ANNA MARMODORO

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I started working on this book project in 2008 as a British Academy postdoctoral fellow and a junior research fellow of Corpus Christi College at the University of Oxford. The project took a new direction in 2011 when I came to a fresh understanding of Aristotle's metaphysics within my research program *Power Structuralism in Ancient Ontologies*, supported by a starting investigator award (number 263484) from the European Research Council. Throughout the years, the two Oxford institutions to which I belong, namely the Faculty of Philosophy and Corpus Christi College, have offered me the most supportive environment for this research. I am thankful to my colleagues, as well as to the many who engaged with my research on different occasions, from different institutions. During the preparation of this book I benefitted further from visiting research fellowships at the University of Harvard (Center for Hellenic Studies) and the Australian National University, as well as a research period at the Rockefeller Foundation Bellagio Center. I was fortunate to be invited to give talks on a variety of topics related to this book in a number of places in Europe, the United States, Australia, and Brazil, and on

Introduction

How can one explain the structure of experience? What is it that we perceive? How is it that we perceive objects and not disjoint arrays of properties? By which sense or senses do we perceive objects? Does this type of perception require a further sense over and above the five senses?

Perception for Aristotle is an instance of causal interaction between the properties of objects in the world and the perceiver's sense organs. It is the mutual activation of the respective causal powers in the object and the perceiver that comprises this causal interaction, which grounds the perceiver's experience on the one hand, and the object's sounding, coloring, etc., on the other. For Aristotle, the perceiver is the means for the fullest activation of the perceptible properties of objects in the world—which are activated as properties of objects rather than as experiences of perceivers. This is Aristotle's subtle realist view of perception. It shows that (and in what way) the perceptual input we gather about a colorful, noisy, etc. world is veridical.

Our only means for perceiving the world are the five senses, each individuated by the type of perceptible qualities it is sensitive to: colors for sight, sounds for hearing, etc. Is our perceptual grasp of the world limited to only one perceptible quality per perceptual content at a time, or even to several such contents from

the disparate senses? If this were the case, we would not perceive objects, or discriminate their qualities; but we do perceive objects and discriminate their qualities. So how is it that we can become aware of perceptual content comprising more than isolated perceptible qualities at a time? How is complex perceptual content realized?

Aristotle was the first to investigate these questions to a depth that makes his account fruitful even for contemporary philosophy, but also challenging. He addressed them by means of the metaphysical modeling of the unity of the perceptual faculty and of experiential content. In this book I reconstruct the six metaphysical models offered by Aristotle to address these and related questions, focusing on their metaphysical underpinning in his theory of causal powers. By doing so, I bring out what is especially valuable and even surprising about the topic: Aristotle's metaphysics of perception is fundamentally different from his metaphysics of substance—which has received so much attention in the last forty years, generating a neo-Aristotelian movement in metaphysics.

For generations scholars attempted to fit Aristotle's metaphysics of perception to his metaphysics of substance. Yet, for precisely this reason, his models of complex perceptual content are unexplored territory. This book charts the new territory: it offers an understanding of Aristotle's metaphysics of the content of perceptual experience and of the faculty of perception; it aims at systematizing them—explicating and exploring them—and at bringing out the metaphysical breakthroughs Aristotle achieved. The book also makes a scholarly contribution to the field in that it brings textual evidence to bear on the most recent work on this topic.

The Metaphysical Foundations of Perception

INTRODUCTION

One of the cornerstones of Aristotle's theory of perception is that the world is truly as colorful as it looks to us, as noisy as it sounds to us, etc. By generalization, Aristotle holds that we perceive the world through the senses *as it is*; in other words, the contents of our perceptions are just like the real properties of the external objects we perceive.[1] While there is scholarly consensus on Aristotle's realism with respect to perceptible qualities, a variety of ways of interpreting it have been put forward in the literature. This book makes an original contribution to the debate by motivating the view that Aristotle's theory of perception is aligned with one of his most fundamental positions in metaphysics, namely that all properties are causal powers (δυνάμεις, potentialities), and that causation is to be accounted for in terms of powers and their activation (ἐν ἐνεργείᾳ or ἐνεργείᾳ, actuality).[2] Thus, in the case of perception the perceptible qualities of objects are real powers of the object to interact causally with the perceivers, and perception itself is the activation of the relevant powers in the perceiver by the objects of perception. The activation of the object's perceptible qualities and the activity of the corresponding perceptual experience in the agent are mutually

dependent in a variety of ways, which are unique to Aristotle's perceptual realism.

Before exploring this view in more detail, it will be helpful to briefly introduce the key terms that will be relevant for the following discussion. The Aristotelian scholar might indeed already be surprised by my use of the terms 'power' for 'potentiality' on the one hand, and 'activation' for 'actuality' on the other. These are interpretative choices, and in some ways departures from the received tradition; I will explain them presently. The Greek term δύναμις, as Aristotle uses it, refers to a property whose nature is defined in terms of the change it can bring about, or which it can allow its bearer to suffer. The most common English translation of δύναμις thus understood is 'potentiality'. This translation, albeit well established, is unhelpful when we embark on an investigation of Aristotle's views, for three main reasons. Firstly, it blurs the conceptual distinction between the property itself, that is, the causal power, and the state it is in, because they both end up being referred to as 'potentiality'. Secondly, it obscures the relevance of Aristotle's view to contemporary metaphysics: the term 'potentiality' does not figure in the contemporary discourse, although what it refers to in Aristotle is very much at the center of current discussion in metaphysics.[3] Thirdly, it generates unnecessary difficulties for our understanding of what an activated power is. I thus propose to use the term 'power' as a translation of δύναμις when it refers to causal powers, and to use the term 'potentiality' when referring to the state that causal powers are in when not activated.

Some powers, for Aristotle, exist in nature ἐν δυνάμει or δυνάμει and others ἐν ἐνεργείᾳ or ἐνεργείᾳ. For these expressions I use the current translation 'in potentiality' or 'potentially', and 'in actuality' or 'actually', respectively. While keeping to the standard translation, I offer however an original interpretation of what it is for a power to be in actuality. I argue that the actuality of a power is to

be interpreted as its *state of activation*; its exercis*ing* powerfulness. For Aristotle, a power does not cease to be powerful while activated, nor is its powerfulness reducible to mere potentiality, as we will see in more detail later. The powerfulness of a power is either the potentiality to bring about change, or the actuality of bringing about change. That the powerfulness and the potentiality of a power are not reducible one to the other can be derived from the following stance Aristotle takes. He differentiates three states a subject *s* may be in in relation to a power: *s* may have a power in potentiality (as in the case of a child having the power to learn to play soccer); *s* may have a power in first actuality (when the child has learned to play soccer); and *s* may have a power in second actuality (when the child is playing soccer).[4] For Aristotle some powers retain their potentiality only up to the state of first actuality, but not in second actuality. For example, when water is freezing and becoming an ice cube, in the first stages of this process the ice cube in the making is not actually fragile but can acquire the capacity to break if it cooled down more. When it is cooled down more the ice cube becomes harder and brittle, and can potentially break (e.g. by being crushed). Crushing it activates its brittleness, namely its power to break. When the ice cube is actively breaking it loses the potentiality to break. By contrast, other powers retain their potentiality when in second actuality; for instance, the child's potentiality to play soccer is preserved while playing soccer, namely while the power is activated. Aristotle explains:

> Even the term 'being acted upon' is not used in a single sense, but sometimes it means a kind of destruction of something by its contrary, and sometimes rather a preservation of that which is potential by something actual which is like it, as potency is related to actuality. For when the one merely possessing knowledge comes to exercise it, he is not altered (for the development

is into his real self or actuality), or else this is a different kind of alteration (*DA* 417b2–7)

οὐκ ἔστι δ' ἁπλοῦν οὐδὲ τὸ πάσχειν, ἀλλὰ τὸ μὲν φθορά τις ὑπὸ τοῦ ἐναντίου, τὸ δὲ σωτηρία μᾶλλον τοῦ δυνάμει ὄντος ὑπὸ τοῦ ἐντελεχείᾳ ὄντος, καὶ ὁμοίου οὕτως ὡς δύναμις ἔχει πρὸς ἐντελέχειαν· θεωροῦν γὰρ γίνεται τὸ ἔχον τὴν ἐπιστήμην, ὅπερ ἢ οὐκ ἔστιν ἀλλοιοῦσθαι (εἰς αὑτὸ γὰρ ἡ ἐπίδοσις καὶ εἰς ἐντελέχειαν) ἢ ἕτερον γένος ἀλλοιώσεως.

A power is powerful because of its relation to change—it can lead to change, or it engages in change that preserves it.[5]

1.1 ARISTOTLE'S POWER ONTOLOGY

Aristotle's power ontology, as briefly sketched thus far, bears on his theory of perception. For him, the perceptible qualities that characterize the world around us are *real causal powers* objects have, as we will see in the next chapters. Why are powers so central to Aristotle's metaphysics, and consequently to all domains of his investigation, including perception? How did he reach this view? Aristotle aims at a rational explanation of the world all the way down to the bedrock of reality. In the *De Generatione et Corruptione* he states that at this fundamental level of reality there are properties and bodies, and there is a rationale to the number of bodies and the way the properties are distributed among them. He writes,

> The [fundamental] differences [i.e., properties] are *reasonably* distributed among the primary bodies, and the number of the latter is *consonant with theory*. (*GC* 330b6–7, my emphasis)
>
> εὐλόγως διανέμεσθαι τὰς διαφορὰς τοῖς πρώτοις σώμασι, καὶ τὸ πλῆθος αὐτῶν εἶναι κατὰ λόγον.

In thinking about the properties that characterize the primary bodies, Aristotle narrows down the candidates for this role of fundamental property to the *tangible contrarieties* (*GC* 329b6–9), which for him are:

> [Properties]…capable of acting [and] being affected…said of things in virtue of their acting upon something else or being acted upon by something else. (*GC* 329b21–22)
> … ποιητικὰ…παθητικά…τῷ ποιεῖν τι ἕτερον ἢ πάσχειν ὑφ᾽ ἑτέρου λέγονται.

Clearly then for Aristotle these properties are *powers*: they are properties whose nature is to bring about or allow their bearer to suffer change. Aristotle goes through an analysis of the list of tangible contrarieties, and concludes that they are all reducible to four primary or fundamental ones. These primary powers are heat, cold, wetness, and dryness:

> It is clear…that all the other differences reduce to the first four, but that these admit of no further reduction…Hence these must be four. (*GC* 330a24–29)
> Δῆλον…ὅτι πᾶσαι αἱ ἄλλαι διαφοραὶ ἀνάγονται εἰς τὰς πρώτας τέτταρας. Αὗται δὲ οὐκέτι εἰς ἐλάττους…ὥστ᾽ ἀνάγκη τέτταρας εἶναι ταύτας.

These primary powers do not exist separately each on its own; they pair up and constitute the *four simple elements*: namely fire, air, water, and earth:

> Fire is hot and dry, whereas Air is hot and moist…and Water is cold and wet, while Earth is cold and dry. (*GC* 330b3–5)
> τὸ μὲν γὰρ πῦρ θερμὸν καὶ ξηρόν, ὁ δ᾽ ἀὴρ θερμὸν καὶ ὑγρόν…τὸ δ᾽ ὕδωρ ψυχρὸν καὶ ὑγρόν, ἡ δὲ γῆ ψυχρὸν καὶ ξηρόν.

Aristotle holds that there are no other primary properties that any of the simple elements possesses in addition to the two contrary powers each simple element is qualified by. The simple elements can reciprocally transform into one another by gaining or losing their powers.[6] For example the simple elements water and fire have two contrarieties each, and when they come in contact the interaction between them results in the heat of fire overpowering the coldness of the water while the wetness of water overpowers the dryness of fire, giving rise to what is hot and wet, namely air. And when air loses its primary power of heat, which is replaced by the power of cold, it transforms into water again. Aristotle writes:

> For these bodies [Fire, Water and the like] change into one another (they are not immutable as Empedocles and other thinkers assert, since alteration would then have been impossible), whereas the *contrarieties do not change*. (GC 329a35–b3, my emphasis)
>
> ταῦτα μὲν γὰρ μεταβάλλει εἰς ἄλληλα, καὶ οὐχ ὡς Ἐμπεδοκλῆς καὶ ἕτεροι λέγουσιν (οὐδὲ γὰρ ἂν ἦν ἀλλοίωσις), αἱ δ' ἐναντιώσεις οὐ μεταβάλλουσιν.
>
> There will be Air, when the cold of the Water and the dry of the Fire have passed away (since the hot of the latter and the moist of the former are left); whereas, when the hot of the Fire and the moist of the Water have passed-away, there will be Earth, owing to the survival of the dry of the Fire and the cold of the Water. So, too, in the same way Fire and Water will result from Air and Earth. For there will be Water, when the hot of the Air and the dry of the Earth have passed-away (since the moist of the former and the cold of the latter are left); whereas, when the moist of the Air and the cold of the Earth have passed-away, there will be Fire, owing to the survival of the hot of the Air

and the dry of the Earth—qualities constitutive of Fire. (*GC* 331b14–24)

Ὅταν μὲν γὰρ τοῦ ὕδατος φθαρῇ τὸ ψυχρὸν τοῦ δὲ πυρὸς τὸ ξηρόν, ἀὴρ ἔσται (λείπεται γὰρ τοῦ μὲν τὸ θερμὸν τοῦ δὲ τὸ ὑγρόν), ὅταν δὲ τοῦ μὲν πυρὸς τὸ θερμὸν τοῦ δ' ὕδατος τὸ ὑγρόν, γῆ, διὰ τὸ λείπεσθαι τοῦ μὲν τὸ ξηρὸν τοῦ δὲ τὸ ψυχρόν. ὡσαύτως δὲ καὶ ἐξ ἀέρος καὶ γῆς πῦρ καὶ ὕδωρ· ὅταν μὲν γὰρ τοῦ ἀέρος φθαρῇ τὸ θερμὸν τῆς δὲ γῆς τὸ ξηρόν, ὕδωρ ἔσται (λείπεται γὰρ τοῦ μὲν τὸ ὑγρὸν τῆς δὲ τὸ ψυχρόν), ὅταν δὲ τοῦ μὲν ἀέρος τὸ ὑγρὸν τῆς δὲ γῆς τὸ ψυχρόν, πῦρ, διὰ τὸ λείπεσθαι τοῦ μὲν τὸ θερμὸν τῆς δὲ τὸ ξηρόν, ἅπερ ἦν πυρός.

The simple elements can combine between them in different proportions to make up more complex kinds of stuff. Thus the (instantiated) primary powers are the primitive (or basic) and fundamental building blocks of reality. The primary powers are primitive because they are not constituted of any further items as their building blocks. There are no items constituting the primary properties, and therefore there are no further items constituting the simple elements—air, water, earth, and fire—apart from their primary powers. On the other hand, they are fundamental because the primary properties, to which the other properties are reducible,[7] interact with each other in the cyclical transformations of the primary elements they constitute,[8] thereby making up a structure of interacting powers that is the foundation of all there is in nature. In view of the fact that for Aristotle everything in physical nature is built out of the four simple elements and their mixtures, and the simple elements are built out of the primary properties, it follows that all there is in nature is built out of *powers*. All physical changes in nature derive from changes in the combinations of the primary powers. Since, on Aristotle's view, powers require other powers to activate them, this gives rise to a net of interdependent powers,

which, ultimately, constitute everything in nature. It is a structure of dependences, not of relations between powers. Nor is it a structure of relations that constitute powers; dependence does not introduce relations or make powers relational entities in their constitution. Furthermore, as we shall see, for Aristotle the manifestation of each power is intrinsic to the power itself. Being activated is simply exercising the powerfulness that defines what the power is.[9]

1.2 THE NATURE OF CAUSAL POWERS

In general terms, for Aristotle, a power is first and foremost the capacity to *bring about change*:

All potentialities that conform to the same type are *starting points* of some kind, and are called *potentialities* in reference to one primary kind, which is a starting point of *change* in another thing or in the thing itself *qua* other. (*Met.* 1046a9–11, my emphasis)[10]

ὅσαι δὲ πρὸς τὸ αὐτὸ εἶδος, πᾶσαι ἀρχαί τινές εἰσι, καὶ πρὸς πρώτην μίαν λέγονται, ἥ ἐστιν ἀρχὴ μεταβολῆς ἐν ἄλλῳ ἢ ᾗ ἄλλο.

It is important to note from the start that Aristotle's very explanation of powers as being sources of change, and nothing other than that, commits him, albeit implicitly, to the view that all there is to a power is what it can do, or is doing. Nothing inert or impotent is needed in the power's nature to anchor the power to reality.[11] This commitment (which is shared by a number of contemporary power metaphysicians)[12] is not uncontroversial;[13] however, it is crucial to free Aristotle's power ontology from any of the regresses that ensue for other power ontologies, as we will see later.

In addition to the primary type of powers just mentioned, that is the *active* ones which can initiate change, for Aristotle there exist *passive* powers that are capacities to suffer change:

> For one kind is a potentiality for being acted on (i.e., the principle in the very thing acted on) which makes it capable of being changed and acted on by another thing or by itself regarded as other. (*Met.* 1046a11–13)
>
> ἡ μὲν γὰρ τοῦ παθεῖν ἐστὶ δύναμις, ἡ ἐν αὐτῷ τῷ πάσχοντι ἀρχὴ μεταβολῆς παθητικῆς ὑπ᾽ ἄλλου ἢ ᾗ ἄλλο.

Examples of such capacities or powers are, for example, fragility, or malleability, or flexibility, etc. For Aristotle being able to change is as much a capacity or power as being able to effect change, as he states:

> In a sense the potentiality of acting and of being acted on is one (for a thing may be capable either because it can be acted on or because something else can be acted on by it), but in a sense the potentialities are different. For the one is in the thing acted on; it is because it contains a certain motive principle, and because even the matter is a motive principle, that the thing acted on is acted on... for that which is oily is inflammable; and that which yields in a particular way can be crushed; and similarly in all other cases. But the other potency is in the agent (e.g. heat and the art of building are present, one in that which can produce heat and the other in the man who can build). (*Met.* 1046a19–28)
>
> φανερὸν οὖν ὅτι ἔστι μὲν ὡς μία δύναμις τοῦ ποιεῖν καὶ πάσχειν (δυνατὸν γάρ ἐστι καὶ τῷ ἔχειν αὐτὸ δύναμιν τοῦ παθεῖν καὶ τῷ ἄλλο ὑπ᾽ αὐτοῦ), ἔστι δὲ ὡς ἄλλη. ἡ μὲν γὰρ ἐν τῷ πάσχοντι (διὰ γὰρ τὸ ἔχειν τινὰ ἀρχήν, καὶ εἶναι καὶ τὴν ὕλην ἀρχήν τινα,

πάσχει τὸ πάσχον…τὸ λιπαρὸν μὲν γὰρ καυστὸν τὸ δ' ὑπεῖκον
ὡδὶ θλαστόν, ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων), ἡ δ' ἐν τῷ ποιοῦντι,
οἶον τὸ θερμὸν καὶ ἡ οἰκοδομική, ἡ μὲν ἐν τῷ θερμαντικῷ ἡ δ' ἐν
τῷ οἰκοδομικῷ·

A notion that is distinctive to Aristotle's account is conceiving of
passive powers as *originative sources of change* (see *Met.* 1046a11–13;
a23). It is natural for us to think that an originative source of change
is a power to *bring about* change; but it is not as natural to think
that an originative source of change is a capacity to *suffer* change.
Yet Aristotle sees both active and passive powers as originative
sources of change, the one as a source that changes something, and
the other as a source of suffering change. In fact, Aristotle gives sev-
eral examples of originative sources of suffering change to make his
point clear, such as, for example, oil or brittle matter.[14] Both active
and passive powers are mentioned in Aristotle's definition of power
in *Met.* V 12:

> Things which are called capable (δυνατόν) in one sense will be
> those which originate change or alteration…in other things or
> *qua* other; in another sense, if something else possesses such
> capacity over them. (*Met.* 1019a33–b1)
>   καὶ τὸ δυνατὸν ἕνα μὲν τρόπον λεχθήσεται τὸ ἔχον κινήσεως
> ἀρχὴν ἢ μεταβολῆς…ἐν ἑτέρῳ ἢ ᾗ ἕτερον, ἕνα δ' ἐὰν ἔχῃ τι
> αὐτοῦ ἄλλο δύναμιν τοιαύτην.

The former is the primary case for Aristotle; 'the others are called
capable either from something else's possessing a capability of that
kind over them, or from its not possessing it, or from its possessing
it in a particular way' (*Met.* 1020a2–4).

As I will argue below, it is a fundamental tenet for Aristotle that
powers are *dependent on other powers* in order to be activated. For

example the solubility of salt requires salt to be placed in an appropriate liquid in order for it to dissolve. The position was first put forward by Heraclitus, endorsed by Plato,[15] and then developed by Aristotle; interestingly it is gaining consensus among contemporary metaphysicians too.[16] But it is a distinctive Aristotelian view (and far from being a point of consensus among contemporary power metaphysicians) that *active* powers depend on *passive* powers for their activation (and vice versa). Aristotle defines an active power as one that exercises its powerfulness on a corresponding passive one.[17] As I will argue below, the distinction between active and passive powers is pivotal for a sound account of causation, for it gives metaphysical underpinning to its asymmetry.[18]

1.3 CAUSAL POWERS IN ACTUALITY

Powers are capacities for change; the change is the end (τέλος) they are directed toward.[19] For a power, reaching its end is exercising its powerfulness, and thereby becoming actual. Most importantly, for Aristotle the actuality of a power is its *activation*, namely a transition to a different *status* of the power itself.[20] This new stage reached by the activated power is the causal *activity* the power is engaged in. For example, the power to heat when activated is heat*ing* something else. Aristotle in fact distinguishes between powers whose activation is an *activity* in the strict sense (ἐνέργεια, πρᾶξις), and others whose activation is a *process* (κίνησις). The powers whose ends are activities are realized instantaneously, such as in the case of the power to see; at any one moment one sees and has seen. The powers whose ends are processes are realized in stages, such as in the case of the power to build a house; while one is building a house, one has not built a house. Processes have a natural completion point: when the end of the process is reached, such as the completion of the

house; activities do not have a natural completion point (e.g., in the case of seeing). Strictly speaking Aristotle associates *change* with *processes* only, because in the case of processes the resulting state is qualitatively different from the initial state—as for instance in the case of heating (process), but not of seeing (activity).[21] To make Aristotle's point even clearer we might say that processes only have an output, while both processes and activities have an effect. Aristotle's distinctions are mainly presented in the following text from the *Metaphysics*:

> Since of the actions which have a limit none is an end but all are relative to the end (e.g., the process of making thin is of this sort) and the things themselves when one is making them thin are in movement in this way (i.e., without being already that at which the movement aims), this is not an action or at least not a complete one (for it is not an end); but that in which the end is present is an action. For example, at the same time we are seeing and have seen, are understanding and have understood, are thinking and have thought: but it is not true that at the same time we are learning and have learned, or are being cured and have been cured. At the same time we are living well and have lived well, and are happy and have been happy. If not, the process would have had sometime to cease, as the process of making thin ceases: but, as it is, it does not cease: we are living and have lived. Of these processes, then, we must call the one set movements (κινήσεις), and the other actualities (ἐνεργείας). For every movement is incomplete—making thin, learning, walking, building—these are movements, and incomplete movements. For it is not true that at the same time we are walking [to a destination] and have walked [to the destination], or are building and have built, or are coming to be and have come to be—it is a different thing that is being moved

and that has been moved, and that is moving [to a location] and that has moved; but it is the same thing that at the same time has seen and is seeing, or is thinking and has thought. The latter sort of process, then, I call an actuality (ἐνέργεια), and the former a movement (κίνησις). What, and what kind of thing, the actual is, may be taken as explained by these and similar considerations. (*Met.* 1048b18–36)

 Ἐπεὶ δὲ τῶν πράξεων ὧν ἔστι πέρας οὐδεμία τέλος ἀλλὰ τῶν περὶ τὸ τέλος, οἷον τὸ ἰσχναίνειν [ἢ ἰσχνασία] [αὐτό], αὐτὰ δὲ ὅταν ἰσχναίνῃ οὕτως ἐστὶν ἐν κινήσει, μὴ ὑπάρχοντα ὧν ἕνεκα ἡ κίνησις, οὐκ ἔστι ταῦτα πρᾶξις ἢ οὐ τελεία γε· οὐ γὰρ τέλος· ἀλλ᾽ ἐκείνη <ᾗ> ἐνυπάρχει τὸ τέλος καὶ [ἡ] πρᾶξις. οἷον ὁρᾷ ἅμα <καὶ ἑώρακε,> καὶ φρονεῖ <καὶ πεφρόνηκε,> καὶ νοεῖ καὶ νενόηκεν, ἀλλ᾽ οὐ μανθάνει καὶ μεμάθηκεν οὐδ᾽ ὑγιάζεται καὶ ὑγίασται. εὖ ζῇ καὶ εὖ ἔζηκεν ἅμα, καὶ εὐδαιμονεῖ καὶ εὐδαιμόνηκεν. εἰ δὲ μή, ἔδει ἄν ποτε παύεσθαι ὥσπερ ὅταν ἰσχναίνῃ, νῦν δ᾽ οὔ, ἀλλὰ ζῇ καὶ ἔζηκεν. τούτων δὴ <δεῖ> τὰς μὲν κινήσεις λέγειν, τὰς δ᾽ ἐνεργείας. πᾶσα γὰρ κίνησις ἀτελής, ἰσχνασία μάθησις βάδισις οἰκοδόμησις· αὗται δὴ κινήσεις, καὶ ἀτελεῖς γε. οὐ γὰρ ἅμα βαδίζει καὶ βεβάδικεν, οὐδ᾽ οἰκοδομεῖ καὶ ᾠκοδόμηκεν, οὐδὲ γίγνεται καὶ γέγονεν ἢ κινεῖται καὶ κεκίνηται, ἀλλ᾽ ἕτερον [καὶ κινεῖ καὶ κεκίνηκεν]· ἑώρακε δὲ καὶ ὁρᾷ ἅμα τὸ αὐτό, καὶ νοεῖ καὶ νενόηκεν. τὴν μὲν οὖν τοιαύτην ἐνέργειαν λέγω, ἐκείνην δὲ κίνησιν. τὸ μὲν οὖν ἐνεργείᾳ τί τέ ἐστι καὶ ποῖον, ἐκ τούτων καὶ τῶν τοιούτων δῆλον ἡμῖν ἔστω.

From the above text we learn that powers are actualized, according to Aristotle, as either activities or processes. The difference between them is that processes have a beginning and an end which are different from each other, so completing the realization of the end requires qualitatively different stages in a process; while in an activity the beginning and the end are the same, in a

continuous realization of the end. Since while a process is taking place it has not reached its end point yet, it can be thought of as a power in the process of being actualized, which is how Aristotle thinks about it. A process is an actuality, because the unfolding realization of its different stages is happening; but at the same time it is not fully realized, in so far as it has not reached its end yet. In that sense a change is an *actual* process in progress, realizing its remaining *potential* stages, as Aristotle explains in the *Physics*:

> The *actuality* of the potential, *qua* potential, is change (e.g., the actuality of what is alterable as alterable, is alteration; of what is increasable and its opposite, decreasable (there is no common name for both), increase and decrease; of what can come to be and can pass away, coming to be and passing away; of what can be carried along, locomotion). That this is what change is, is clear from what follows: when what is buildable, in so far as we call it such, is in fulfillment, it is being built, and that is building. (*Phys.* 201a9–18, transl. slightly modified)
>
> ἡ τοῦ δυνάμει ὄντος ἐντελέχεια, ᾗ τοιοῦτον, κίνησίς ἐστιν, οἷον τοῦ μὲν ἀλλοιωτοῦ, ᾗ ἀλλοιωτόν, ἀλλοίωσις, τοῦ δὲ αὐξητοῦ καὶ τοῦ ἀντικειμένου φθιτοῦ (οὐδὲν γὰρ ὄνομα κοινὸν ἐπ᾽ ἀμφοῖν) αὔξησις καὶ φθίσις, τοῦ δὲ γενητοῦ καὶ φθαρτοῦ γένεσις καὶ φθορά, τοῦ δὲ φορητοῦ φορά. ὅτι δὲ τοῦτο ἔστιν ἡ κίνησις, ἐντεῦθεν δῆλον. ὅταν γὰρ τὸ οἰκοδομητόν, ᾗ τοιοῦτον αὐτὸ λέγομεν εἶναι, ἐντελεχείᾳ ᾖ, οἰκοδομεῖται, καὶ ἔστιν τοῦτο οἰκοδόμησις·

Some confusion might arise in reading the passage: it might appear that a power is potential before it is actualized, and again potential after it is actualized, as if there were unactualized and actualized

potential. To avoid confusion it is important to bear in mind the distinction drawn by Aristotle between the *activation* of a power—that is, its realization—and the *completion* of the process of its realization. Thus, the power of house building becomes *actual* when *activated* at the beginning of the house-building process, and *continues to be in actuality* until all the stages of house building are completed. Although in activities the end is reached as soon as the activity occurs, and sets no limits to the duration of the activity, in the case of changes the end is complex; the process has to be initiated and continue activated until the end point of the process is reached, completing the process:

> While in some cases the exercise is the ultimate thing (e.g., in sight the ultimate thing is seeing, and no other product besides this results from sight), but from some things a product follows (e.g., from the art of building there results a house as well as the act of building), yet none the less the act [of seeing] is in the former case the end and in the latter [the act of house building is] more of an end than the mere potentiality [to build] is [even if it is less of an end than the completion of the house]. (*Met.* 1050a23–28)
>
> ἐπεὶ δ’ ἐστὶ τῶν μὲν ἔσχατον ἡ χρῆσις (οἷον ὄψεως ἡ ὅρασις, καὶ οὐθὲν γίγνεται παρὰ ταύτην ἕτερον ἀπὸ τῆς ὄψεως), ἀπ’ ἐνίων δὲ γίγνεταί τι (οἷον ἀπὸ τῆς οἰκοδομικῆς οἰκία παρὰ τὴν οἰκοδόμησιν), ὅμως οὐθὲν ἧττον ἔνθα μὲν τέλος, ἔνθα δὲ μᾶλλον τέλος τῆς δυνάμεώς ἐστιν·

The contrast is between the potentiality for building a house when nothing is being built, and the potentiality for building a house while a house is being built. The latter potentiality is the activation of the former potentiality, and has an end point that marks its full actualization. This is what the actuality of the potential *qua*

potential is—the actual process of building the house. During the building process, the power to build is *as activated* (and *as actual*) as is the power to see when one is seeing. Thus, when the power is actively doing what it is in its own nature capable of doing, then the power is actualized. Prior to this it exists but in a potential state. Thus the *actuality* of a power, whether for an activity or a process, is the *activation* of that power:[22]

> That which is in the primary sense potential is potential because it is possible for it to become actual (e.g., I mean by 'capable of building' that which can build, and by 'capable of seeing' that which can see). (*Met.* 1049b12–16)
>
> τῷ λόγῳ μὲν οὖν ὅτι προτέρα, δῆλον (τῷ γὰρ ἐνδέχεσθαι ἐνεργῆσαι δυνατόν ἐστι τὸ πρώτως δυνατόν, οἷον λέγω οἰκοδομικὸν τὸ δυνάμενον οἰκοδομεῖν, καὶ ὁρατικὸν τὸ ὁρᾶν, καὶ ὁρατὸν τὸ δυνατὸν ὁρᾶσθαι·

Aristotle further distinguishes the *activation* of a power from the *realization* of the power's end. The end of a power is given in the power's definition:

> That which is capable is capable of something and at some time in some way—with all the other qualifications which must be present in the definition. (*Met.* 1047b35–1048a2)
>
> ἐπεὶ δὲ τὸ δυνατὸν τὶ δυνατὸν καὶ ποτὲ καὶ πῶς καὶ ὅσα ἄλλα ἀνάγκη προσεῖναι ἐν τῷ διορισμῷ.

As mentioned above, for Aristotle, the actuality of a power is *not* a new property that comes about.[23] Rather, it is the activation of the power, either as it is exercising its causal influence on the passive power or as the passive power is suffering that influence. For example, if a peach has the power to ripen in the heat, the ripening is the actualization

of active and passive powers at play in the environment and in the peach. The ripe state of the peach that comes about is the aftermath of the activation of the powers, not their manifestation, which is the ripening process. Similarly, in the case of a builder who has the power to build a house, the built house is the output of the activation of the active and passive powers in play in the circumstances.

For Aristotle a power in potentiality is *the same power* as that power in actuality (i.e., when it is activated). In other words, the difference between potential and actual power is *not a numerical difference*. This is a very important and distinctive tenet of Aristotle's metaphysics, whose philosophical soundness shows up clearly if we consider it in relation to three debates in the recent literature on power metaphysics. In brief, these issues are: firstly, whether pure power ontologies of the kind Aristotle endorses (where there is nothing categorical anchoring the powers to reality) are committed to a world of mere potentiality; secondly, whether powers have an essentially relational nature; and thirdly, in what sense a power's directedness toward its manifestation is intrinsic to the power itself. I shall now examine each of these debates, showing in each case how Aristotle's view makes a fresh contribution, and advances the contemporary debate.

To begin with, is Aristotle's account vulnerable to the criticism that all there is or can be is potential, and that change is simply a transition from one potential state of the world to another such state? This is a problem faced by many contemporary power ontologies, sometimes referred to as the "Always packing, never travelling" problem.[24] David Armstrong formulates the problem thus:

> Given purely dispositionalist accounts of properties, particulars would seem to be always repacking their bags as they change properties, yet never taking a journey from potency to act. (1997, 80)

The problem stems from the position held by contemporary power ontologists whereby the manifestation of a power is *a new* power.[25] This position commits them to a network of powers in potentiality, as the activation of each power in potentiality is a transition to *a new* power in potentiality. Thus, nothing ever seems to be actualized. Avoiding a commitment to worlds of mere potentiality is precisely the worry that Aristotle's position avoids. On his view, and in contrast to alternative views in the contemporary literature, the transition a power makes from being in potentiality to being in actuality does not amount to bringing about *another* power in potentiality. It is rather a transition the power makes to *its own* activated state. An activated power is the very same power as the power in potentiality, but is now manifest*ing* (e.g., the power to heat actively heat*ing* something). A theory of powers that did not allow them when activated to exercise their powerfulness would be rather odd indeed. For Aristotle powers that are exercising their powerfulness are actively bringing about change, and result in a new configuration of powers. But the exercise of powerfulness is not the result, but rather the process toward the result. From this discussion it follows that for Aristotle the powerfulness of a power is not reducible to mere potentiality. (This addresses the first of the three issues in contemporary metaphysical debate mentioned above). Powerfulness is the potentiality to bring about or suffer change, but also the activity of bringing about or suffering change. Additionally, the activation of a power is neither the end of that power, nor does it render the power inert. On the contrary, the power is actively being powerful by engendering change or suffering change.

Thus, the relation between a power and its actuality is *intrinsic* to the power itself, in the way that, for example, the relation of a girl to the woman she becomes is intrinsic to that person.[26] It is a common assumption, after Aristotle, that powers are defined in terms of their actuality. Contemporary power ontologies take the manifestation of a power to be a further power, thereby establishing