notably representation and memory. However, once the ability is sufficiently developed, incidental sensibles are indeed *perceived*.²⁷ We would also admit that the ability to perceive incidental sensibles is vastly enhanced by language and reason, but we would emphasise that rationality is not a necessary condition of incidental perception. Otherwise, non-rational animals could not have incidental

infer that he did not consider this difference as a philosophical option” (Graeser 1978, 92 n. 2).

²⁵ By ‘incidental perception’ we mean only perception of incidental sensibles. In *DA* III.1 425^a21-24 and 430^b4, Aristotle speaks of incidentally perceiving a special sensible of one sense by another sense, but such cases are irrelevant for our discussion.

²⁶ See, e.g., Beare 1906, 286; Block 1960, 94; Ross 1961, 34; Kahn 1966, 46; Kahn 1992, 367-368.

²⁷ Our view is closer to the accounts provided by Cashdollar 1973; Modrak 1987, 69-71; D. Frede 1992; Caston 1998; Bolton 2005.

perception, and that would militate against a number of passages where Aristotle seems to assign incidental perception to non-rational animals.²⁸

Not only is Aristotle ready to assign incidental perception to non-rational animals – at 980^b27 he says that non-rational animals “have a small share in experience”. This statement poses considerable problems for all interpretations that take experience to be a sort of rational disposition.²⁹ We believe that our interpretation enables us to avoid these problems. For if our interpretation is correct, we can explain two distinct points implied in Aristotle's statement, both (a) that some non-rational animals *have* experience, and (b) that they have only *a little* of it.

Some non-rational animals, those endowed with the senses and memory, (a) have experience because they are able to have many memories of the same thing in the relevant sense: they are able to perceive some incidental sensibles, and then to store and retrieve their perceptions in a minimally organised manner. Take the instance of a dog who, wanting to go for a walk, brings his leash to the master. This behaviour can be said to be based on rudimentary experience, since the dog must have previously observed the leash and some facts about it, e.g. that it has to do with the master and with going for a walk. However, (b) non-rational animals have only a limited share in experience because their ability to perceive incidental sensibles is much more modest than that of human beings. Presumably, there are not many things, and still fewer facts, that they can observe, and it is unlikely that they would be able to store and retrieve them in a highly organised manner. But to the limited extent that they *can* observe some facts about things, store and retrieve them in a minimally organised manner, they can be said to have a limited share in experience.

Now that we have an interpretation of ‘many memories of the same thing’, let us see what is the resultant ‘power of one experience’ (μῶς ἐμπειρίας δύναμις). It is reasonable to suppose that one experience is an experience of that one thing of which there are many memories. If ‘the same thing’ is taken in the sense of a numerically identical physical object, one experience is an experience of that one object. John's experience of the table in our previous example is one experience, whereas his experience of his car, provided that he has perceived and memorised a sufficient number of facts about it, is another experience.

²⁸ For instance, in *EN* III.10 1118^a20-21 the lion is said to perceive that the ox is near. Book IX of the *Historia Animalium* is full of claims which force us to assume that non-rational animals have incidental perception; e.g., “when the Egyptian ichneumon sees the snake called the asp, it does not attack until it has summoned others to help” (612^a16-17), the cranes are said to “see the clouds and bad weather” (614^b21), and the lion is “watching for the man who is shooting and then attacks him” (629^b24).

²⁹ Cf. Alexander, *In Met.* 4.20-26; Ross 1953, vol. 1, 116.

The talk of a *power* of one experience suggests that experience is something that enables its possessor to achieve something. On the one hand, it enables one to *do* something in relation to the thing of which one has experience. Roughly speaking, if John has an experience of the table – which includes observations that the table consists of five parts, and that these parts are fastened by bolts – it enables him to disassemble it. The example with a dog might be more illuminating. If a dog has observed the fact that the leash has to do with the master and with going for a walk, he should be able to take the leash to the master, and thus bring his desire for a walk to satisfaction – without having previously observed that sort of behaviour. So experience allows one to do certain things. This is, on a very basic level, what makes it a productive disposition comparable to art. However, while experience is a productive disposition based on perception of facts, their storing and retrieving in an organised way, art is a productive disposition based on knowledge of the relevant causes.

On the other hand, experience may enable its possessor to *know* something about the thing of which one has experience. Of course, it is knowledge of various facts about that thing, knowledge made possible by one's experience. This requires additional explanation. John perceives, remembers, and organises some facts about the table. The number and organisation of John's previously perceived and remembered facts about the table determines which new facts he is going to perceive. Had he not previously perceived that the table is stable, that it has four legs, that they are fastened to the top with bolts, it would be very unlikely that John would be in a position to observe the next fact, say, that loosening the bolts makes the table unstable. In that sense experience is a cognitive disposition: on the basis of previously perceived, memorised, and organised facts about a thing, it enables observation of still further facts about that thing, and each newly observed fact may stimulate observation of many new facts. This tendency of experience to grow is what allows Aristotle to rate it higher than perception, while at the same time confining it, together with perception, to knowing only *that* something is the case.

4. Growing Experience

We have seen that having many memories of the same thing consists in having perceived a number of facts about that thing, having them stored and retrievable in an organised way. We have seen also that having many memories of the same thing constitutes one experience which enables its possessor to achieve certain things in both cognitive and practical terms. However, so far we have given an account only of the most elementary form of experience, the one which allowed Aristotle to attribute a bit of experience to some non-rational animals. In this section we shall present an account of more developed forms of experience.

Of course, our account is bound to be somewhat speculative, since Aristotle does not say much about the development of experience. As we have pointed out earlier, there is a wide gap between the elementary and the advanced form of experience which is supposed to furnish the principles of science. Since we propose to close this gap with a unified notion of experience, we have to provide a plausible explanation of the development of experience which will expand on the premisses utilised so far and, at the same time, remain within the boundaries of Aristotle's philosophy.

To begin with, more developed forms of experience all come as a consequence of the natural tendency of experience to grow. And, we would suggest, it grows in two distinct ways. It grows horizontally, in the sense that it brings about knowledge of new facts at the same level of generality. As we have indicated, on the basis of perceived, stored and suitably organised facts about the table, John can learn more facts about that table. But experience grows vertically too, in the sense that it brings about knowledge of new facts at a higher level of generality. Having encountered other tables, each with slightly different properties, John perceives a number of facts about each one of these particular tables, but after a while he can also perceive facts about tables in general, e.g. that tables come with tops of different shapes and materials, that they come with a different number of legs, that this number is never smaller than three, etc. Supposing that John has perceived, stored and organised such facts, we should be able to say that he has experience of tables. His experience has grown not only horizontally, but vertically as well. Likewise, having perceived various facts about different pieces of furniture (e.g. tables, chairs, shelves), and having them stored and

organised, John's experience has grown even further, and now he has experience of one entire domain, say carpentry, which involves growth on both the horizontal and vertical axis.

There are two things we would like to point out in this connection. First, the two axes seem to be mutually dependent. Progress along the horizontal axis enables, or at least facilitates, an advance along the vertical axis. Had John not encountered a number of tables and perceived, stored and organised various facts about them, he would hardly be able to have the experience of tables in general. Similarly, an advance along the vertical axis enables progress along the horizontal axis. Once John comes to develop the experience of tables in general, he can perceive, store and organise a number of facts about tables in general. Perhaps we could illustrate this interdependence of the two axes by a spotlight hanging from the ceiling: if you want it to illuminate a wider surface on the floor, you have to pull it up a notch.³⁰

Second, vertical growth of experience is not restricted to the category of substance. As John's experience of carpentry grows, he comes to deal not only with tables in general or furniture in general, but also with universal properties such as stability, solidity, etc. This is important because explanatory items constitutive of art and science cannot be universals in the category of substance only.

Now it is reasonable to suppose that the little experience that some non-rational animals achieve grows to a limited extent along the horizontal axis only, whereas human experience grows not only more widely along the horizontal axis, but along both axes. This can be explained with reference to the principles of organisation of perceived and stored things in non-rational and rational animals. To the small extent to which they share in experience, non-rational animals must be able minimally to organise the perceived and stored facts. The dog must have a way of connecting the leash, the master, and going out for a walk

³⁰ Aristotle seems to give an important role to experience precisely because it ensures that our knowledge proceeds not only vertically but horizontally as well. The view according to which knowledge develops only vertically is criticized at *GC I.2 316^a5-10*: "The cause of comparative inability to see the agreed facts as a whole is inexperience. That is why those who are more at home in physical investigations are better able to postulate the sort of principles which can connect together a wide range of data: those whom much attention to logic has diverted from study of the facts come too readily to their conclusions after viewing a few facts" (transl. Williams 1982).

in order to be credited with experience which enables him to bring the leash to the master when desiring to go out for a walk. Such connection, we have suggested, can be achieved by association of representations of previously perceived things. Although human beings can, and at some stage of their development probably do organise previously perceived and stored facts in this way, the use of concepts and language, which is constitutive of rationality, greatly improves their ability to organise observed and stored facts. Among other things, it enables them to group the observed things under universals and form universal judgements about the facts that they have observed and stored. Making universal judgements is thus a great leap in the ability of organising facts. For unless facts are organised by being generalised, it would be impossible for Aristotle to claim that experience can provide us with *all* facts in a domain.³¹ So, if he is an experienced carpenter, John can organise his observations by making universal judgements that apply to all tables, all chairs, and even all furniture.

Someone might object to this by saying that, according to Aristotle, making universal judgements is the prerogative of art and science, not experience.³² The main piece of evidence for this objection seems to come from *Met.* A.1 981^a5-12:

Art arises when one universal judgement about similar things is produced from many thoughts of experience. To have the judgement that when Callias was ill of this disease this benefited him, and similarly in the case of Socrates and many other individuals, is a matter of experience; but to have the judgement that it has benefited all such-and-such persons, marked off according to one *eidōs*, when they were ill of this disease – e.g. to phlegmatic or bilious individuals when they were burning with fever – this is a matter of art.

³¹ See *APr.* I.30 46^a16-27 for the claim that experience should be exhaustive. One could read a qualification of this requirement from *DA* I.1 402^b22-25, where Aristotle says that “when we are able to give an account of either all or most of (ἢ πάντων ἢ τῶν πλείστων) the attributes as they appear to us, then we shall be able to speak best about the essence too” (transl. Hamlyn 1968). This qualification is probably due to Aristotle’s appreciation of the fact that the accumulation of experience can be hindered by various objective and subjective factors. Nonetheless, it was clearly his view that one’s experience should be as exhaustive as possible.

³² Arguments in support of this claim can be found in Charles 2000, 150-153. See also Bolton 1991, 38.

Aristotle seems to say that forming a universal judgement about similar things on the basis of experience belongs to art, not to experience. He also insists that experience is cognition of particulars (981^a15-16), so that it may seem that an experienced person is able to make only particular-oriented judgements, such as ‘This table is such and such’, and not universal judgements, such as ‘Tables in general are such and such’. We are inclined to think that this cannot be Aristotle’s view. Experience can very well produce many universal judgements about similar things from many thoughts. What distinguishes judgements of experience from those of art and science is not their lack of universality, but their lack of explanatory power (cf. 981^a28-29).³³ Aristotle does not want to say that forming *any* universal judgement about similar things on the basis of experience belongs to art, but only those universal judgements that employ relevant explanatory items. This is clear from his description of the judgement that belongs to art in 981^a10-12, where the emphasis is not on its universality (πᾶσι) as much as on the fact that it makes use of one explanatory item or *eidōs* (τοῖς τοιοῖσδε κατ’ εἶδος ἐν ἀφορισθεῖσι). Judgements of experience fall short of picking up and making use of the relevant explanatory item, while judgements of art are informed by an insight into them.³⁴

Let us give an example. Nothing prevents a person experienced in animals from having such an exhaustive experience that he is able to make a judgement that all deer, and only deer, shed their horns.³⁵ However, this experience is not sufficient to provide him with an explanation of that fact. If we ask him why that is the case, all he can do is to say that all deer he has seen shed their horns, and no other animal he has seen sheds its horns. Aristotle thinks that the right explanation is that all deer, and only deer, have horns that are solid throughout: solidity makes horns very

³³ In his elucidation of the medical example in A.1 981^a5-12, M. Frede (1996, 160-162) also seems to think that experience is perfectly capable of yielding generalizations. What it cannot grasp is what Frede calls ‘salient features’, e.g. being of a bilious or phlegmatic condition. Cf. Sorabji 1993, 34 and Sisko 1996, 148.

³⁴ On this point our interpretation fully agrees with that of V. Politis: “Aristotle’s distinction between experience (*empeiria*) and scientific knowledge (*epistēmē*, *technē*) is *not* the distinction between particular and general knowledge [...] Rather, [it] is the distinction between general knowledge that is not explanatory and general knowledge that is explanatory” (2004, 38, Politis’ italic).

³⁵ The example and explanation are Aristotle’s: cf. *PA* III.2 663^b12-14 (cf. also *HA* II.1 500^a7-14).

heavy, which is an impediment to deer's well-being, so they must be shed off. Now, even if the person experienced in animals has observed and stored the fact that all deer, and only deer, have horns that are solid throughout, he would not know that all deer shed their horns *because* their horns are solid throughout.

Likewise, in Aristotle's medical example a person endowed with medical experience can form the judgement that a certain medication was beneficial for Callias when he suffered from a certain disease, that it was beneficial for Socrates when he suffered from the same disease, etc. He can also form the judgement that it was beneficial for all persons suffering from this disease that he has met in the past. Under certain conditions (e.g. witnessing the same fact many times with no or few exceptions, confirming it by consulting other doctors or medical reports, etc.), he might be inclined to form the judgement that the medication in question is beneficial for all human beings suffering from this disease. Forming such a generalised judgement – a 'theorem', as later empiricist doctors would call it – enables him to move on to other facts about this medication and this disease, and to connect these facts with other facts in the domain. However, such a universal judgement, insofar as it is a result of experience, is always particular-oriented, since the only justification that can be given for it comes from particular cases. This judgement is based on, and justified by, a collection of particular cases which follow the same, or at any rate sufficiently similar, pattern. Thus, the judgements of experience, no matter how universal they may be, are always confined to particulars in the sense that they derive their justification from particulars. It is in this sense, we submit, that experience is confined to particulars: its judgements are justified only by appealing to the particular.

Judgements of the person informed by art or science, by contrast, can provide the *why*'s. A person informed by art will be able to recognise an explanatory item among the many thoughts that are the matter of experience. A universal judgement he is able to make – say, 'all deer shed their horns because their horns are solid throughout' – is produced as a result of insight into this explanatory item, having horns that are solid throughout, and its relations to being a deer and leading a life characteristic of that species. It is not, as is the case with judgements of experience, produced as a result of observing deer and compiling facts about them. Rather, it is a result of recognising that one item explains

another. And because universal judgements of art or science are based on such explanatory items, these judgements are necessary truths, or at any rate they are as true as their subject-matter permits them to be. This recognition of explanatory items has very little to do with perception and memory, whether aided by concepts and language or not, and everything to do with an altogether different, higher cognitive capacity. In other words, experience seems to be a cognitive disposition which can, if rich enough, provide one with facts that include explanatory items constitutive of art and science. What it cannot do, as we shall argue in Section 5, is to enable one to recognise these items as such and to connect them appropriately with other items in the domain. That is to say, experience, even aided by concepts and language, is unable to discern explanatory relevance of certain facts that it has acquired. However, in so far as it does acquire these facts, it is the source of higher cognitive capacities of art and science. For provided that one has a sufficiently rich experience that something is the case, one may start wondering why that is the case. This seems to be a cognitive shift, a true transformation of one's attitude to one's subject-matter, a transformation which seems to be constitutive of art and science. Of course, we would like to know how this transformation comes about. Aristotle's answer, judging by the first part of *Met.* A.1, would be deceptively simple: we are constituted in such a way that if we actualise our prior cognitive capacities and dispositions, and acquire sufficiently rich experience, we shall naturally start to wonder about the causes and be on our way to acquiring the ability to spot them. However, wondering about the causes, asking oneself why something is the case, is only a start.

5. *Beyond Experience*

While the ability to form universal judgements has to do with basic rationality, the ability to pick out relevant explanatory items and formulate universal judgements based on such items belongs to higher cognitive capacities such as arts and sciences.³⁶ Hence, basic rationality should suffice for universal judgements of experience, but not for universal judgements of art and science.

³⁶ Elsewhere Aristotle insists that the ability to grasp principles belongs specifically to *νοῦς*. However, in *Met.* A.1 he does not mention *νοῦς*. He seems to imply that it is integrated in art and science; so Ross *ad* 982^b2.

Aristotle insists that “experience made art”, but his discussion in *Met. A.1* does very little to clarify how judgements of art come about from judgements of experience. Perhaps this should not be regarded as an oversight on Aristotle's part, since the purpose of the first part of *Met. A.1*, as we have argued at some length, is to introduce different cognitive capacities and dispositions, as required by his subsequent arguments for the main thesis that wisdom is knowledge of certain principles and causes. Having elucidated the difference between experience and art, therefore, he does not find it necessary to clarify how exactly the latter comes about from the former.

We have seen that judgements of art are based on insight into the relevant explanatory items, which provide justification of their truth. To have an art, a person must be able to provide a justification of any judgement belonging to the domain of that art by appealing to such items. Unless she is able to do that, she will lack the ability to do the things that, according to Aristotle, differentiate art from experience. For instance, she will not be able to teach her art, since teaching is, in Aristotle's view informed by the Socratic tradition, primarily a matter of giving explanations. Furthermore, Aristotle believes that, among explanatory items in a domain, some are more explanatory than others. He also believes that there are items which are self-explanatory. These are the items which explain all other items, but which themselves stand in no need of explanation. Such items are *principles* of a domain. So, to have full mastery of an art or science, a person has to be able to grasp the principles of that art or science. This is the only guarantee that she will be able to give adequate explanations of her practices or of her judgements. It turns out, then, that if we want to understand how an art or science comes about, we must understand the manner in which one comes to grasp the principles of that art or science. Since Aristotle believes that experience is indispensable for the generation of art or science – and there is no intermediate stage between experience and art or science – it follows that experience must somehow provide all the relevant explanatory items, including the principles of art and science. This is clearly stated in *APr. I.30* 46^a17-22:

The majority of principles for each science are peculiar to it. Consequently, it is for our experiences concerning each subject to provide the principles. I mean, for instance, that it is for astronomical experience to provide the principles of the

science of astronomy (for when the appearances had been sufficiently grasped, in this way astronomical demonstrations were discovered; and it is also similar concerning any other art or science whatsoever).³⁷

What this passage suggests is that experience or accumulation of facts in a domain is the first stage of the progress towards an accomplished science.³⁸ The second stage, we suppose, consists in applying various methods (e.g. dialectic or division) in order to establish relations among the accumulated facts and to produce the sort of propositions needed for demonstration. The third and final stage is demonstration or arranging these facts in the right way. Although more would have to be said about all this, especially about the second stage, here we are interested in the first stage, that is the role of experience in this process. Why does Aristotle insist that experience can provide the principles and how is this supposed to happen? Unfortunately, he is not very clear on this point, but there are passages in *APo.* II.19 which seem to offer some clues about his position.

However, *APo.* II.19 is notoriously difficult to interpret. This is partly due to Aristotle's conciseness and partly to his wish to solve several distinct and difficult problems in one breath. He begins by posing two questions concerning principles: how they become knowable to us, and what is the disposition which enables us to know them (99^b17-18). Having gone through some initial puzzles (99^b20-32), he concludes that the disposition which enables us to know the principles, later identified as the intellect (100^b12), comes about from the capacity of perception (99^b32-35; cf. also 100^a11). But how can perception – which is, as Aristotle insists (99^b34), a capacity which humans share with non-rational animals – ultimately generate the disposition by which we know the first principles of art and science, the possession of which is the highest human cognitive achievement? Aristotle addresses this question in two successive passages, 99^b34-100^a3 and 100^a3-^b5.

In 99^b34-100^a3, Aristotle describes the process by which perception brings about memory, and by which memory, in turn, brings about *logos*

³⁷ Transl. Smith 1989.

³⁸ This stage is sometimes described as *ἵστορία*. At *APr.* I.30 *ἵστορία* (46^a24) seems to be equivalent to *ἐμπειρία* (18, 19). The role of *ἵστορία* as a pre-demonstrative stage in Aristotelian natural science is most thoroughly discussed by Lennox 2001.

(100^a2) in some animals. He does not explain what he means by *logos* here, and interpreters usually take this word to refer to an item – account, explanation, definition, form, etc. – that can serve as the principle of art and science.³⁹ It seems to us, however, that this is not what is meant by *logos* in this passage, and that it is better to take this word with reference to a *capacity*, namely *reason*. Hence, the passage should be construed as an account of how one species of animals develops rationality.⁴⁰ There are at least two considerations that lead to this conclusion. First, this is exactly what one might expect at this juncture of Aristotle's argument. For given that perception is common to rational and non-rational animals, Aristotle must first mark off rational from non-rational perceivers, and only then he can show that in rational perceivers the capacity of perception can ultimately give rise to the intellect. Second, Aristotle says in our passage that *logos* comes about from repeated retention of percepts in the soul. But surely much more is needed for our coming to know the principles of art and science than the repeated exercise of the ability to perceive various things and to store what we have perceived. As Aristotle makes it clear a little later, in 100^a6-8, the crucial role in this process belongs to experience. Now, if Aristotle really wanted to give an account of the way we become aware of principles already in 99^b34-100^a3, why would he omit experience as a crucial stage?

Having interpreted *logos* in 100^a2 as a capacity, namely reason, a further specification is needed. We have spoken of 'basic' rationality, and that is, roughly speaking, the ability to acquire, apply, manipulate, and express concepts. Aristotle sometimes refers to it as *logismos*, and keeps it distinct from the higher form of rationality which enables one to achieve immediate grasp of the most fundamental and self-explanatory items.⁴¹ In human beings, this higher form of rationality – the intellect or 'noetic rationality' – cannot exist without the lower form of

³⁹ See, for instance, Ross 1957, 674 ('conception'); Barnes 1994, 264 ('account (i.e. a definition)'); Modrak 1987, 162 ('account'); Wedin 1988, 43 ('form').

⁴⁰ M. Frede (1996, 169) also reads *λόγος* as a capacity. However, while we identify this capacity as 'basic rationality', he identifies it with *νοῦς* or what we shall call 'noetic rationality'.

⁴¹ *DA* II.3 415^a8-12 shows very clearly that Aristotle draws a clear distinction between the two. See also *EN* VI.1 1139^a3-15, *DA* III.10 433^a12-15, *Pol.* VII.15 1334^b10-25.

rationality, whereas the lower form of rationality can very well exist without the higher. Having made this distinction, it is clear that we take the view that in 99^b34-100^a3 Aristotle says that only basic rationality comes about from repeated retention of percepts in the soul. Furthermore, assuming that basic rationality is a capacity naturally developed in one species of animals, the claim that it “comes about” (γίγνεσθαι) from repeated retention of percepts is best interpreted in the sense that it is brought from potentiality into actuality⁴² by memory of things perceived a number of times. Indeed, it is highly probable that children acquire their first concepts in relation to things they perceive most often and of which they have most memories, such as their mother or father.⁴³

We have seen earlier that perception and memory are equally important for the development of experience too, and also that higher forms of experience depend on basic rationality. We are arguing, therefore, that for Aristotle experience and basic rationality are two distinct capacities; in rational animals they fruitfully interact, but each one of them has an account which does not involve the other: experience is an acquired disposition essentially constituted by perception and memory, whereas rationality is a natural capacity of human beings brought into actuality by perception and memory. Hence, there is no need to assume that Aristotle’s account of basic rationality in 99^b34-100^a3 makes reference to experience.

Having shown how the capacity of perception leads to basic rationality, Aristotle can then confine his discussion to rational perceivers and discuss how they develop the disposition that enables them to know the principles, that is, how they acquire noetic rationality. At 100^a3-9 he says:

So from perception there comes memory, as we say, and from memory (when it occurs many times about the same thing), experience (ἐκ δὲ μνήμης πολλάκις τοῦ αὐτοῦ γινομένης ἐμπειρία); for memories that are many in number form a single experience (αὐτὰ γὰρ πολλὰ μνήμαι τῷ ἁριθμῷ ἐμπειρία μία ἐστίν). And

⁴² More precisely, from the first into the second potentiality, the latter being the same as the first actuality; cf. *DA* II.1 412^a20-28, 5 417^a21-30.

⁴³ Perhaps we can infer that Aristotle was aware of that from his observation in *Phys.* I.1 184^b12-14 that children at first call every man ‘father’ and every woman ‘mother’.

from experience or from the whole universal that has come to rest in the soul (ἐκ δ' ἐμπειρίας ἢ ἐκ παντός ἡρεμήσαντος τοῦ καθόλου ἐν τῇ ψυχῇ) – the one apart from the many which is one and the same present in all of those – comes the principle of art and science, of art if it deals with how things come about, of science if it deals with what is the case.

Aristotle says that “from experience [...] comes the principle of art and science”. As in the case of *logos* above, we might be inclined to take the phrase ‘principle of art and science’ in the sense of an explanatory item, *eidos*, definition, or whatever else may serve as a principle of art and science. This, again, is not very plausible. What Aristotle is discussing in the passage is the sequence of capacities and how they generate each other, and we should expect the last member of the sequence, the ‘principle of art and science’, to be a capacity, rather than its object. Hence, the ‘principle of art and science’ must refer to a capacity developed from experience. This capacity clearly has to be rational, and, unless we want to saddle Aristotle with repetition, he is not talking about basic rationality, but about higher, noetic rationality, or the intellect.⁴⁴ And the passage ultimately distinguishes two kinds of intellect, one operating in art, and another in science.

It turns out, then, that Aristotle holds that experience somehow gives rise to the intellect. Unfortunately, he does not say explicitly how this is supposed to happen. He only suggests that the link between experience and the intellect is ‘the whole universal coming to rest in the soul’. It is reasonable to suppose that ‘the whole universal’ is something that the intellect grasps as a principle. However, the nature of that universal and the manner in which it is associated with experience are not immediately clear. Does its coming to rest belong to experience, or goes beyond it?

To begin with, it seems that there is a straightforward sense in which experience is associated with universals. We have insisted that basic rationality enables human beings to operate with universals and that this capacity greatly enhances their ability to organise the facts they have perceived and stored. However, we are not entitled to identify these universals with ‘the whole universal’ which is supposed to be the object of the intellect. For it is clear that universals that are objects of the intellect must be explanatory universals, and not just any explanatory universals, but explanatory universals of the highest order that serve as

⁴⁴ Intellect is called *ἄρχή* also at *APo* I.3 72^b24, 33 88^b36, and II.19 100^b15.

principles of art and science. The universals with which an experienced person operates are not explanatory, or at any rate the person does not recognise them as such. For this person, universals are convenient means of thinking and speaking about the particulars, which comes along with basic rationality. Universals enable rational beings to group things together and form generalised judgements, but not, without further qualification, to explain things.

For instance, when people want to organise facts accumulated by experience, they can group them together on account of their similarities. However, only some of these similarities may be due to the fact that similar things share the same explanatory item. You can group things under the universal *left-handed*, but this universal is not an explanatory item. *Left-handed* does not refer to one single item which makes all left-handed individuals left-handed, but merely groups together human beings whose motor skills are developed, for a variety of reasons, in such a way that they become more efficient with their left hand. But when you group things together under the universal *human being*, this *is* an explanatory item, although you may not be wise enough to see that. It is the essence of human beings, captured by an adequate definition, that makes all human individuals human beings. So, one can learn to use this universal, and find it very handy in everyday communication, without grasping its explanatory power. In fact, this seems to be what a vast majority of people do – and all that they really need to fare well in life. Consequently, we can have experienced persons group things together under universals and make universal judgements, and some of these universals can even happen to be explanatory, but experienced persons as such do not grasp their explanatory power.

Hence, ‘the whole universal’ should not be identified with a universal used by experienced people to form their universal judgements. However, this does not mean that it cannot be one among the items of which experience makes use. As we have seen, higher cognitive achievements like art and science are not distinguished from experience insofar as experience operates with entities of one kind, whereas art and science operate with entities of another kind. The difference can very well consist in the attitude towards the same set of entities. A person in pursuit of experience wants to collect and organise as many facts as needed for success in production, study or dealing with other people. A person in pursuit of art or science, by contrast, wants to understand things, that is to recognise things that successfully explain other things. It follows, then, that some of the items accumulated by experience may be explanatory items and some may not. An experienced person can use

both to organise facts, but he is not able to distinguish between them. However, the presence of these items in experience is indispensable if he wants to develop the disposition which will enable him to recognise them as explanatory. Once he starts to wonder why something is the case and applies various procedures in an attempt to figure out an explanation, success is guaranteed only if his repertoire already includes explanatory items. Hence, by suggesting that the link between experience and the intellect is 'the whole universal coming to rest in the soul' Aristotle simply indicates the fact that experience provides a number of items among which some are explanatory, and some even self-explanatory. However, experience does not allow one to recognise these items as such.⁴⁵

Can the text bear out this interpretation? It all depends on how one reads the connective η (100^a6). This word can be, and has been, read with subtle differences in meaning.⁴⁶ We take it to introduce specification ("from experience, *or more precisely* from ..."); that is, the connective specifies what it is about experience that enables it to give rise to the intellect. It enables the acquisition of items of the highest explanatory power. But, as we have pointed out, experience cannot grasp these items as such.

Now the question arises why this highest explanatory item is characterised as 'the *whole* universal'. Perhaps we can extract an answer from 100^a14-^b5. At 100^b2-3 Aristotle discusses a sequence of universals, arranged – apparently – according to their universality, and says that this sequence culminates in a universal which is 'partless' ($\acute{\alpha}\mu\epsilon\rho\acute{\epsilon}\varsigma$). Since it is natural to suppose that this last item in the sequence is the object of the intellect, it can be identified with 'the whole universal'.

Let us take a closer look at that sequence. It seems to be an example of the vertical growth of experience explained in Section 4. Its first two

⁴⁵ In his definition of $\epsilon\pi\iota\sigma\tau\acute{\eta}\mu\eta$ (*APo.* 1.2 71^a9-12), Aristotle insists that $\epsilon\pi\iota\sigma\tau\acute{\eta}\mu\eta$ of an item requires not only knowing its cause but also knowing that that cause is its cause. "It is possible, where E is an explanatory principle of some science, to know that E is the case without understanding that (or how) it is a principle of that science" (Kosman 1973, 383). While experience can satisfy the first condition (knowing that E, which is the cause of F, is the case), it cannot satisfy the second (knowing that E is the cause of F).

⁴⁶ For a useful discussion of this, see Charles 2000, 149-150, and McKirahan 1992, 243.

members are *such and such an animal* and *animal*, and we would expect it to continue with *living being* and end up with *substance*. The sequence seems to be ascending in universality, and the last item in this ascent, substance, can be said to be ‘partless’: all subordinate items have substance as their part – for each one of them is a substance and has an account which ultimately has to mention substance – whereas substance itself has no other items as its parts. However, it is questionable whether substance is the right sort of thing to be the last member of this particular sequence. The last universal is supposed to be the object of the intellect, that is, it should be among the principles of art and science, and it is doubtful whether substance should be among the principles of every art and science. Perhaps it is a principle of the science Aristotle calls ‘wisdom’ in *Met.* A and ‘first philosophy’ in *Met.* E, but what about arts such as medicine or carpentry? Surely we can have an expert carpenter who has no concept of substance, let alone operates with it as a principle. Perhaps substance need not bulk large in particular sciences either, e.g. astronomy or biology. For one thing, we know that the first principle of biology is the soul – that in virtue of which a living being is what it is and does whatever it typically does. So the sequence in Aristotle’s example, as far as biology is concerned, is more likely to go from *animal* to *living being* and then to *soul*. The soul is the ultimate thing which explains everything else in biology: why plants grow, why animals perceive and move about, why human beings think, why each sort of living being has the particular sort of body that it has, etc.⁴⁷ All other items and facts in biology are ultimately explained with reference to the soul, whereas the soul is not explained with reference to any other item or fact. In the sense in which the soul is ultimately present in explanations of all other biological items, the soul is their part. And in the sense in which there is no other item to explain the soul, the soul is partless. It turns out, then, that ‘the whole universal’ is a single item whose presence in particulars makes them the sort of thing that they are. Aristotle follows Plato in calling items of this sort *eidē*, in thinking that each one of them is a single entity present in many particulars, in believing that they are entities responsible for particulars being what

⁴⁷ “The soul is in the primary way that by means of which we live, perceive, and think. Hence it will be a kind of principle and form” *DA* II.2 414^a12-14 (transl. Hamlyn 1968).

they are, and consequently in regarding them as explanatory items. Where Aristotle disagrees with Plato, of course, is over the ontological status of such items and over the way we come to know them.⁴⁸

So the sequence is not ascending in universality as much as in explanatory power. If this is what Aristotle means by 'the whole universal', then the following picture emerges. Experience enables the acquisition of items that have explanatory power, including those items that are self-explanatory and that explain all other items, i.e. principles of art and science. Along with other items acquired by experience, at this level they serve only to organise data accumulated by experience. Experience is blind to their explanatory power. An experienced person is unable to distinguish between those items that are not explanatory and those that are, let alone those that are self-explanatory. However, if experience is to give rise to art and science, it has to supply items that one will recognise – once one starts to look for the *why*'s – as explaining others. Likewise, if experience is to give rise to the intellect, it has to supply items that the intellect will recognise as supremely explanatory, i.e. as principles. It is in this sense, we submit, that experience gives rise to art and science, and to the intellect.

This also explains why Aristotle insists that experience has to be comprehensive. It provides facts and items among which those explanatory ones are to be discovered, including the very principles. Unless experience is comprehensive, one cannot be sure that the set of discovered explanatory items is complete, i.e. that no explanatory item is left out. And it is of paramount importance that no explanatory item is left out, because the higher on the hierarchical structure of propositions of an art or science the missing item belongs, the greater its effects on the lower levels of that structure. Failing to discover a principle, or a suitably high explanatory item, due to an incomplete experience, may ruin the whole structure.

⁴⁸ The interjected sentence in 100^a7-8 seems to contain a brief criticism of Plato's epistemology. Essentially, it suggests that explanatory universals, which Plato identifies with Forms, come from experience of the outside world, rather than from the soul shutting off to recollect (*Phaedo*) or doing some thinking 'itself by itself' (*Theaetetus*).

6. Conclusion

In this paper, we have tried to give a unified account of experience in Aristotle's theory. We have shown how Aristotle can coherently maintain that some non-rational animals can have a bit of experience, and at the same time that experience brings about art and science. Experience can take various forms, we have argued, from the primitive one achieved by association of representations in memory, to the highly developed one which presupposes basic rationality. Both forms of experience enable one to do something that one would not be able to do otherwise, or to know something that one would not be able to know simply by means of perception and memory.

That basic rationality is presupposed by higher forms of experience is clear from Aristotle's talk of 'thoughts of experience' which amount to judgements concerning things of which one has experience. The fact, however, that it is presupposed by higher forms of experience does not mean that it is necessary for lower forms of experience too. This is what interpreters who take experience to be essentially a rational capacity fail to see, and why they have difficulties with Aristotle's attribution of experience to some non-rational animals. By contrast, we have distinguished between experience and basic rationality, finding some evidence for this distinction in *APo.* II.19. This distinction enabled us to take experience, in all its forms, as a single cognitive disposition. It is a single cognitive disposition because it has to do, in all its forms, with accumulation of facts concerning particulars. If experience is coupled with rationality, facts can be organised by means of universals and formulated in universal propositions. But even then, experience remains knowledge of particulars justified by particulars. In other words, when coupled with basic rationality, experience does not become a different cognitive disposition, but remains the same disposition, only much enhanced. And, as we have explained, it is much enhanced because universals provided by basic rationality can be used to acquire more facts and organise them in a systematic way.

Moreover, we have suggested that principles of art and science lurk among the universals which are used to organise facts gathered by experience, and that is what entitles Aristotle to say that experience yields art and science. However, one has to switch from the mode of seeking facts (experience) to the mode of seeking causes and

explanations (art and science) to be able to recognise that some universals which are used to organise facts of experience are in fact explanatory items or even principles in a domain. We have tried to show that there is a sense in which experience is indispensable if one wants to achieve knowledge not only of items which explain particular things or facts in a domain, but of ultimate explanatory items as well, i.e. of principles in a domain. Hence, it is indispensable for the development of noetic rationality, that is, of the highest cognitive capacity. The ability to spot first principles, moreover, requires comprehensive experience, and such experience is both sufficiently wide (horizontal axis) and suitably general (vertical axis).

Of course, our interpretation hinges on the divorce of experience and what we have called 'basic rationality'. Aristotle does not expressly mention such a distinction, and he seems to assimilate basic rationality to the form of experience characteristic of adult human beings. Perhaps we should not be surprised by that. Our experience is informed by concepts and language, and it is hard even to imagine what it would look like without them. However, if we want to credit Aristotle with a coherent notion of experience, we have to make this distinction on his behalf.⁴⁹

- Barnes, J. ²1994. *Aristotle: Posterior Analytics*. Oxford.
- Beare, J. I. 1906. *Greek Theories of Elementary Cognition from Alcmeon to Aristotle*. Oxford.
- Block, I. 1960. "Aristotle and the Physical Object". *Philosophy and Phenomenological Research* 21: 93-101.
- Bolton, R. 1991. "Aristotle's Method in Natural Science: *Physics* I". In L. Judson (ed.), *Aristotle's Physics: A Collection of Essays*. Oxford.
- . 2005. "Perception Naturalized in Aristotle's *De Anima*". In R. Salles (ed.), *Metaphysics, Soul, and Ethics in Ancient Thought*. Oxford.
- Cashdollar, S. 1973. "Aristotle's Account of Incidental Perception". *Phronesis* 18: 156-75.
- Caston, V. 1998. "Aristotle and the Problem of Intentionality". *Philosophy and Phenomenological Research* 58: 249-298.
- Charles, D. 2000. *Aristotle on Meaning and Essence*. Oxford.

⁴⁹ We are grateful to Myles Burnyeat, Gisela Striker and an anonymous referee for their helpful comments and suggestions on earlier versions of this paper.

- Frede, D. 1992. "The Cognitive Role of *Phantasia*". In M. C. Nussbaum and A. O. Rorty (eds.), *Essays on Aristotle's De Anima*. Oxford.
- Frede, M. 1996. "Aristotle's Rationalism". In M. Frede and G. Striker (eds.), *Rationality in Greek Thought*. Oxford.
- Graeser, A. 1978. "On Aristotle's Framework of Sensibilia". In G. E. R. Lloyd and G. E. L. Owen (eds.), *Aristotle on Mind and the Senses*. Cambridge.
- Hamlyn, D. W. 1968. *Aristotle: De Anima Books II and III*. Oxford.
- Heinemann, W. H. 1941. "The Analysis of Experience". *The Philosophical Review* 50: 561-584.
- Jaeger, W. ²1948. *Aristotle: Fundamentals of the History of his Development*. Transl. R. Robinson. Oxford.
- Kahn, C. H. 1966. "Sensation and Consciousness in Aristotle's Psychology". *Archiv für Geschichte der Philosophie* 48: 43-81.
- . 1992. "Aristotle on Thinking". In M. C. Nussbaum and A. O. Rorty (eds.), *Essays on Aristotle's De Anima*. Oxford.
- Kosman, L. A. 1973. "Understanding, Explanation, and Insight in Aristotle's *Posterior Analytics*". In E. N. Lee, A. P. D. Mourelatos and R. Rorty (eds.), *Exegesis and Argument*. Assen.
- Lennox, J. G. 2001. "Between Data and Demonstration: The *Analytics* and the *Historia Animalium*". In J. G. Lennox, *Aristotle's Philosophy of Biology: Studies in the Origins of Life Science*. Cambridge.
- McKirahan Jr., R. D. 1993. *Principles and Proofs: Aristotle's Theory of Demonstrative Science*. Princeton.
- Modrak, D. 1987. *Aristotle: The Power of Perception*. Chicago and London.
- Politis, V. 2004. *Aristotle and the Metaphysics*. London and New York.
- Renehan, R. 1995. "Polus, Plato, and Aristotle". *The Classical Quarterly* 45: 68-72.
- Ross, W. D. ²1953. *Aristotle's Metaphysics*. 2 vols. Oxford.
- . 1957. *Aristotle's Prior and Posterior Analytics*. Oxford.
- . 1961. *Aristotle: De Anima*. Oxford.
- Sisko, J. E. 1996. "Material Alteration and Cognitive Activity in Aristotle's *De Anima*". *Phronesis* 41: 138-157.
- Smith, R. 1989. *Aristotle: Prior Analytics*. Indianapolis and Cambridge.
- Sorabji, R. 1993. *Animal Minds and Human Morals: The Origins of the Western Debate*. London.
- Wedin, M. W. 1988. *Mind and Imagination in Aristotle*. New Haven.
- Williams, C. J. F. 1982. *Aristotle's De Generatione et Corruptione*. Oxford.